Commodity Modelling in an Enlarged Europe

November 2006 Workshop Proceedings
AGMEMOD Report V

Editors: Lubica Bartova, Robert M'barek
The mission of the IPTS is to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic and a scientific or technological dimension.
■ Foreword

Quantitative models are important tools to analyse the impact of agricultural policies. Validated projections and scenario analysis are crucial for policy makers in the context of EU enlargement, the ongoing Common Agricultural Policy reform and dynamic agricultural commodity markets.

The European Commission's Joint Research Centre - Institute for Prospective Technological Studies (JRC-IPTS) and DG AGRI jointly organised a workshop on "Commodity Modelling in an Enlarged Europe" which was held in November 2006 at the JRC-IPTS venue in Seville. The main objective of the workshop was to validate the results of a JRC-IPTS study "Impact Analysis of CAP reform on the main agricultural commodities" on projections of agricultural commodity markets with modellers and national experts, in particular from the new Member States (2004 and 2007 EU enlargements), and to discuss model scenarios with policy-makers from respective Commission Services.

The above mentioned study has been carried out by the AGMEMOD Partnership under the management of the Agricultural Economics Research Institute (LEI, the Netherlands), in cooperation with the JRC-IPTS.
AGMEMOD (AGricultural MEember states MODelling) is an econometric, dynamic, partial equilibrium, multi-country, multi-market modelling system, which provides detailed information on the agricultural sector in each EU Member State and the EU as a whole.

During this study the model has been improved, projections have been made for the main European agricultural commodity markets from 2005 until 2015 and the impact of selected policy scenarios assessed.

In addition to the AGMEMOD results, projections for commodity markets from other important models (FAPRI, ESIM, AGLINK and CAPSIM) were presented and discussed in the workshop. Furthermore, a tool for short term forecast and analysis was presented.

Valuable comments were given by modellers, policy makers and national experts on the strengths and weaknesses of the AGMEMOD modelling approach and on ways to improve the model.

Detailed documentation on the AGMEMOD modelling approach as well as the results of the study have been published in five reports within the JRC-IPTS Scientific and Technical Report Series (Box 1) under the heading "Impact analysis of CAP reform on the main agricultural commodities".
Box 1 Impact analysis of CAP reform on the main agricultural commodities

**Report I AGMEMOD – Summary Report**
This report presents the projections of agricultural commodity markets under the baseline, further CAP reform, enlargement scenarios and exchange rate change sensitivity analyses for the aggregates EU-10, EU-15, EU-25 and EU-27. It summarises the characteristics of the modelling tool used, focusing in particular on the features implemented in this study, and addresses issues that need further attention. (http://www.jrc.es/publications)

**Report II AGMEMOD – Member States Results**
This report outlines the results of the baseline projections of agricultural commodity markets, further CAP reform scenario impact analyses and exchange rate change sensitivity analyses for individual EU-27 Member States except Malta and Cyprus. For Bulgaria and Romania enlargement and non-enlargement scenarios are analysed. (http://www.jrc.es/publications)

**Report III AGMEMOD – Model Description**
This report describes the modelling techniques used by the AGMEMOD Partnership, with emphasis on new commodities modelled and policy modelling approaches. (http://www.jrc.es/publications)

**Report IV AGMEMOD – GSE Interface Manual**
The manual gives an overview of the GAMS Simulation Environment (GSE) interface and its application with the AGMEMOD model. (http://www.jrc.es/publications)

**Report V Commodity Modelling in an Enlarged Europe – November 2006 Workshop Proceedings**
These proceedings include presentations and conclusions of a workshop held in November 2006. Presentations of the results of other models such as FAPRI, ESIM, AGLINK and CAPSIM are introduced in addition to the AGMEMOD approach. (http://www.jrc.es/publications)

We acknowledge contributions made by all those who participated at the workshop.
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Acronyms

AGMEMOD: AGricultural MEember states MODelling
AGMEMOD 2020: The EU 6th Framework Programme project
CAP: Common Agricultural Policy
CEECs: Central and Eastern European Countries
CNDP: Complementary National Direct Payments (top-ups)
EU-10: 8 EU Member States of 2004 enlargement, Malta and Cyprus not included
EU-15: 15 EU Member States before 2004 enlargement
EU-25: 23 EU Member States after 2004 enlargement, Malta and Cyprus not included
EU-27: 25 EU Member States after 2007 enlargement, Malta and Cyprus not included
FAPRI: Food and Agricultural Policy Research Institute, USA
GAMS: General Algebraic Modelling System
GDP: Gross Domestic Product
GSE: GAMS Simulation Environment
JRC-IPTS: Joint Research Centre - Institute for Prospective Technological Studies (Spain)
OECD: Organisation for Economic Co-operation and Development
PSE: Producer Support Estimate
SAPS: Single Area Payment Scheme
SFP: Single Farm Payment
USD: U.S. Dollar
WTO: World Trade Organisation
1. R. M’barek - L. Bartova (European Commission, JRC – IPTS): Commodity Modelling in an Enlarged Europe

Workshop on commodity modelling, DG JRC, Seville, 6.11.2006

Background of workshop

- Commodity markets in a dynamic development
  - “Old” driving factors: weather, emerging countries, exchange rate, policy (WTO, US farm bill, EU health check)
  - “New” driving factors: biofuel, ethanol
  - Developments in new MS and CC

- Decision makers and economic agents in agriculture need information on commodity markets

- European Commission expands its own research capacities
JRC-IPTS support

- Model platform
  - To ensure that models financed under FP and developed for the EC are maintained, updated and used for policy relevant analysis
  - To ensure that successful pan-European networks, integrating particularly NMS, continue
- Complementary models: AGMEMOD, CAPRI, CGE, CAPSIM
- Possibilities and shortcomings of projections
  - Horizon of projections
  - Assumptions
  - Approaches: one model for one/all countries?

AGMEMOD project

- “Agro-food projections for the EU member states”
- Research project, funded by IPTS (Nov 05 – Jan 06)
- FP6 research project AGMEMOD 2020 (Jan 2006 – Dec 2008)
- Pan-European network, with strong NMS basis
- Bottom up approach, country expertise
- State of the art:
  - Country models now in GAMS code; combined model for EU15
  - Gams Simulation Environment as interface and quality control
  - Baseline until 2015 for EU25 MS, Bulgaria and Romania
  - Scenarios
Objectives of workshop

- Overview on current and expected developments on the European and global commodity markets
- Validation of projections of AGMEMOD project by country, commodity and modelling experts
- Crosscheck results with other models
- Discuss the possibilities and shortcomings of models
- Discuss natural sciences based approach
- Further development of AGMEMOD

Agenda

- Introduction: (Policy research in FP7, Background of workshop)
- Session 1: Agricultural commodity market prospective (FAPRI, USDA ERS, DG AGRI)
- Session 2: Modelling approaches and baseline results for EU 25/27 (AGLINK, AGLINK-COSIMO, ESIM, CAPSIM, AGMEMOD)
- Session 3: Commodity markets in detail EU25/27 (AGMEMOD) (Cereals/Oilseeds, Meat/Dairy)
- Session 4: Development of commodity markets in NMS/CC (AGMEMOD, ESIM, CAPSIM)
- Final discussion (Agrometeorological model; further development of AGMEMOD)

Policy Research in the
7th Research Framework Programme
(2007-2013)

Hans-Jörg Lutzeyer
Directorate E: Biotechnology, Agriculture and Food Research
DG Research - European Commission

Scientific support to policy (SSP) in FP 7

- Supports the formulation and implementation of Policies (CAP, CFP, Food Safety, Environment, others)
- Integrated into the Thematic Priorities
- No specific budget for SSP, competing with all other research opportunities in a Thematic Priority
- Part of a call for research proposals on a shared cost basis (no public procurement for services!)
- Research themes are targeted precisely to policy needs
Scientific support to policy (SSP) in FP 7

- Evaluation based on independent experts, their assessment alone decides on the ranking of proposals
- The highest scored projects will be funded, one ranking list for all topics
- How to deal adequately with multi-disciplinary projects?
- Commission negotiates the research projects based on expert comments and comments from the policy directorates (DG Agriculture, DG SANCO, DG Environment)

Cooperation – Collaborative research

<table>
<thead>
<tr>
<th>9 Thematic Priorities</th>
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<tbody>
<tr>
<td>1. Health</td>
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<td>3. Information and communication technologies</td>
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<tr>
<td>5. Security and space</td>
<td>2.858</td>
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</tbody>
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\[\text{+ Euratom: Fusion energy research, nuclear fission and radiation protection}\]
2. Food, Agriculture and Biotechnology

Sustainable production and management of biological resources from land, forest, and aquatic environments

“Fork to farm”: Food, health and well being

Life sciences and biotechnology for sustainable non-food products and processes

ACTIVITY 1: Sustainable production and management of biological resources from land, forest and aquatic environments

1. Enabling research for micro-organism, plants and animals

2. Sustainable, competitive and multifunctional agriculture, forestry, aquaculture and rural development

3. Animal welfare, breeding and production

4. Policy tools for agriculture and rural development
4. Policy tools for agriculture and rural development, some draft topics of the first call

- The Farm of Tomorrow – increasing the competitiveness through optimized processes and technologies, while addressing the multifunctional European farming model delivering public goods (Small collaborative project (SCA))

- GMO coexistence measures (SCA)

- Enlargement network – Agro-economic policy analysis of the accession and the candidate states and the countries of Western Balkan (Coordination and support action)

- Comparative analysis of factor markets for agriculture across the Member States (SCA)

4. Policy tools for agriculture and rural development, some topics of the first call

- Costs of different standard setting and certifications systems for organic food and farming (SCA)

- Drivers and limits of enhanced trade in agricultural and food products (SCA)

- Trade and agricultural policies – India (SCA)

- Assessing the impact of Rural Development policies (including Leader) (SCA)

- Policy and institutional aspects of sustainable agriculture and rural development in the Mediterranean partner countries (SCA)

- New sources of employment in rural areas (SCA)

- Costs of production using FADN data (SCA)
Roadmap and More information

Tentative Roadmap:
- publication of call: 22 Dec. 2006

CORDIS:
- www.cordis.lu/ General
- http://cordis.europa.eu.int/fp7/ FP7
- www.cordis.lu/food/ FP6 / Food
- www.cordis.lu/food/inco.htm FP6 / INCO and Food

EUROPA:
- http://europa.eu.int/comm/research/fp6/ FP6

Data base evaluators:
3. P. Westhoff (FAPRI, Missouri): Commodity Market Perspective

FAPRI Commodity Market Perspective

Pat Westhoff (westhoffp@missouri.edu)
FAPRI-Missouri (www.fapri.missouri.edu)
“Commodity Modeling in an Enlarged Europe”
IPTS, Seville
November 6, 2006

Agenda

- Highlights of FAPRI outlook
- Major factors driving the outlook
  - Biofuels
  - Everything else
A word about FAPRI

- Food and Agricultural Policy Research Institute
  - Joint institute of University of Missouri and Iowa State University
  - Work with Texas A&M, Univ. of Arkansas, Arizona State, Univ. of Wisconsin, USDA, Teagasc, Queens University, OECD, FAO, European Commission…
- Mission: provide objective, quantitative analysis of agricultural markets and policies
- Funding primarily from annual USDA grants mandated by the U.S. Congress

U.S. export prices for maize: January 2006 projections

- FAPRI January 2006 baseline showed rising dollar prices for maize and other cereals
- Increase was primarily due to growth in U.S. ethanol demand, with some growth in global feed demand
- Euro was assumed to strengthen vs. dollar ($1.41/euro by 2007), so projected change in prices measured in euro was modest
- Note that January projected U.S. export price for maize is below EU cereal intervention price

Source: FAPRI Jan. 2006 baseline
U.S. export prices for maize:
Comparing projections and recent futures prices

- 5-year FAPRI baseline update in July showed higher prices for maize and other cereals
- 26 Oct. futures prices were noticeably higher
- Some supply issues (e.g., failure of Australian wheat crop, U.S. corn crop smaller than earlier estimated)
- But mostly caused by very strong demand, especially to produce ethanol in U.S.

![Graph showing U.S. export prices for maize](image)


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U.S. maize used to produce ethanol

- Ethanol production doubled between 2001 and 2005
- In July update, FAPRI projects another doubling between 2005 and 2009
- Capacity expansion plans indicate even faster ethanol production growth is possible

![Graph showing U.S. maize used to produce ethanol](image)

Source: FAPRI Jan. 2006 baseline and Jul. 2006 baseline update
FAPRI July 2006 projections of U.S. grain exports and maize used for ethanol

- In July projections, U.S. ethanol use of maize exceeds U.S. maize exports in 2007/08
- By 2010/11, ethanol use of maize exceeds total U.S. grain exports
- Growth in ethanol use limits grain available for export, in spite of area shifts to maize from other crops

![Graph showing U.S. grain exports and maize used for ethanol projections]

Source: FAPRI Jan. 2006 baseline and Jul. 2006 baseline update

U.S. ethanol plant net operating returns

- Until 2005/06, U.S. ethanol plants were usually profitable only because of tax credit ($0.51/gallon or $0.135/liter)
- With higher ethanol prices, plants made record profits in 2005/06, and would have had positive margin even without tax credit
- Projections assume declining oil prices ($53/barrel by 2010)
- Lower ethanol prices and rising maize prices shrink margin
- By 2010/11, positive margin again depends on tax credit

![Graph showing U.S. ethanol plant net operating returns]

FAPRI estimates, July 2006 update.
Other ethanol implications

- More maize production in U.S. and elsewhere
- Less oilseed production in U.S. and elsewhere
- Higher world grain and sugar prices
- Increased co-product feed availability
- Lower protein meal prices
- Higher feed costs for those feeding grain
- Ambiguous feed cost changes for those using lots of protein meal or maize co-products
- Reduced fiscal cost of U.S. farm programs (offsetting cost of tax credits)

U.S. farm program subsidies to grain, oilseed, and cotton producers

- U.S. producer subsidies were large in 2004/05 and 2005/06 due to low market prices
- At prices projected in FAPRI's July 2006 update, payments tied to prices (marketing loans, countercyclical payments) drop sharply
- These deterministic projections suggest low U.S. amber (and blue) support levels
- Dairy and sugar support programs (with AMS around $6 billion) would account for most of U.S. amber box
- Stochastic analysis indicates some probability of lower prices & higher payments—stochastic mean would exceed this deterministic estimate

Source: Unpublished July 2006 estimates
Biodiesel implications

- Sharp growth in production in Europe, beginning in U.S.
- New demand increases price for vegetable oil
- But resulting increase in crush results in increased supplies of oilseed meals
- Increase in supply and competition from corn co-products both depress prices for oilseed meals
- Rising vegetable oil prices could eventually make biodiesel less attractive

![Graph showing prices over time](source)

Source: FAPRI estimates, July 2006 baseline update

Other factors driving world grain and oilseed outlook

- Biggest factor in any given year: weather
  - Short Australian crop a major reason for wheat price rise
  - One reason we do stochastic estimates
- Livestock sector developments
  - China growth in meat production/consumption
  - Avian influenza, BSE, other disease issues
- South American production growth
  - Exchange rate, rust have slowed Brazilian soybean growth
  - But lots of potential remains and Argentina expands
- Domestic policies, trade agreements…
Beef net trade
January 2006 projections

- Brazil has emerged as largest exporter of beef
- Continued growth projected for Australia
- EU has become net importer, and a modest further increase in EU imports is projected
- U.S. imports have grown and exports collapsed because of BSE case
- Slow recovery projected in U.S. beef exports, but U.S. remains net importer in volume terms

U.S. livestock and poultry prices

- U.S. livestock, poultry prices are at best crude indicator of world market conditions
- Projected U.S. cattle prices fall as production expands
- Cyclical price movements continue in hog market
- Poultry prices fairly stable, as higher grain prices offset by lower meal prices
Skim milk powder, FOB N. Europe: January 2006 projections

- International prices for skim milk powder increased between 2002 and 2005.
- Increase was larger in dollar terms than in euro, given strengthening euro.
- After dip in 2006, projected price increases slightly in dollar terms, but little trend in euro terms.

![Graph showing currency per metric ton from 2000 to 2014 for dollars and euros.]

Source: FAPRI Jan. 2006 baseline

Why all these projections will prove to be wrong

- Projections are based on assumptions, and reality never matches assumptions.
  - Weather won’t be average in any given year.
  - Policies will change (e.g. 2007 farm bill, WTO…).
  - Macroeconomic conditions won’t match those assumed here.
    - Economic growth.
    - Interest and exchange rates.
    - Petroleum and other energy prices.

- Models aren’t perfect reflections of reality, and analysts aren’t as smart as we’d like to think.
So are we in a new world?

- Biofuel potential to fundamentally change markets is real
- But there has been a lot of hype that portrays uncertain developments as sure things
  - Especially in U.S., contingent on petroleum price developments
  - In Europe and U.S., contingent on supportive policies
- At least for now, has given agriculture another engine for growth besides export markets
4. D. Kelch (ERS, USDA): CAP Reform from a U.S. Perspective

CAP Reform from a U.S. Perspective

Dr David Kelch

A USDA Baseline Perspective

- USDA Baseline mandated by Congress (budget process of Executive Branch)
  - Projects 10 years out
  - Focused on major commodities (wheat, rice, cotton, oilseeds, feed grains, meats)
  - Includes major trading countries, ROW
  - A global solution for prices
Baseline Players

- Country models in ERS- current policy, varying complexity
- Commodity analysts- from World Board, Foreign Agricultural Service (FAS), ERS
- Regional and Macro analysts- ERS, FAS
- Commodity meetings (Oct-Nov)- examine & debate model results (Nov-Dec)
- Review adjustments, approve (Jan.), publish (Feb.)

CAP in the Baseline

- EU-25 aggregate model (ESIM)
- Assume current policy & normal weather
  - e.g. biofuels policy, decoupled payments continue, incorporate new member states
- Exceptions to above: set aside, stocks/use trigger, WTO limits-these require judgments (history)
- A consensus based on technical, economic, financial, historical, and
Current CAP

- What is different from last year?
- CAP Reform incorporated as published
  - use consultants, research, publications
- Weighted incorporation of SFP - 90%
  decoupled now
- Movement from trend resisted- Why?
- Assumptions abound- slippage, currency
  rates, GDP, oil prices, budget, transport,
  weather, marginal land---

An Example: Grain Area and Yield

- Food and Feed Wheat, Durum Wheat,
  Barley, Corn, Other Coarse Grains,
  Rice
- Base- no CAP Reform
- Scenario- full CAP Reform by 2006/07
- From Last Year’s Baseline
Chart 1. EU-25 Grain Area Harvested: Base VS Scenario

Chart 2. EU-25 Grain Yields: Base vs Scenario
**CAP Reform Conundrums**

- Effects of payments on new member states—compare to previous enlargements
- Land use/compliance, area
- Crop shifts/market orientation
- Sugar beet/rye/other crop substitution
- Beef production/pasture
- Who gets the payment?
- Budget limit implications
Reform Conundrums continued

- Carbon credit effect-oilseeds/biodiesel
- Modulation of SFP- U.S. example
- Ethanol: Sugar? Wheat?
- Cotton, tobacco- area & yield effects

Overall effects on productivity & efficiency

Model + Expertise=Results

- Model- a sophisticated set of economic relationships that track and project complex interactions
- Expertise- adjust the model for unaccounted phenomena that affect everything else (budget, inputs, etc.)
- Debate revolves around intercepts, slopes, elasticities, crop allocation, trade direction (everybody wants to produce & export)
Expertise Derived from …

- EU Commission estimates, EU Academic and Trade Journals & Conferences
- FAS Reports, AgraEurope, HGCA, Toepfers, F.O. Licht publications, country contacts, Monsanto, Cargill, (Google)
- Institutional memory- history & philosophy of the CAP & U.S. agriculture

How Good Are the Numbers?

- ERS baseline- a set of projections based on assumptions
- Used for policy analysis- not a forecast
- Good reviews- a good story
- Necessary for debate- always questioned
- Transparent in assumptions
- Superior to model dependence alone
GO TO:

5. W. Münch (European Commission, DG AGRI): Model based policy support and baseline analysis in DG AGRI

Model based policy support and baseline analysis in DG AGRI

Wolfgang Münch

"Commodity Modelling in an enlarged Europe", IPTS Sevilla, 6 November 2006

Structure

- Model based analysis in DG AGRI
  - institutional structure
    - which parts of the DG
    - which models
  - role of the market baseline
  - policy analyses

Challenges

Model based policy support and baseline analysis in DG AGRI, Nov 6, 2006, AGRI/G2
Institutional structure: Modelling capacities in DG AGRI

- Economics Directorate
- Themes
  - G2: Europe, Enlargement, Regional Analyses
  - G5: International analysis

Used Models

- ESIM
  - EU, country analysis, enlargement, crops, biofuels….
- AGLINK
  - World markets, trade partners, trade negotiations, meat and milk markets…
- CAPRI
  - Regional analysis, rural development…
The DG AGRI Commodity baseline

- biannual process
- taking into account the short term commodity forecasts
- consolidation of the baseline in close cooperation with market experts
- publication in a report of
  - the most plausible developments over the medium term.

Examples: Cereal baseline

Model based policy support and baseline analysis in DG AGRI, Nov 6, 2006, AGRI/G2
W. Münch (European Commission, DG AGRI): Model Based Policy Support and Baseline Analysis in DG AGRI

Example: Maize markets in Hungary

Example: Beef markets
Example: Regional analysis
Regional distribution of cattle production in 2013

Note: From dark green to dark red: From around 1 thousand to more than 4 mio heads.

Policy analysis

- baseline as the starting point
- recent analysis:
  - WTO
  - biofuels
  - alternative policy options for cereal markets in land locked new Member States
  - impact of accession Bulgaria and Romania
  - regional impact of decoupling
Requirements for DG AGRI in-house models:

- up to date models; credible; incorporation of knowledge (e.g. country expertise)
- need to respond quickly to new political developments;
- ensures confidentiality, timeliness, answers to evolving questions
- balance between handling and complexity

Challenges I

- EU becomes increasingly divers and larger:
  - market separation,
  - diversity of regions;
- monitoring of countries:
  - present and future candidates: Turkey, western Balkan…
  - neighbouring countries: Ukraine…..
- monitoring of key markets of the EU: Mediterranean basin, near and middle East, ACP; China…..
Challenges II

- link between markets and rural development
  - analysis of regional indicators
- representation of factor markets
  - land markets (for sure)
  - labour markets?
6. M. von Lampe: (OECD): Aglink Modelling Approach and Baseline Results for the EU-25

**Aglink Modelling Approach and Baseline Results for the EU-25**
The OECD-FAO Agricultural Outlook 2006-2015

Martin von Lampe
Directorate for Food, Agriculture, and Fisheries

Workshop on “Commodity Modelling in an enlarged Europe”
IPTS Sevilla, Spain
6 November 2006

**General features**
- Recursive-dynamic specification
- Most of the agricultural market variables endogenous
  - Exogenous: macro-economic and (most) policy variables
- Policy-specific model
- Commission data
- Parameters: mix of literature, estimations, model derivatives, calibration results
Commodity coverage

- Aglink commodity coverage
  - Cereals (wheat, coarse grains [maize, barley, oats, other], rice)
  - Oilseeds (sunseed, rapeseed, soya) and corresponding oils and meals
  - Pasture (limited representation)
  - Meat (beef & veal, pork, poultry, sheep & lamb)
  - Dairy (milk, butter, cheese, smp, wmp) [plus: fresh dairy products, concentrated milk, whey powder, casein]
  - Sugar: separate model

Regional disaggregation

- EU-15 Endogenous sub-modules
- POL, HUN Endogenous sub-modules
- EU-08 Exogenous block
- EU-25 Envelope model: Stocks, Trade, (prices)

To be included to exogenous EU-10 block for baseline 2007
To be included to an endogenous EU-12 module in the medium term?
The Aglink EU-25 Module

Crops: Area allocation and payments

- Single Farm Payment
- Total area for cereals, oilseeds, set-aside, fodder crops and pasture
- Symmetric crop area payment
- Total area for cereals, oilseeds and set-aside
- Asymmetric crop area payment
- Total area for fodder crops and pasture
- Intervention prices
- Total cereals area
- Total oilseeds area
- Set-aside land
- Wheat
- Barley
- ... Rapeseed
- Sunf.seed

Crops: Policy representation

- Subsidised Exports (wheat, coarse grains)
  - $f(PP, SP, WTO\text{-}limit)$
- Intervention Stocks (wheat, cg, rice)
  - $f(PP, SP)$
- Set-Aside: compulsory / voluntary
- Payments: area, SPS
**The Aglink EU-25 Module**

**Crops:**

- Expressed on a per hectare basis
- Different levels of the area allocation system
- Coefficients expressing the degree of decoupling
  - obtained from PEM simulations
  - production factors transformed to area factors
  - area payments: 0.179 (rice), 0.267 (grains/os)
  - SPS payments: 0.077 (rice), 0.114 (grains/os)
- differences in area and yield elasticities

**The Aglink EU-25 Module**

**Beef:**

- Subsidised exports
  - $f(PP, SP, WTO-limit)$
- Import quota for high quality cuts
- Various payment schemes
The Aglink EU-25 Module

Beef: Payment schemes

• Different headage payments
  – endogenously generated
  – additional price incentive to producers

• SPS payments
  – SPS also applies to pasture
    • … but pasture not linked to beef production
  – SFP per head calculated from SFP per ha
    • divided by weighted average stocking density
  – decoupling factor for crops used: 0.06

The Aglink EU-25 Module

Dairy markets: Policy representation

• Milk quota
  – exogenous production
  – reduced by rise in fat/protein content

• Subsidised exports (butter, SMP)
  – f(PP, SP, WTO-limit)

• Subsidised exports (cheese, WMP)
  – f(PP_{milk}, SP_{milk}*, WTO-limit)

• Milk payments, SPS
  – no direct impact on milk production: quota
The OECD-FAO Agricultural Outlook 2006-2015

Projections for world and EU markets

- World price projections
- EU-25 underlying assumptions
- EU-25 projections
  - Cereals & Oilseeds
  - Meat
  - Dairy
- Possible impact of biofuels

The OECD-FAO Agricultural Outlook 2006-2015

World price projections
Cereals

![Graph showing world price projections for cereals from 1995 to 2015.](image)

- Wheat: +10%
- Rice: +8%
- Maize: +30%

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The OECD-FAO Agricultural Outlook 2006-2015

World price projections
Oilseed sector

Vegetable oils

Oilseeds

Oilmeal

USD/tonne (seeds, meal)


100 150 200 250 300 350 400 450 500 550 600 650 700

USD/tonne (oil)

The OECD-FAO Agricultural Outlook 2006-2015

World price projections
Meat

USD/tonne


0 500 1000 1500 2000 2500 3000 3500

Beef - US Choice Steer price
Beef - Argentina wholesale price
Pork - US market price
Pork - Brazil producer price

OECD OCDE
M. von Lampe: (OECD): Aglink Modelling Approach and Baseline Results for the EU-25

The OECD-FAO Agricultural Outlook 2006-2015

World price projections
Dairy

The OECD-FAO Agricultural Outlook 2006-2015

EU-25 underlying assumptions

- Constant real exchange rates after 2006
  - 1 € = 1.193 US$ by 2015
- Stable economic growth
  - EU-15 ~2.1% p.a.
  - Poland ~4.2% p.a.
  - Hungary ~2.7% p.a.
- 2003 CAP reform
- Biofuel growth implicitly and partially accounted for
The OECD-FAO Agricultural Outlook 2006-2015

EU-25 Cereal Projections: Yield growth

Notes: * 1995-2005 growth is calculated from fitted exponential trend
** EU-08 historical growth refers to 1995-2003 period

The OECD-FAO Agricultural Outlook 2006-2015

EU-25 Cereal Projections: Growing wheat exports

Production, Domestic use, Exports, Imports, Ending stocks
EU-25 Cereal Projections: Declining coarse grain stocks

EU-25 Oilseed Projections: Growing oil and meal imports
The OECD-FAO Agricultural Outlook 2006-2015

EU-25 Meat Projections:
Beef imports on the rise

- Production
- Domestic use
- Ending stocks
- Exports
- Imports

EU-25 Meat Projections:
Little change in pork trade

- Production
- Domestic use
- Ending stocks
- Exports
- Imports
EU-25 Dairy Projections: Expanded quotas...

EU-25 Dairy Projections: ...

... but the dynamics are elsewhere
The OECD-FAO Agricultural Outlook 2006-2015
EU-25 Dairy Projections: Declining butter and SMP exports

Possible impacts of biofuel growth
Growth in biofuel production a major driver for crop markets

- Biodiesel growth drives EU oilseed area up by 17%, production by 35%
- International maize prices up due to US ethanol growth; sugar prices driven by Brazil ethanol growth
- 5.75% fuel replacement could use land equivalent to up to 25% of current cereal, oilseed and sugar crop land
  - but: set-aside land to be used; technology?
7. H. Matthey (FAO - Commodities and Trade Division): OECD-FAO Aglink-Cosimo Projection System

Outline

• Introduction to OECD-FAO Aglink-Cosimo
  – Structure
  – Outlook Process

• EU Model
• 2006 Baseline
OECD-FAO Projection Work

Joint outlook preparation between OECD and FAO

- Started in 2004
- Annual process
- Expansion of OECD Aglink model to developing countries
- Utilize global expertise

What is Aglink – Cosimo?

Commodity Simulation Model

- Partial Equilibrium Model
- Dynamic Model
- Policy Specific Model
H. Matthey (FAO - Commodities and Trade Division): OECD-FAO Aglink-Cosimo Projection System

Aglink – Cosimo Commodities

Wheat Beef Skim Milk Powder
Coarse Grains Sheepmeat Whole Milk Powder
Rice Pigmeat Cheese
Oilseeds Poultry Butter
Vegetable Oils Eggs Fresh Dairy Products
Oilseed Meals

Aglink - Countries

Australia Canada EU-25 Japan S.-Korea
Mexico N-Zealand USA
Argentina Brazil China Russia

E-08 Norway Switzerland

Commodities and Trade Division
Data Requirements

Annual time series for:
- prices
- supply (area, yield, animal numbers...)
- demand (food, feed, crush...)
- trade (exports, imports)
- macroeconomic data (GDP, ex. rate...)
- policy variables (tariffs, CAP...)

Other Eastern Europe

Separated out in 2007 Baseline
The strategy for parameter choices

1. Use available estimates
2. Use systems / appropriate constraints
3. Estimate: research estimation agenda

Model validation – by country / by commodity
Emphasis on consultation with experts

Getting the Outlook started....
Structure, mandate and process differ between OECD and FAO

<table>
<thead>
<tr>
<th>OECD</th>
<th>FAO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model documentation and updates</td>
<td>Data base development (collection and estimation)</td>
</tr>
<tr>
<td>Training and guidance of co-operators in the development phase</td>
<td>Development of individual country outlooks</td>
</tr>
<tr>
<td>Overall technical support</td>
<td>Coordination with FAO experts</td>
</tr>
<tr>
<td>Scrutinizing the contributions of participating countries</td>
<td>Creators, developers</td>
</tr>
<tr>
<td>Mediators, facilitators, catalysts</td>
<td></td>
</tr>
</tbody>
</table>

Commodities and Trade Division
Commodities and Trade Division

Aglink – Cosimo Outlook Process

- OECD Questionnaire Responses
- OECD Experts
- OECD Commodity Groups
- Calibrated Stand-alone Models
- Adjusted Stand-alone Models
- FAO Databases
- FAO Experts
- Exogenous Prices
- OECD-FAO World Agricultural Outlook
- Iterations, Exchange of R-factors
- Solve for endogenous prices

Uncertainties and Limitations

Related to:
- macroeconomic developments
  - Brazil, China and India,
- technology advances, energy prices, investment in bio-fuel capacity
- weather-related production shocks, disease outbreaks
- agricultural policy developments
  - Doha Development Agenda of multilateral trade negotiations

Commodities and Trade Division
8. M. Banse (LEI, The Netherlands): The European Simulation Model (ESIM)

The European Simulation Model (ESIM)

Martin Banse, LEI (The Hague)
“Commodity Modeling in an Enlarged Europe”, IPTS, Seville
November 6, 2006

Quantitative Instrument of Analysis

- Recursive dynamic partial equilibrium model
- 28 regions (EU-10, Bulgaria, Romania, Turkey, EU-15, the US and RoW)
- Projection period 2003-2020
- Commodity coverage:
  - 20 crops, 6 animal products, pasture and voluntary set aside
  - Bio-fuels: Oilseeds, sugar and grain
- Processing activities:
  - milk processing:
    • Raw milk ⇒ fresh milk, butter/SMP, cheese, other dairy products
  - oil-seed processing:
    • seed ⇒ oil (food or bio-diesel) and cake
  - ethanol production
    • Wheat/com/sugar ⇒ ethanol (and gluten feed)
### Scenarios: Baseline

- **Domestic policies:**
  - Continuation of MTR
  - Increase in modulation (up to 25%)

- **Trade policies:**
  - Implementation of EU-offer

- **Enlargement**
  - 2015: Turkish EU-Accession

### Result of the Baseline Scenario

- **Arable Crops**
  - Production in mio t
  - Area in mio ha

- **Livestocks**
  - Production in mio t
  - Consumption per capita
Cereals: Production and Area Use, EU-25, 2005 and 2020

Cereals: Production and Area Use, EU-15, 2005 and 2020
Oilseeds & Other crops: Production and Area Use, EU-15, 2005 and 2020

Livestock: Production and Consumption p.c., EU-25, 2005 and 2020
Livestock: Production and Consumption p.c., EU-15, 2005 and 2020

Production, mio t  
Consumption, kg p.c.

Livestock: Production and Consumption p.c., EU-10, 2005 and 2020

Production, mio t  
Consumption, kg p.c.
### Production of Bio-fuel Crops and Imports of Biofuels, 2020

<table>
<thead>
<tr>
<th></th>
<th>EU-25</th>
<th>Baseline</th>
<th>Implementing Biofuel-Directive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio-fuel crops</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Production (mio t)</td>
<td>22.41</td>
<td>39.91</td>
<td></td>
</tr>
<tr>
<td>Area (mio ha)</td>
<td>5.27</td>
<td>8.64</td>
<td></td>
</tr>
<tr>
<td>Bio-fuels (mio t)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>domestically produced</td>
<td>7.03</td>
<td>12.61</td>
<td></td>
</tr>
<tr>
<td>imported</td>
<td>0.98</td>
<td>8.39</td>
<td></td>
</tr>
<tr>
<td>Share in Fuel Consumption</td>
<td>3.6%</td>
<td>7.8%</td>
<td></td>
</tr>
</tbody>
</table>

### Share of Utilized Agricultural Land in total Land available for Agriculture, in %, 2020

![Graph showing the share of utilized agricultural land in total land available for agriculture in EU-25, EU-15, and EU-10 with different scenarios: Baseline, Liberalisation, Regionalisation, Reg. & Fuel Directive.]

- EU-25
- EU-15
- EU-10
## Conclusions

**ESIM:**
- Focused to European agri-food markets
- Written in GAMS with GSE interface
- Flexible tool: Extension with commodities/regions

**Main developments**
- in cereals: Production will increase, area requirements will diminish because of technical productivity improvement
- in livestock: major restructuring,
  - with a concentration on dairy production, poultry meat and pork
  - Further decline in beef production due to changed consumption preferences, and partially the result of trade factors. The changes
  - Increasing productivity in milk production will lead to a decline in total numbers of cows
  - reduced of fodder production

---

**Biofuel directive**
- require 15 mio. t of biofuels,
- If the feedstocks are all grown domestically,
  - this would be equivalent to 12 mio. ha, or
  - 9.4% of EU-25 agricultural land
- Projections show
  - 7 mio. ha used to produce biofuels feedstocks,
  - equivalent to 5.5% of total agricultural land

**Non-food demand of agricultural products (e.g. energy) competes with food demand**

**Possible consequences:**
- increasing food prices with possible adverse effects on food importing (developing) countries
- expansion of agricultural land with implications for the environment
Commodity Modelling in an enlarged Europe

CAPSIM – Status 2006

Peter Witzke, EuroCARE Bonn

IPTS Workshop
Commodity Modelling in an enlarged Europe
Seville, November 6, 2006

Outline

• Scope and key model characteristics
• Baseline methodology
• Selected baseline results
• Some specification issues
• Illustrative alternative scenario
Key characteristics of CAPSIM

- Nonspatial, partial equilibrium, comparative static, no uncertainty
- EU27 ready, Western Balkan ongoing
- 50 products (marketable, non-marketable, processed), 3 inputs + land
- Rather detailed policy coverage
- Different trade regimes possible
- Behavioural functions derived from microeconomics with calibrated parameters
- Technical constraints (area, feed, dairy...)

Typical for outlook work:

- Based on econometrics applied to time series
- But incorporating expert information
  - In evaluation of results and identifying needs for revisions
  - In assessing issues not amenable to formal modelling
- Linkage of initially unrelated projections for subsets of variables (regions, markets)
Typical for impact analysis:

- Good ex post fit is less important than good parameters and structure
- Transparency is most important:
  - Need to explain results
  - No cross checking with observations
- Often: theory driven models with synthetic parameters

Two modes for two tasks:

1) Reference run mode
   - Merges a set of external forecasts
   - Incorporates ex post observations
   - Estimates shifters of behavioural functions

2) Simulation mode
   - Parameters from above are fixed
   - Experiments with exogenous parameters and policy
CAPSIM reference run mode (1)

General approach:

- Express a priori information in terms of “supports” with a priori probabilities
  - Ex post: observed data = supports
  - Future: CAPRI trends, FAPRI projections, ...
- Minimize distance of simulation to supports
- Using constrained shifters (monotonic trends)

CAPSIM reference run mode (2)

Objective function includes weight for relevance of item i:

$$\text{obj} = \sum_i \text{obwgt}_i \cdot \left( \frac{X_i - \overline{X}_i}{\sigma_i} \right)^2$$

- Limited flexibility for shifters is compromise:
  - free shifters would adjust perfectly to external forecasts => no influence of economic model
  - exogenous shifters would remove degrees of freedom => no influence of external forecasts
CAPSIM reference run mode (3)

Example from 2004 outlook: Cheese production for EU23, 1000t

CAPRI Trends (1)

- Constrained trends on short time series (85-04)
- Technological constraints
- Policy shifts are incorporated
  - simulation of future policy on current data
- Some alignment with DG-AGRI baseline in step 3 of whole procedure
CAPRI Trends (2)

• Step 1
  – Independent trends (Variable = a + b*time**c)
  – Usually contradictory, often negative first estimates
  – But R² gives some information on reliability
  – Target values for Step 2:
    \[(R²\text{trend estimate} + (1-R²\text{base year value})) \times (1+\text{policy_shift})\]

• Step 2
  – Minimize difference to supports, weighted with variance of error term of unconstrained trend line
  – Subject to a set of constraints

CAPRI Trends (3)

• Basic “accounting” identities for agricultural variables:
  – Land balance
  – Production equals yield times area
  – Market balances
  – Young animal balances
  – Balances for milk fat & protein
  – Feed requirements (energy, crude protein)
  – ...
World price assumptions (1)

<table>
<thead>
<tr>
<th>Year</th>
<th>SWHE</th>
<th>BARL</th>
<th>MAIZ</th>
<th>RAPE</th>
<th>SUNF</th>
<th>SOYA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>104</td>
<td>105</td>
<td>111</td>
<td>214</td>
<td>209</td>
<td>208</td>
</tr>
<tr>
<td>2015</td>
<td>116</td>
<td>121</td>
<td>119</td>
<td>193</td>
<td>196</td>
<td>187</td>
</tr>
<tr>
<td>Change</td>
<td>12%</td>
<td>16%</td>
<td>7%</td>
<td>-10%</td>
<td>-6%</td>
<td>-10%</td>
</tr>
</tbody>
</table>

World price assumptions (2)

<table>
<thead>
<tr>
<th>Year</th>
<th>BEEF</th>
<th>PORK</th>
<th>POUM</th>
<th>BUTT</th>
<th>SMIP</th>
<th>CHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>1157</td>
<td>1265</td>
<td>1164</td>
<td>1748</td>
<td>1736</td>
<td>3690</td>
</tr>
<tr>
<td>2015</td>
<td>1205</td>
<td>1396</td>
<td>1160</td>
<td>2155</td>
<td>1992</td>
<td>4102</td>
</tr>
<tr>
<td>Change</td>
<td>4%</td>
<td>10%</td>
<td>0%</td>
<td>23%</td>
<td>15%</td>
<td>11%</td>
</tr>
</tbody>
</table>
Macro assumptions

Exchange rate 2003: 0.98 USD/€, 2015: 1.15 USD/€

Cereal baseline results (1)
Cereal baseline results (2)

![Graph showing cereals production over years]

Cereal baseline results (3)

![Graph showing cereals production over years]
Meat baseline results (1)

![Graph showing meat baseline results for EU15]

Meat baseline results (2)

![Graph showing meat baseline results for EU10]
Meat baseline results (3)

Dairy baseline results (1)
Dairy baseline results (2)

Dairy baseline results (3)
Interim discussion

- Reference run mode may integrate scant, contradictory information in a systematic way = solution for small team
- Calibration with 2 (or 1) ex post observations gives high weight to external information (CAPRI Trends, other projections)
- CAPRI Trends = default information with problems
  - Many numbers to check
  - DG Agri baseline needs disaggregation
  - Policy shifts are simplification

Supply/demand specification (1)

Behavioral functions for activity levels and inputs:
= f (revenues, input prices)
(derived from "Normalised quadratic" profit function)

Yields are assumed exogenous:

\[ PRD_{m,i} = \sum_j (YLD_{m,i,j} \times LVL_{m,j}) \]

Balances on land and feed energy/protein imposed
Supply/demand specification (2)

Revenues from market revenues + premiums
- Dairy, sugar with shadow/incentive revenue due to quota
- Premiums with partial decoupling in EU15
- Endogenous fodder prices link crop and animal sector

Demand functions from GL or LES type indirect utility

Derived demand for processing from NQ profit

Microeconomic framework facilitates welfare analysis

Price formation (1)

Typically gross EU extra trade:
- Market equilibrium in CAPSIM: \( PRD - DEM = X - M \)
  where
  \( PRD = s(EU\ text{\ price}) = \text{domestic supply} \)
  \( DEM = d(EU\ text{\ price}) = \text{domestic demand} \)
  \( M = m(EU\ text{\ price},\text{tariffs}) = \text{import supply} \)
  \( X = x(EU\ text{\ price},\text{avg export subsidy}) = \text{export demand} \)

Tariffs, exp subsidies exog or: \( f(\text{admin price}, EU\ text{\ price}) \)

WTO limits currently only monitored, not imposed
Price formation (2)

Intra EU linkage with 'price convergence' weight:

Nat price (t) = EU price (t) * conversion factor

* (1 – price convergence (t))

+ EU price (t) * price convergence (t)

Weight for unscaled EU price increases with time to:

Price convergence = 0.2 (reference run 2015)

Price convergence = 0.5 (alternative run ‘CV50’)

Price convergence: beef

Beef prices in €/t in different EU Member States
Price convergence: maize

Maize prices in €/t in different EU Member States

Price convergence: potatoes

Potato prices in €/t in different EU Member States (without southern EU)
Price convergence impacts (1)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>EU25</th>
<th>EU10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef [100000 t]</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Potatoes</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Grain maize</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Price convergence impacts (2)

<table>
<thead>
<tr>
<th>Commodity</th>
<th>EU10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef [100000 t]</td>
<td>50</td>
</tr>
<tr>
<td>Potatoes</td>
<td>20</td>
</tr>
<tr>
<td>Grain maize</td>
<td>10</td>
</tr>
</tbody>
</table>
Price convergence impacts (3)

波兰

波兰

Hungary

匈牙利

Commodity Modelling in an Enlarged Europe - November 2006 Workshop Proceedings
Price convergence impacts (5)

Final discussion

- CAPSIM relies on microtheory where this saves trouble
- It is pragmatic where theory cannot help
- Price convergence depends on many factors
  - Initial protection
  - Transaction costs (and net trade position)
  - Market power
  - Quality adjustments
  - Improved statistical harmonisation
- May be very relevant topic: Need for empirical research
10. M. van Leeuwen (LEI, The Netherlands): Features of AGMEMOD

Features of AGMEMOD

Myrna van Leeuwen
WUR-LEI
http://www.lei.wur.nl/UK/

IPTS, Seville, November 6th 2006

Overview of presentation

- Background information
- Specification and model issues
- Data and parameters
- Conceptual framework
- Challenges for 2007 and 2008
Background information

- AGMEMOD started in 2001 (5FP)
- Consortium of 23 partners (NMS and AS came in later)
- Templates with standard structures for each commodity, based on GOLD model
- Templates are followed by each team

Background information

- Baseline outlook for EU and Member States (up to 2015)
- Analyse impacts of policy reform
- Analyse impacts of changes in macro-economic environment
Specification and model issues - model type

- Model specification:
  - recursive dynamic commodity market models
  - multi-product
  - partial equilibrium

Specification and model issues - variables

- Exogenous variables:
  - policy variables
  - macroeconomic variables
  - world market prices

- Endogenous variables:
  - supply and use variables
  - EU and national prices
Specification and model issues - commodities

- **Livestock**: dairy cows, suckler cows, calves, other cattle, pigs, poultry, sheep and goats
- **Animal products**: beef and veal, pork, poultry meat, sheep and goats meat, milk, cheese, butter, milk powder
- **Arable products**: cereals (wheat, barley, maize, rye, other grains), sugar beets, sugar, potatoes, oil seeds (soyabees, sun flowers, rapeseeds)

Specification and model issues - policy instruments

- **OMS Agricultural policy (CAP)**:
  - intervention prices
  - animal and hectare premiums
  - quota
  - Single Farm Premiums
- **NMS Agricultural policy (SAP, CNDP and CAP)**:
  - phasing-in and top-up rates
  - national and EU budgetary supports
- **Trade policy**:
  - URAA agreements on export subsidies and import tariff rates
Data and parameters - sources

- Eurostat (balance variables, prices)
- National sources (macroeconomic variables)
- FAPRI (world market prices)
- European Commission (policy variables)

Data and parameters - output

- Supply and use balances: production, consumption, imports, exports, stocks (in annual quantities)
- Land use (hectares), livestock (head)
- Producer prices
- Prices and volumes for inputs (animal feed)
- Agricultural sector income
- EU payments on premiums, subsidies
Data and parameters - parameters

- Econometric estimation of equations in old Member State models
- Calibration of equations in new Member State, Bulgarian and Romanian models. Reasons:
  - short data range
  - data inconsistency
  - structural breaks in policy
- Validation by tests and country expert reviews

Conceptual framework

- Principles of the AGMEMOD philosophy regarding:
  - commodity market model structure
  - country model structure
  - EU15 and EU25/27 model structures
Conceptual framework – commodity approach

- Construction of modelling templates for each commodity market:
  - market description
  - flow charts
  - data on production, consumption, trade, policy instruments, macro-economy, prices
  - structural form equations

Conceptual framework – country approach

- Three commodity groups:
  - arable products
  - livestock products
  - dairy products

- Commodities are linked by substitution and technical relations in production and consumption processes
Conceptual framework - country approach

- Price transmission on commodity market:
  - EU key price (delivered by Member State seen as most important for that commodity)
  - EU key price is specified by world market price, trade agreements, intervention price, EU production and consumption

- Price transmission on EU market:
  - national commodity prices are linked to EU key price and self-sufficiency rates in own and key country respectively

Conceptual framework - implementing SPS in OMS

- Derivation of heterogeneous multipliers:
  - rate that reallocates historic premiums across all agricultural land (time, country, commodity)
  - modulation rate (time, country)
  - expert rate (time, country, commodity)

- Multipliers are linked to historic direct payment (Agenda 2000)
- Synthetic direct premiums (2003 CAP reform) that express supply inducing production effects
Conceptual framework – implementing SPS in NMS

- No historic premiums available
- SAPS: fully decoupled payments on basis of flat rate per hectare
- CNDP: coupled or decoupled payments on basis of flat rate per hectare
- Assumed multipliers that capture possible supply inducing impacts of SAPS and CNDP respectively
- Synthetic direct premiums (per 100 kg) are added to producer price
Conceptual framework - EU approach

- EU15 model
  - combination of old Member State models
  - country commodity models are simultaneously solved by key prices and EU self-sufficiency rates
- EU10 model
  - stand-alone solution of new Member State models
  - exogenous key prices (result of EU15 model) and price convergence
- EU25/27 model
  - aggregation of EU15 model and stand-alone new Member State and Accession State models

Challenges for 2007 and 2008

- ‘Catch-up’ of NMS/AS models
- Induce endogenous world market price formation in a reduced form
- Policy harmonization in EU27 countries
- Extension of new commodities and new countries (Croatia, Turkey, Macedonia, Russia, Ukraine)
- EU25 combined model (also in GSE)
To learn more about AGMEMOD and our IPTS project see:

www.tnet.teagasc.ie/agmemod
Conceptual framework - country approach

Examples of inter-action between commodities:

- **link between cereal and poultry:** poultry production
  - reduced cereal intervention price -> lower cereal prices -> lower (feed) costs -> higher profitability of poultry sector
  - more poultry production -> more cereals needed for feeding stuffs -> positive impact on cereal price

- **link between beef and dairy:**
  - available calves are dependent on dairy and suckler cow stock and on imports
  - calves are used for beef cattle or dairy cattle (dependent on policy, profitability of sectors)
M. van Leeuwen (LEI, The Netherlands): Features of AGMEMOD

EU15 combined model on commodity markets

EU15 model is simultaneously solved

Agricultural income

EU15 Net-export supply

World market price (trade agreements) Intervention price

Policy and macroeconomic variables

EU15 combined model

Harvested land/animal number

Production

Beginning stocks

Yield per ha/per animal

Feed use

Consumption

Ending stocks

Food use

Imports

Exports

EU15 self-sufficiency rate

AG-MEMOD key price

Net export

EU25 model: sum of OMS combined model and stand-alone NMS models (interim solution)

Policy and macroeconomic variables

EU25 model

Price transmission

AG-MEMOD key price

Price Convergence

EU15 combined model

World market price (trade agreements) Intervention price

EU self-sufficiency rate

Commodity Modelling in an Enlarged Europe - November 2006 Workshop Proceedings

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Overview of presentation

- Baseline scenario
- Assumptions
- Baseline projections
- Conclusions
Description of Baseline scenario

- **EU-15:**
  - CAP with national implementation of the Single Farm Payment (SFP) scheme
  - SFP scheme includes possibility of partly coupled direct payments according to national decisions
  - Cut of intervention prices for butter and SMP, additional quotas

- **EU-10:**
  - CAP with SAPS to 2008
  - SFP from 2009: coupled direct payments possible
  - Complementary National Direct Payments until 2013: from 2009 these payments may be coupled
  - National implementation of LA Single Payment Scheme
  - Cut intervention prices butter, SMP
Description of Baseline scenario

- Accession countries (Bulgaria and Romania):
  - agricultural policy regime is assumed to remain unchanged from their pre-accession state

Assumptions of Baseline scenario of EU-25

- Policy variables (beside LA, export subsidies, tariff rate quotas = UR)
- Country specific macroeconomic indicators (population, GDP, inflation, exchange rate national currency/€ and US$/€)
- World market prices (cereals, oilseeds, meat, dairy products)
Macroeconomic developments
- EU-15

Macroeconomic developments
- EU-10
**World crop, livestock and dairy prices (US$/ton) - FAPRI**

World market prices influence the EU key prices and the national prices of the Member States

![Graph showing world crop, livestock and dairy prices](image)

**Market projections**

- EU25/EU27 projections are aggregated of the EU15 combined model results and the stand-alone NMS and AS country model results
- Key prices are endogenously determined by EU15 combined model and are exogenously set for NMS and AS
- It is the first time that results have been produced in this way (combined OMS model and stand-alone NMS models)
Market balance and prices of soft wheat - EU

Production shifts by Technical Progress and decoupling limit possible price increases in the EU market.

Market balance and prices of rape seed - EU

Only limited impact of increased use of rape oil in bio-energy, as policy instruments and energy prices are not yet included in the model.
Market balance and prices of beef and veal – EU

Decoupling leads to a declining beef production and a slight recovery of beef prices compared to world market prices. Increase in domestic use is quite small.

Market balance and prices of pig meat – EU

Technical Progress, and by smaller increases in prices of feedstuff induce growing pork production and trade surplus.
Market balance and prices of butter – EU

Intervention price cuts and additional quotas induce decline in butter production and stable consumption, whole sale price above intervention price

Market balance and prices of cheese – EU

LA has minimal impact on cheese price, production and consumption increase, less surplus available for export
Qualification

- Overall development of the different sectors seems reasonable with some exceptions
  - Poultry sector: price / cross price impact on demand
  - Feedback of the livestock sectors on feed demand
  - Bio-energy to be implemented
- Prices:
  - Key price equations need to be re-estimated for EU-25/EU-27
  - Endogenous formation of world market prices
- Data problems:
  - Divergence between last observation and new data
  - Not all data available and reliable

Conclusions

- Decoupling lead to limited production shifts:
  - Wheat and oilseed production are increasing
  - Beef production is declining – EU net importer
  - Indirect effects in other sectors like pig meat production
- LA in the dairy sector:
  - Further production shift towards cheese
  - Domestic prices above intervention level
  - EU will become a (small) net importer of SMP and butter
Conclusions

- Demand in several sectors will increase slower than production (e.g. cereals)

- Prices:
  - In general, narrowing price gap between domestic and world market prices
  - With the exception of dairy production prices will slightly increase or remain stable
  - Prices in the dairy sector will remain above the intervention prices

Thank you for your attention

www.tnet.teagasc.ie/agmemod
Overview of selected EU 25 agricultural market baseline projections

Seville, 6.11.2006
Workshop: Commodity Modelling in an enlarged Europe

Institute for Prospective Technological Studies (IPTS)
Seville, Spain

Population growth

Macroeconomic variables

Population - EU25
Population EU25 OECD
Population EU25 ESIM
Population - EU15
Population - EU10
Population EU10 ESIM
Exchange rate

Macroeconomic variables

Inflation

Macroeconomic variables
Exchange rate

World market price - Wheat
Crop Production, Domestic use

World market price – SMP, WMP, cheese, butter

- SMP, FOB N. Europe
- WMP, FOB N. Europe
- Cheese, FOB N. Europe
- Butter, FOB N. Europe

EU25 wheat

- Production
- Domestic use

Crop Production, Domestic use
Further discussion:

- Exchange rate assumption
- World market price differences
- Differences in calculation of production and domestic use
- Oilseeds domestic use generated by ESIM
- Higher projected pig meat production (AGMEMOD)

Commodity Markets in Detail EU25/27 (I) Cereals and Oilseeds

Kevin Hanrahan
Rural Economy Research Centre (RERC), Teagasc
http://www.teagasc.ie/rrrc

IPTS, Seville, November 6th 2006

Overview of presentation

- Baseline scenario
- Assumptions
- Baseline projections
- CAP reform scenario analysed
- Assumptions
- Scenario projections
- Conclusions
Baseline Scenario

Description of Baseline scenario

- **EU-15:**
  - CAP with national implementation of the Single Farm Payment (SFP) scheme
  - SFP scheme includes possibility of partly coupled direct payments according to national decisions

- **EU-10**
  - SAPS until 2008, SFP from 2009
  - CNDP (may be coupled), phasing out by 2013

- Macroeconomic and World price projections discussed earlier
Baseline Assumptions

- SPS implementation
  - Reflects MS choices
  - Reflects modulation
    - Including voluntary
  - Reflects redistribution of SFP across all eligible area
  - Reflects assumptions (ad hoc) on share of SFP “retained” in agriculture

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Baseline Results Total Grains EU25 and EU27
Baseline Total Grains Results

- Production increasing
  - Growth in yields and in area in NMS
  - Shift from coarse grains to soft wheat
- Supply growth moderates the positive impact of strong world prices on EU prices
  - Negative impact of decoupling on production outweighed by market conditions
  - Moderate growth in domestic use implies increased EU net-exports
- Differences in country level projections
  - Growth in grains production stronger in MS that kept some A.A. payments coupled

Baseline UK and FR

[Graph showing FR and UK Total Grains from 2000 to 2015 with production, domestic use, and wheat price trendlines]
Baseline Projections

- The French and UK results illustrate the differing evolutions of S&U balance under the Baseline
  - Soft wheat production declines in UK but increases in FR
  - In general soft wheat and maize production increases with declines in barley and durum wheat area
- The increase in production under the Baseline leads to increased net exports from the EU
  - World market prices are currently exogenous determined
  - This significant structural weakness in the AGMEMOD model is to be addressed shortly
  - The small country assumption is not appropriate for a “country” as large as the EU
Baseline Oilseeds

- In general strong world prices lead to increases in area
  - With ongoing technological progress this leads to increased production
- Growth in rapeseed production accounts for most of growth
  - Particularly strong in FR, UK and DK and many of the NMS
- Strong growth in IT soybean production

Further CAP Reform Scenario

- FCR
  - Increased Modulation
  - Full decoupling of A.A.
  - Implies changes in Multipliers
- Do not expect large effects relative to Baseline
- For NMS SAPS? SPS and is already “fully” decoupled

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Further CAP Reform

FCR EU25 – EU25 Total Grains

Total Grains - Change from Baseline

![Bar chart showing change in total grains from baseline from 2007 to 2015 with categories for production, price of wheat, and domestic use.]

- Production
- Price (wheat)
- Domestic use

Commodity Modelling in an Enlarged Europe - November 2006 Workshop Proceedings

FCR EU25 – EU25 Soft Wheat

Soft Wheat - Change from Baseline

![Graph showing Soft Wheat production, price, and domestic use changes from baseline from 2007 to 2015.]

FCR EU25 – EU25 Barley

Barley - Change from Baseline

![Graph showing Barley production, price, and domestic use changes from baseline from 2007 to 2015.]

Production | Price (wheat) | Domestic use
FCR EU25 – EU25 Maize

Maize - Change from Baseline

As expected the impact of the Further CAP reform scenario is very limited
Both Soft wheat and barley production decline
Prices increase and domestic use declines
Linked to changes in EU livestock sector
Various MS react differently
FCR EU Member States - ES

Maize - Change from Baseline

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<tr>
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<th>Production Change</th>
<th>Price Change</th>
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<tbody>
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FCR EU Member States - DE

Maize - Change from Baseline

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FCR EU Member States – IT

Soft Wheat - Change from Baseline

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FCR EU Member States – DE

Soft Wheat - Change from Baseline

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FCR EU – country commentary

- There are projected differences between the countries that now decouple versus those already decoupled
  - In general MS with coupled A.A. see greater decreases
  - Modulation increases mean that production declines across all cereals

FCR – Oilseed Projections

- Decoupling negatively affects the production of oilseeds
- Internal EU oilseed and oilseed meal and oil product prices are largely driven by world prices
- This means that FCR (or any other scenario) does not affect world prices
- We have work to do in this area
  - To be addressed in FP6 project
FCR EU25 - Total Oilseeds

Total Oilseeds - Change from Baseline

FCR EU25 - Rapeseed

Rapeseed - Change from Baseline
FCR EU Member States - ES

Sunflower seed - Change from Baseline

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FCR EU Member States - FR

Rapeseed - Change from Baseline

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<tr>
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Further CAP reform Conclusions

- Decoupling of Arable Aid payments coupled under L.A. is limited to a small group of MS
- Modulation affects all Member States
- Impacts are all small
  - Reflects the limited nature of the reform analysed for these markets
  - Reflects the models structure
- Absence of world market impacts a limitation
  - World prices are currently exogenous
  - FP6 project will address this weakness
Concluding remarks

- The multipliers reflect the national level implementation of policy
- Also reflect ad hoc assumptions relating to the supply inducing impact of the SFP
  - Need to reflect further on these assumptions
  - Sensitivity of results across MS and at EU level to these country by country decoupling assumptions
  - Question of need to standardise these assumptions across MS
  - Balance between imposing homogeneity across models versus allowing the models to reflect national characteristics

Thank you for your attention

www.tnet.teagasc.ie/agmemod

Commodity Markets in Detail EU25/27 (II) Dairy and Meats

Trevor Donnellan
Rural Economy Research Centre (RERC), Teagasc
http://www.teagasc.ie/rerc

IPTS, Seville, November 6th 2006

Overview of presentation

- Summary Recap on EU Baseline projections
  - Some Country specific baseline results
- Details of Scenario projections
  - Some Country specific Scenario results
- Conclusions

- EC10 detailed discussion deferred to Session 4
Baseline Scenario

Meats Baseline EU Production

- Pigmeat & Poultry - increasing
- Beef & Sheep meat - decreasing

Index 2000 = 1

Graph showing the production trends from 2000 to 2015 for various meats in the EU.
Meats Baseline EU Consumption

- Pig, Poultry & Sheep meat - increasing
- Beef - relatively stable

Beef Baseline EU25, UK & DE

- **Production**
  - EU down 2%
  - UK up 4%
  - DE down 12%

- **Prices**
  - EU up 5%
  - UK up 2%
  - DE up 5%

- **Domestic Consumption**
  - EU up 1%
  - UK up 18%
  - DE down 14%

Production is generally down. ... but UK production is up, due to end of BSE related OTMS

Rising prices

MS level variation in domestic consumption trends
**Beef and veal EU Baseline Price**

Where implemented, the decoupling of beef payments supports prices due to moderation in beef production.

---

**Sheep EU25, UK & FR**

- **Production**
  - EU down 10%
  - UK down 20%
  - FR down 5%
- **Prices**
  - EU down 1%
  - UK down 4%
  - FR up 5%
- **Domestic Consumption**
  - EU up 10%
  - UK down 8%
  - FR up 25%

Reduced production across most MS. Bigger decreases where full decoupling in place.

Prices moderated through increased imports.

Consumption responds to price changes.
Sheep Baseline Price

Euro / 100kg

Some positive growth in IRL and FR due to lower production

But UK price declining

Pig Price Baseline

Euro / 100kg

Limited price developments – growth in demand met by production, leaving prices stable
Poultry Price Baseline

Technological improvements drive production growth and prices decrease

Dairy Production EU Baseline

Interventions price drop means more milk for cheese.

Reduced feed demand and lower support prices impact on SMP.
T. Donnellan (RERC, Teagasc, Ireland): Commodity Markets in Detail EU25/27 (II). Dairy and Meats

**Dairy Consumption EU**

- 'More cheese please!' Consumer preferences drive increase in cheese consumption.
- Falling prices help maintain demand for butter.

**Butter Baseline EU, UK & NL**

- Production
  - EU down 6%
  - UK down 3%
  - NL down 30%
- Prices
  - EU down 10%
  - UK down 10%
  - NL down 9%
- Domestic Consumption
  - EU up 2%
  - UK up 8%
  - NL up 5%

Falling price and production. Rising consumption. No real surprises here.
Butter Price Baseline

Euro / 100kg

Index

General decline in EU MS prices reflecting reduced intervention price.

World price increasing

Cheese Baseline EU, U & FR

- Production
  - EU up 8%
  - UK up 12%
  - FR down 2%
- Prices
  - EU up 2%
  - UK up 4%
  - FR up 2%
- Domestic Consumption
  - EU up 15%
  - UK up 16%
  - FR up 15%

General upward trend in production and consumption ... but increased imports limit price developments
Cheese Price Baseline

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- Generally positive market outlook in EU.
- Upward move in world prices

SMP Baseline EU, UK & FR

- **Production**
  - EU down 28%
  - UK down 33%
  - FR down 17%

- **Prices**
  - EU down 6%
  - UK down 8%
  - FR down 1%

- **Domestic Consumption**
  - EU down 12%
  - UK up 12%
  - FR down 33%

- Sharp decrease in SMP production
  .....reflecting decline in intervention and market prices.
SMP Baseline Price

Euro / 100kg

Index

General decline in EU MS prices reflecting reduced intervention price.

Convergence of EU and World price.

Further CAP Reform Scenario
Policy – Reminder (1)

- Under Luxembourg Agreement most Livestock payments decoupled across EU
- So our further CAP Reform policy shock (full decoupling) should have limited impact for many EU countries
  - Obvious exceptions for MS where premia were recoupled under the Luxembourg Agreement
- Reflected in model results outcome for EU meats

Policy – Reminder (2)

- And of course for some specific commodities ......
  - FCR impact of move of full decoupling is only felt through EU key prices
  - i.e. MS where under the Baseline full decoupling was already in place
- Having said all this, the policy impacts we see are very modest
FCR Beef

Full Decoupling reduces production, leading to relative increase in price and consumption.

FCR Sheep

Reduced production. Limited price developments. (Increased imports). But price decrease relative to other meats drives small increase in consumption.
Pigs/ Poultry FCR EU

- Limited impact on pigs and poultry
  - Policy not as big a ‘player’ in sector
- Some (very) small cross commodity policy/price impacts
  - Changes in beef and sheepmeat prices
  - Knock on changes in relative prices
- Overall picture differs little from the baseline

Butter FCR EU

Policy unchanged relative to Baseline. Very limited impact at both EU and MS level

![Graph showing EU Production and EU Domestic trends from 2005 to 2014 with very limited impact]

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Cheese/SMP FCR EU

- Again very limited changes relative to the Baseline
  - a reflection of the absence of policy change in the scenario
  - MS results are similar
- Commission now watching this sector very closely?

What’s the Take Home Message? (1)

- Baseline EU Meats
  - Pig and poultry production & consumption growth
  - Beef and sheep more modest production & consumption changes
- Baseline Country Level Meats
  - Differences in national level production paths
  - Largely attributable to decoupling policy choice
  - More uniformity in developments in consumption
What’s the Take Home Message? (2)

FCR Scenario EU Meats
- Beef and sheep
  - Further limited declines in production
  - Most MS had fully decoupled under LA implementation
- Pigs and Poultry
  - Negligible policy impact
  - Technical change, declining real prices and favourable consumer preferences are key drivers of markets (all of which are reflected in baseline)

What’s the Take Home Message? (3)

Baseline EU Dairy
- Cheese production & consumption growth
- Butter & SMP production decline
- Reflects change in intervention supports
- Reduces EU 3rd country export capacity/dependence

Baseline Country Level Dairy
- Relatively little difference in national level production and consumption paths

FCR Scenario Dairy
- No impact due to absence of change in dairy policy in scenario
Conclusion

- **Impacts** of FCR scenario are **small**
  - To be expected given that **policy switch** is **limited**
- Main **driver** of change in **Baseline outcome**
- More work to do:
  - Need to **examine** country level results in more detail
  - Are country level **differences** plausible?
  - Are country level **similarities** plausible?
  - **Interrogate** models (and modellers !!!)
    - Note perspective of the 'bread and butter' market experts
  - Encourage/seek/enforce necessary model revisions

For more info visit our network web ......

www.tnet.teagasc.ie/agmemod
Pigs & Poultry Baseline EU, FR & UK

- **Production**
  - EU up 16% (pigs)
  - EU up 12% (poultry)
  - UK up 46% (pigs)
  - UK up 18% (poultry)
  - FR up 6 (pigs)
  - FR down 1 (poultry)

- **Prices**
  - EU pig up 6% (pigs)
  - EU down 14% (poultry)
  - UK pig up 4% (pigs)
  - UK down 12% (poultry)
  - FR up 4% (pigs)
  - FR down 4% (poultry)

- **Domestic Consumption**
  - EU pigs up 10% (pigs)
  - EU up 23% (poultry)
  - UK pigs up 18% (pigs)
  - UK up 44% (poultry)
AGMEMOD Country Models
Preliminary Results

Development of commodity markets in NMS/CC

Names of Authors: Emil Erjavec
Myrna van Leeuwen

Name of their Institute: University of Ljubljana
WUR-LEI

Motivation

- New member states (NMS)
  - Long-term market and policy convergence impacts
  - Diff. CAP: but (decoupled) single area payments

- Candidate countries (CC)
  - Which accession shifts (shocks?) are expected?
  - Impacts of accession negotiations?

- Maturity of Agmemod Country Models
  - Are the model results relevant for decision makers at the national and multi-national level?
  - Strengths and Weaknesses

IPTS Workshop “Commodity Modelling in Enlarged Europe”
Seville, November 6th 2006
**Background Information**

- **Bottom up country model building**
  - specific economic characteristics efficiently integrated, but the quality depends on partners knowledge and expertise.
  - Preliminary results: models only partially validated!

- **Specific modelling features**
  - Price convergence over time
  - Dummies for accession effects
  - Different policy multipliers for decoupling effects:
    - higher: Pre-accession policy (mainly coupled); CAP coupled measures, CNDP national measures
    - lower: SAPS or SPS (regional version)
  - Reform scenario for NMS means:
    - single area payment as the only measure at the end
    - phasing-out (or immediate abolition) of national coupled measures

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**NMS Results: Some Highlights**

**Crops**
NMS Baseline Projections (Grains)

- Relatively rigid production trends understandable.
- ... however, note that increase in subsidies
- ... and technological development should lead to at least a moderate increase of production.
- PO and HU main players.

NMS Baseline Projections (Grains)

- Majority of MS shows predictable increases...
- Stagnation in production is only result of HU and PO.
- Fact: improvement in HU and PO submodel for grains necessary...
Despite rigid production clear indication of export potential.

In 2015: EE and SI net importers only remain.

HU is the key player...

Export potential is definitely growing...

Mainly rapeseed.

Around 50% increase over 2001 due to change in area and yields.

Exports from the region double!

Main producers: HU, PO, CZ.

Main exporters: HU, SK, CZ.

Still more growth potentials?

Models provide reasonable results...
**FCR Results: Total grain**

- No changes, except HU.
- This is predictable, due to similarity between SAPS and SPS.
- Coupled national measures evidently less important in this sectors.
- Need to review some aspects of the HU models and scenarios.

**NMS Results: Some Highlights**

**Livestock Dairy**
NMS Baseline Projections (Beef)

Beef Production in NMS (000 t)

- Moderate increase or stagnation!
- No price and subsidy effects (decoupled payments)...
- Key player are PO and CZ.
- No more optimistic picture?

NMS Baseline Projections (Beef)

Beef net trade in NMS (000 t)

- However, the region becomes a net exporter of beef.
- Main impact is in PO.
- One could expect even more positive trends,
- ... but the impact on EU 25 will be still limited.
Further decoupling (exclusion of any coupled measures) should have impact on production...

...but partially compensated through price increases.

Only in HU (too strong?) and SL we see impacts.

Further testing and harmonisation of scenarios necessary.

Increase of production due to trends in PO pork industry (key player). Other more pessimistic trends.

The region remains a net importer. Exporting country PO and HU.

The modelling approach does not enable technological development scenarios...

No FCR effects (reasonable).
NMS Baseline Projections (Poultry)

- No real changes in production and trade. Except in Baltic states!
- Important producer PO, CZ and HU.
- Significant increase in consumption.
- The region remains net importer. Exporting country PO and HU.
- Some technological development scenarios?
- No FCR effects.

NMS Baseline Projections (Milk)

- Very stable production.
- Milk quota system stabilises the markets after minor accession.
- Only PO important share in EU 25.
- Export potentials limited...
- No real FCR effects.
Accession Results for Bulgaria:  
Some Highlights

Bulgarian Accession Background Informations

- **Baseline**
  - Relatively low prices (60 - 90 % of the EU 25 levels)
  - Structural breaks in statistics (pork!)
  - Meaningless budgetary support
  - Low production intensity level
  - Price convergence already starting before accession
  - Reduction of population for 1 mio. (2000-2015)
  - Results:  
    - Strong production increase: sunflower seeds
    - Weak production increase: beef
    - Reduction of production: pork (statistical effect also)

- **Accession Assumptions**
  - Price convergence over a brief period or immediate (overnight)
  - Increase in subsidies for 6 steps (until 2015)
  - SAPS and 20 % top-up with national funds
Bulgarian Accession: Crops

- Significant production increases!
- Especially in sunflower. Important player in EU market (more than 10% share).
- Increase in exports also for grains. Intervention purchases interesting alternative?!
- Maize under pressure due to lower livestock production.

Bulgarian Accession: Livestock

- Except sheepmeat no improvements!
- Positive impact of price and subsidies increase is overcome by the restricted milk quota.
- Actually uncompetitive pork and poultry production!
- Technological change and structural support is not included in modelling!
Conclusions - NMS

**Market outlooks**
- Shift to plant production evident, growing export features, but oilseeds only really growing sector. Too pessimistic for grains!
- Livestock shows limited growth potential. Restrictions through quotas and lack of competitiveness.
- Limited market effects of decoupled SAPS payments!

**Further CAP reform**
- Generally, there should be no significant effect of further decoupling of the direct payments for NMS. The Single area payment is decoupled, effect of exclusion of national coupled measures is limited.

**Modelling tasks**
- Partnership could provide applicable and reasonable results for decision makers.
- Still some improvements to be done. Need to focus on HU and PO models for grains (HU for pork).
Conclusions - Accession

- **Bulgaria**
  - Favourable conditions after accession (higher prices and multiple increase in subsidies).
  - Positive effect only in crop production! Especially, sunflower production and export are growing. Grains for interventions?
  - Less competitive livestock production and limitations by milk quota. Some anomalies in Accession negotiations?!
  - Some important products not included yet: wine, vegetables, tobacco.

- **Romania**
  - The model still under construction. Some important steps were done: first baseline.
  - Very weak statistics. Important agricultural country in the EU 27 framework...

To learn more about AGMEMOD and our IPTS project see:

[www.tnet.teagasc.ie/agmemod](http://www.tnet.teagasc.ie/agmemod)
MARS STAT activities on Agro-meteorology and remote sensing

Javier.gallego@jrc.it

http://www.agrifish.jrc.it

PRODUCTION = YIELDS * ACREAGE

Early forecast crop yields

Precise Crop Area Estimates

Meeting on commodities modeling, IPTS November 20, 2006: MARS Agrometeorology
MCYFS: Areas of interest

- EU-25
- Candidates Countries
- Maghreb
- Russia (European part)
- Ukraine
- Belorussia

11 simulated crops:
- Wheat
- Barley
- Maize
- Rice
- Sunflower
- Rapeseed
- Sugar Beet
- Potato
- Field Beans/Peas
- Soy Beans
- Pastures (Rye Grass)
We exist since a while

Mars Crops Yield Forecasting System

Indicators from low resolution satellite data (since 1981)

Statistical analyses: time series, tendency analyses, etc.

Yield forecasts

Indicators from meteo data sets (since 1975)

Indicators from agrometeo parameters

Vegetation Monitoring

Meteorological Monitoring

Crops Model

Statistical Scenarios Analysis

MARS Crop Yield Forecasting System

Linear (YIELD)

Poly. (YIELD)
MARS-STAT Bulletins

Final results are published in the MARS bulletin about 20 times a year distributed as:

- printed issues
- e-mail
- Web
- http://www.marsop.info

Meeting on commodities modeling. IPTS November 20, 2006: MARS Agrometeorology
• Press release August 2003 on impact of severe summer drought

• Press release late June 2005 on impact of persistent drought in western areas
MARS-RESULTS Main use

- **MARS FORECASTS and ANALYSIS are used since 2001**
  - as benchmark by DG-AGRI analysts
  - in charge of food balance estimates for CAP decisions

- **MARS FORECASTS are used since 2003**
  - in the official EUROSTAT forecast system
  - used within the Crop Production Committee of Member States

### Changes of the occurrence of “beginning of flowering”

![Map showing changes in the occurrence of the beginning of flowering between 1975-2005](image)
LUCAS: Support to Eurostat on area estimates

LUCAS 2006 (Land Use/Cover Area-frame Survey):
~ 1,000,000 points photo-interpreted for stratification
(systematic sample of 2 km),
~ 170,000 points visited

Role of IPSC/Agrifish:
• optimisation of sampling design
• Software for LUCAS data inspection
• Software for computation of estimates
17. Conclusions for the AGMEMOD model

The main objective of the workshop was to validate the AGMEMOD model projections of EU agricultural commodity markets, to discuss methodological approaches with modellers and national experts, and to discuss results with policy-makers from respective Commission Services.

Strengths and weaknesses of the AGMEMOD model were discussed:

**Strengths of the AGMEMOD model:**

- EU25/27 combined model (dynamic, recursive, multi-country, multi-market partial equilibrium);
- Individual models from the EU 27 Member States and Ukraine, Russia, Macedonia and Croatia;
- Modelling and analysis of the potential impact of policy scenarios;
- Harmonised database;
- Network of national experts.

**Weaknesses of the AGMEMOD model:**

- Credibility of certain modelling approaches;
- Reliability of particular results;
- Specific country team problems;
- Difficulties of large consortium management.

For the **future** of the AGMEMOD model the following tasks have to be considered:

- Improvement of modelling of coupling/decoupling effects on production through multipliers;
- Incorporation of the rest of the world impact on the EU markets by exogenous world market prices (based on FAPRI projections);
- Justification of key prices applied in the AGMEMOD model;
- Improvement of individual country projection reliability (e.g. the cereal sector in Hungary; the pork sector in Poland; demands of the commodity markets in UK);
- Contribution of the AGMEMOD partnership with commodity market studies to EU policy making process.

The agricultural market projections presented by the different modelling groups (AGMEMOD, FAPRI, ESIM, AGLINK and CAPSIM) showed some variations, however, followed the common general trends in EU commodity markets. Modelling approaches were found in many cases as complementary. A need for closer co-operation of modellers was underlined, especially with regards to the sharing of data bases and results. Co-operation with national experts for the validation of results and with policy makers to develop policy relevant scenarios, were also seen as important preconditions for successful supporting the policy making process.
18. Annex 1: Workshop Agenda "Commodity Modelling in an Enlarged Europe"
JRC-IPTS, Sevilla, 6 November 2006

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<tr>
<th>Time</th>
<th>Presentation and Discussion</th>
<th>Person</th>
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<tr>
<td>9.30 – 10.30</td>
<td><strong>Session 1: Agricultural commodity market prospective</strong></td>
<td><strong>Chair</strong>: Robert M'barek (DG JRC) Pat Westhoff (FAPRI) David Kelch (ERS USDA) Wolfgang Münch (DG AGRI)</td>
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<tr>
<td></td>
<td>1.1 FAPRI commodity market prospective</td>
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<td>1.2 CAP reform from the US perspective</td>
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<td>1.3 Use of models for policy decision making and the baseline analysis in DG AGRI</td>
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<td>10.30 - 10.45</td>
<td><strong>Coffee break</strong></td>
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<tr>
<td>10.45 - 13.30</td>
<td><strong>Session 2: Modelling approaches and baseline results for EU 25/27</strong></td>
<td><strong>Chair</strong>: Pat Westhoff (FAPRI)</td>
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<td></td>
<td>Presentation of main features of modelling <strong>approach</strong> and baseline results EU25/27 (focussing on selected commodities: cereals/oilseeds and meat/dairy).</td>
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<tr>
<td></td>
<td>2.1 AGLINK</td>
<td>Martin von Lampe (OECD)</td>
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<td></td>
<td>2.2 AGLINK-COSIMO</td>
<td>Holger Matthey (FAO)</td>
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<td>2.3 ESIM</td>
<td>Martin Banse (LEI)</td>
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<td>2.4 CAPSIM</td>
<td>Peter Witzke (University Bonn)</td>
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<td></td>
<td>Discussion</td>
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<td>12.15 - 12.30</td>
<td><strong>Coffee break</strong></td>
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<td>13.30-14.30</td>
<td><strong>Lunch break</strong></td>
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<td>14.30-15.30</td>
<td><strong>Session 3: Commodity markets in detail EU25/27</strong></td>
<td><strong>Chair</strong>: Martin Banse (LEI)</td>
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<td><strong>AGMEMOD</strong></td>
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<td>Presentation of main results, highlighting selected country results, baseline and scenarios</td>
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<td>3.1 Cereals/Oil incl. discussion (15 min)</td>
<td>Kevin Hanrahan (AGMEMOD)</td>
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<td></td>
<td>3.2 Meat/Dairy incl. discussion (15 min)</td>
<td>Trevor Donnellan (AGMEMOD)</td>
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<td>15.30-15.45</td>
<td><strong>Coffee break</strong></td>
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<td>15.45-17.15</td>
<td><strong>Session 4: Development of commodity markets in NMS/CC</strong></td>
<td><strong>Chair</strong>: Lubica Bartova (DG JRC)</td>
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<td>Presentation of the most interesting results of CAP reform scenario</td>
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<td>4.1 AGMEMOD</td>
<td>Emil Erjavec, M. van Leeuwen (AGMEMOD)</td>
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<td></td>
<td>4.2 ESIM</td>
<td>Martin Banse (LEI)</td>
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<td>4.3 CAPSIM</td>
<td>Peter Witzke (University Bonn)</td>
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<td></td>
<td>Discussion with contributions of experts from NMS</td>
<td>All</td>
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<td>17.15-18.00</td>
<td><strong>Final Discussion</strong></td>
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<td>Forecasting crop production with agrometeorological models in the EU</td>
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<td>AGMEMOD:</td>
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<tr>
<td></td>
<td>- Ongoing work on development of the AGMEMOD model</td>
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<td>- Expected contributions of model outcomes to policy decision making process</td>
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<td></td>
<td>- Suggestions for further development of the AGMEMOD model</td>
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19. Annex 2: List of Participants

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<thead>
<tr>
<th>Presenters and invited experts</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banse, Martin</td>
<td>Agricultural Economics Research Institute (LEI), The Hague, Netherlands</td>
</tr>
<tr>
<td>Jasjko, Danute</td>
<td>Riga International School of Economics and Business Administration, Latvia</td>
</tr>
<tr>
<td>Kabat, Ladislav</td>
<td>Komenius University, Bratislava, Slovakia</td>
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<td>Kelch, David</td>
<td>ERS USDA</td>
</tr>
<tr>
<td>Matthey, Holger</td>
<td>FAO, Commodities and Trade, ESC Division, Rome</td>
</tr>
<tr>
<td>Thomson, Kenneth</td>
<td>University of Aberdeen, UK</td>
</tr>
<tr>
<td>von Lampe, Martin</td>
<td>OECD, Agricultural Markets and Trade, Paris</td>
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<tr>
<td>Westhoff, Patrick</td>
<td>FAPRI, USA</td>
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<tr>
<td>Witzke, Peter</td>
<td>University Bonn, Germany</td>
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<thead>
<tr>
<th>AGMEMOD participants and presenters</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Bouma, Foppe</td>
<td>Agricultural Economics Research Institute (LEI), The Hague, Netherlands</td>
</tr>
<tr>
<td>Chantreuil, Frédéric</td>
<td>Centre of Agricultural Economics (INRA-ESR), Rennes, France</td>
</tr>
<tr>
<td>Ciaian, Pavel</td>
<td>Slovak Agricultural University (SAU), Nitra, Slovak Republic</td>
</tr>
<tr>
<td>Dol, Wietse</td>
<td>Agricultural Economics Research Institute (LEI), The Hague, Netherlands</td>
</tr>
<tr>
<td>Donellan, Trevor</td>
<td>Teagasc-Rural Economy Research Centre (RERC), Co. Galway, Ireland</td>
</tr>
<tr>
<td>Erjavec, Emil</td>
<td>University of Ljubljana, Biotechnical Faculty (LJUB), Ljubljana, Slovenia</td>
</tr>
<tr>
<td>Ferenczi, Tibor</td>
<td>Corvinus University of Budapest (CUB), Budapest, Hungary</td>
</tr>
<tr>
<td>Foltyn, Ivan</td>
<td>Research Institute of Agriculture Economics (VUZE), Prague, Czech Republic</td>
</tr>
<tr>
<td>Gavrilescu, Camelia</td>
<td>Institute of Agricultural Economics (IEARO), Bucharest, Romania</td>
</tr>
<tr>
<td>Gracia, Azucena</td>
<td>Unidad de Economia Agraria, Centro de Investigacion y Tecnologia Agroalimentaria da Aragon (CITA), Zaragoza, Spain</td>
</tr>
<tr>
<td>Hanrahan, Kevin</td>
<td>Teagasc-Rural Economy Research Centre (RERC), Co. Galway, Ireland</td>
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<tr>
<td>Ivanova, Nedka</td>
<td>Institute of Agriculture Economics (IEABG), Sofia, Bulgaria</td>
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<tr>
<td>Krisciukaitiene, Irena</td>
<td>Lithuanian Institute of Agrarian Economics (LAEI), Vilnius, Lithuania</td>
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<tr>
<td>Lobianco, Antonello</td>
<td>Polytechnic University of Marche-Ancona (INUVPN), Ancona, Italy</td>
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<tr>
<td>Salamon, Petra</td>
<td>Bundesforschansanstalt fur Landwirtschaft (FAL), Braunschweig, Germany</td>
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<tr>
<td>Ludmila Fadejeva</td>
<td>Latvian State Institute of Agrarian Economics (LSIAE), Riga, Latvia</td>
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<tr>
<td>Sepp, Mati</td>
<td>Institute of Economics and Social Sciences of Estonian Agricultural University (EAU), Tartu, Estonia</td>
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<tr>
<td>van Leeuwen, Myrna</td>
<td>Agricultural Economics Research Institute (LEI), The Hague, Netherlands</td>
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<td>von Ledebr, Oliver</td>
<td>Bundesforschansanstalt fur Landwirtschaft (FAL), Braunschweig, Germany</td>
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</table>
Wu, Ziping  
Queen's University of Belfast (QUB), Belfast, UK

**Participants of AGMEMOD Workshop. Seville, November 6th, 2006**

<table>
<thead>
<tr>
<th>European Commission participants</th>
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<tbody>
<tr>
<td>Bartova, Lubica</td>
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<td>Basaran, Pervin</td>
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<td>Gay, Hubertus</td>
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<td>Gallego, Javier</td>
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<td>Gomez, Manuel</td>
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<td>Giray, Fatma</td>
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<td>Lutzeyer, Hans-Jörg</td>
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<td>M'barek, Robert</td>
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<td>Munch, Wolfgang</td>
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<td>Perez, Ignacio</td>
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<td>Pilzecker, Andreas</td>
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<td>Santuccio Federica</td>
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<td>Sorup, Per</td>
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<td>Stein, Alexander</td>
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<tr>
<td>Van Driel, Martin</td>
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<tr>
<td>Velazquez, Beatriz</td>
</tr>
</tbody>
</table>
20. Annex 3 AGMEMOD Partnership:

- **Agricultural Economics Research Institute (LEI), The Hague, The Netherlands:** Hans van Meijl, Myrna van Leeuwen, Andrzej Tabeau
- **Bundesforschungsanstalt für Landwirtschaft (FAL), Braunschweig, Germany:** Petra Salamon, Oliver von Lede
- **Centre of Agricultural Economics, INRA-ESR, Rennes, France:** Frédéric Chantreuil, Fabrice Levert
- **Teagasc-Rural Economy Research Centre (RERC), Athenry, Co. Galway, Ireland:** Trevor Donnellan, Kevin Hanrahan
- **Latvian State Institute of Agrarian Economics (LSIAE), Riga, Latvia:** Danute Jasjko, Guna Salputra, Ludmilla Fadejeva
- **University of Ljubljana, Biotechnical Faculty (LJUB), Ljubljana, Slovenia:** Emil Erjavec, Stane Kavčic, Darja Regoršek
- **Universität für Bodenkultur Wien (BOKU), Wien, Austria:** Martin Kniepert
- **Université Catholique de Louvain (UCL), Louvain-La-Neuve, Belgium:** Bruno Henry de Frahan, Olivier Harmignie
- **Institute of Agriculture Economics (IEABG), Sofia, Bulgaria:** Nedka Ivanova, Mariya Peneva
- **Research Institute of Agriculture Economics (VUZE), Prague, Czech Republic:** Ivan Foltyn, Jan Kubát
- **Food and Resource Economic Institute (FØI), Frederiksberg C, Denmark:** Jorgen Dejgaard Jensen
- **Institute of Economics and Social Sciences of Estonian Agricultural University (EAU), Tartu, Estonia:** Mati Sepp
- **MTT Agrifood Research Finland (MIT), Helsinki, Finland:** Jyrki Niemi, Lauri Kettunen
- **Department of Economics, University of Athens (NKUA), Athens, Greece:** Elias Mantzouneas
- **Corvinus University of Budapest (CUB), Budapest, Hungary:** Tibor Ferenczi
- **Polytechnic University of Marche-Ancona (UNIVPM), Ancona, Italy:** Roberto Esposti, Antonello Lobianco
- **Lithuanian Institute of Agrarian Economics (LAEI), Vilnius, Lithuania:** Irena Krisciukaitiene, Salomeja Andrekiene, Andrej Jedik, Willi Meyers, Aiste Galnaityte
- **Warsaw School of Economics (WSE), Warsaw, Poland:** Sylwia Krawczyńska, Katarzyna Kowalska
- **Institute of Agricultural Economics (IEARO), Bucharest, Romania:** Camelia Serbanescu, Cristian Kevorchian
- **Slovak Agricultural University (SAU), Nitra, Slovak Republic:** Lubica Bartova, Pavel Ciaian, Jan Pokrivcak
- **Unidad de Economía Agraria, Centro de Investigacion y Tecnologia Agroalimentaria de Aragon, (CITA), Zaragoza, Spain:** Azucena Gracia
- **Queen's University of Belfast (QUB), Belfast, UK:** Zi Ping Wu, Philip Kostov
Abstract

This proceedings consist of presentations and conclusions of a workshop on "Commodity Modelling in an Enlarged Europe" held in November 2006. The workshop discussed results of the study "Impact Analysis of CAP Reform on the Main Agricultural Commodities" carried out by the AGMEMOD Partnership, under the management of the Agricultural Economics Research Institute (LEI, Netherlands), in cooperation with the Joint Research Centre – Institute for Prospective Technological Studies (JRC-IPTS). The objective of the study was to generate projections for the main EU agricultural commodity markets for each year from 2005 until 2015.

Detailed documentation on the AGMEMOD modelling approach, as well as results of the study, has been published in five reports within the JRC-IPTS Scientific and Technical Report Series under the heading "Impact analysis of Common Agricultural Policy reform on the main agricultural commodities".

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