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Development of the AG-MEMOD Country Level Agricultural Policy Analysis Tool in the New Members States of EU

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Contribution appeared in Arfini, F. (Ed.) (2005) “Modelling Agricultural Policies: State of the Art and New Challenges”, proceedings of the 89th EAAE Seminar, pp. 307 - 327

February 2-5, 2005

Parma, Italy



**UNIVERSITA' DEGLI
STUDI DI PARMA**

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Development of the AG-MEMOD Country Level Agricultural Policy Analysis Tool in the New Members States of EU

Emil Erjavec* and Trevor Donnellan***

Abstract

This paper describes the development of modelling tools to simulate the effects of agricultural policy changes in New Member States (NMS) of the EU.

Partial equilibrium models, developed as part of the AG-MEMOD (Agricultural Member State Modelling) Partnership, are used to simulate the effects of EU Accession and CAP Reform for countries that have recently joined and countries that may soon join the EU. Results show the effect of policy change scenarios on the main agricultural product markets such as grains, oilseeds, livestock and livestock products, as well as other significant components of agricultural output. Estimates can be provided for each year to a 10-year horizon.

In the paper, the challenges faced in building agricultural policy models for economies, which have only recently completed the transition to a market basis, are described, along with some illustrative examples of key results. The development of these models for the NMS is a step towards their integration, on a more formal basis, with sister models which have already been developed for the EU15 Member States.

Keywords: partial equilibrium modelling, agriculture sector, EU CAP reform, EU Enlargement

1. Introduction

This paper sets out the development of the AG-MEMOD Partnership's approach to the analysis of agricultural policy changes for Central and Eastern Europe Countries (CEEC). The AG-MEMOD Partnership model is an econometric, dynamic, multi-product, partial equilibrium model that allows market projections and simulations to be made in order to evaluate Com-

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mon Agricultural Policy (CAP) instruments at national level and in aggregate for the EU New Member States (NMS) and those countries expected to accede to the EU in 2007.

Ten teams, drawn from institutes across the CEEC and working as part of the AG-MEMOD Partnership, have built compatible models for the agriculture sector in each of their countries. These models account for over three quarters of the agricultural output of the countries that acceded to the EU on May 1st 2004. In addition, there is also coverage of agricultural production in Romania and Bulgaria, the next countries in line to join the EU.

After a structural break that saw a decline in the agriculture of the CEEC in the 1990s, a recovery in production has since occurred in the crop sector, and, to a lesser extent, in live-stock production (OECD, 2002). Scope to describe the agricultural policies in place in the CEEC before accession is limited in this paper. Generally, the norm in the CEECs was to have different (and generally lower price) support mechanisms and less intensive budgetary support (OECD, 2002) than was available in the EU15. Budgetary support mechanisms changed through time and evolved, in the period immediately before EU accession, from policies with an emphasis mainly on input subsidies, towards policies, which were more comparable with CAP type policy mechanisms. However, policies such as area and headage payments, market support interventions and supply constraints were introduced and operated to different degrees across countries.

Accession to the EU will change the economic environment for agriculture significantly in these countries (Münch, 2000, Banse, 2000, European Union, 2003). Commodity price convergence towards EU15 levels, driven by the introduction of price support mechanisms, and followed by the introduction of Simplified Area Payments Scheme (SAPS) – except for Slovenia, which will have an AGENDA 2000 standard scheme – will be experienced across CEEC agricultural sectors. Even though these payments are de-coupled, they could still induce CEEC production to some degree, and this possibility should be analysed. The introduction of CAP reform (probably in 2007 for the NMS) and the increase in direct payments, due to the Accession Negotiation Agreement (European Union, 2003), will be a further step towards integration into the CAP for these countries.

This paper provides an introduction to the Accession States' component of the AG-MEMOD model that has been produced. The paper includes a summary of the work of ten partner teams from across Central and Eastern Europe. It details the challenges faced by practitioners: in assembling the data, and the incorporation of policy modelling mechanisms that allow for the assessment of a number of pertinent agricultural policy developments relating to countries in this region of Europe. The policy environment to be examined includes:

- Baseline precluding EU Accession,
- EU Accession under SAPS and
- EU Accession with the Luxembourg CAP Reform Agreement.

The modelling approach allows projections to be produced to a ten year time horizon.

The paper is structured into four further sections. Section 2 provides some background to the development of the methodology and general issues for the Accessions Countries' modelling task. Baseline scenario assumptions (in the absence of Accession taking place) and related

results are presented in Section 3. Scenario assumptions (Accession to the EU and CAP Reform) are defined and the main projection results are presented in Section 4. Finally, the conclusions that are drawn from the research are presented in Section 5.

2. Modelling Approach and Background

2.1 Methodology and General Issues: The AG-MEMOD Modelling Approach

As noted above, the AG-MEMOD country models are econometric, dynamic, multi-product, partial equilibrium commodity models. As a multi-product modelling system, the model is well suited to reflecting the supply and demand interrelationships among agricultural products (as exemplified by the beef and grains/feed relationship). Behavioural relationships reflecting supply and demand responses can be built in. Another attraction of this model type is the flexibility it offers to incorporate exogenous variables such as technical change, population growth, income and consumer preference trends.

Partners have built their models using a common framework that has facilitated their aggregation to provide results for the CEEC. The aim for the CEEC modelling teams was to provide as wide a level of coverage as is feasible, given the data that are available. Broadly coverage now includes grains (wheat, barley, maize, rye, oats and durum), oils (rapeseed, sunflower seed and soya), livestock (cattle, pigs, poultry and, where relevant, sheep & goats) and livestock products (milk, cheese, butter, skimmed milk powder and whole milk powder). Some partners also included potatoes as an additional commodity.

One of the key challenges that arose for the CEEC modellers was trying to assemble a coherent and consistent set of data for each commodity, in each of the countries modelled. The political and economic changes that many of these countries have undergone in the last 10 to 15 years (Swinnen, 2000) mean that it is often practical, reasonable and meaningful to constrain the data coverage period to relatively recent years. Additionally, the compilation of statistics in these countries has only recently come under the aegis of EUROSTAT, so the lack of common definitions and reporting standards in the compilation of historical data is a particular difficulty in some countries. The annual data used were obtained from national statistics, national academic data bases such as New-Cronos, OECD databases and FAPRI forecasts.

The estimation of the model parameters follows the general rules provided for in the AG-MEMOD modelling approach (Hanrahan, 2001). However, due to data inconsistency and structural breaks in policy, calibration techniques were used. The econometric approach is generally used to give the initial values for the regression coefficient used in the models. Most of the equations in the model are estimated using annual data over an estimation period where data are deemed relevant or over a shorter periods when data are not available. The model produces projections for production of animals and animal products, consumption, exports, imports, stocks and prices.

For a comprehensive description of the structure of AGMEMOD type models (see Chantreuil, Levert and Hanrahan (2005)). In this section of the paper we focus on modelling issues which are specific to the models of the CEEC.

To complete the building of the AG-MEMOD composite models for each of the commodities modelled it is necessary to add an equation describing the equilibrium for each commodity market at both the Member State and EU levels. This condition implies that production plus beginning stocks plus imports equal domestic use plus ending stocks plus exports. In a closed economy, this supply and use equilibrium condition is sufficient to determine endogenously the equilibrium country market prices, matching supplies and demands. Given that our model does not represent a closed economy, the Rest of the World can have important impacts on the economy modelled. To account for such impacts we have chosen to use price linkage equations to account for the relations between the CEEC and the Rest of the World.

Here there are some important differences in the CEEC national models compared with the general modelling structure for the EU15 (see Chantreuil, Levert and Hanrahan, 2005). These main differences relate to the modelling of price linkages, CEEC price convergence with EU15 prices and the incorporation of the switch in agricultural policies in the CEEC from those in existence before accession and those in operation after accession takes place.

The general approach to the price linkage issue was to use EU key prices for both the pre-accession and post-accession period, while accounting for tariff barriers between the CEEC and the EU using dummies. However, for some countries an alternative approach using world prices as the key prices for the pre-accession period was also used, where a switch to EU prices took place once accession for a modelled country occurred.

To some degree the rate at which CEEC prices might converge towards the EU level, is still an unknown. In the modelling approach adopted for this study, the experience of previous EU accessions was taken into account. Where CEEC prices are above the EU level in the pre-accession period, then, on accession, one might expect convergence to occur quite quickly. However, where NMS prices are initially below the EU level, upward convergence of NMS prices towards EU price levels might be expected to take place more slowly. There are a number of exogenous factors that would affect the rate of price convergence, including, amongst other things, the GDP growth rate, EU internal and foreign trade developments, the level of self sufficiency in the CEEC for the product concerned, and the quality of the product produced in the CEEC relative to that of the products produced in the EU15. There is a need to pursue these issues further and this is a future objective of the project.

In the models, the different policies in operation in advance of and following accession were handled using the same policy variable construct for the pre-accession and post-accession period. A subsidy per unit value of production was calculated and added to the producer price to create a synthetic price construct – described as a ‘basic price’. Such basic prices should reflect the changes in the nature and the value of the support that is given to agriculture. For the pre-accession period the partners used the direct payments part of the PSE calculations (OECD, 2002).

After accession the NMS have two policy options before the reform of the CAP is introduced for their agricultural sectors. After accession, the majority of countries will adopt the SAPS, which it is possible to retain up until 2008. The possibility also exists to use what

might be called the 'Classic CAP', essentially Agenda 2000 type measures. However, it is likely that only Slovenia will avail of this latter option.

After this first period of transition, reform of the CAP, in the form of Single Payment Scheme (SPS) has to be implemented between 2005 and 2009 (Council Regulation (EC) N° 1782/2003). However, it is expected that the majority of countries will begin this reform at the latest feasible date. The SPS is, in economic terms, close to the SAPS concept, but will apply to different types of agricultural area and also includes some measures from the Classic CAP scheme. For the modelling task, an additional dimension to incorporate is the so called 'topping up' measure, whereby countries may provide additional resources to the agricultural sector from their own national budgets. Where topping up is applied, these additional payments will be coupled to a greater degree than SAPS and SPS measures. The precise manner in which governments in the NMS will implement all of the above policy mechanisms was unresolved at the time this modelling exercise was conducted.

CEEC can use national calculations to determine the value of area payments per hectare according to the SAPS and SPS rules and the Accession Negotiations Agreement. Partner teams employed such national data where possible. In other cases, modelling teams made their own proxy calculations for the value of such payments in their countries according to the SAPS and SPS rules.

Direct payments, which are coupled to varying degrees according to specific schemes, will impact on the market to differing degrees. When such payments are then decoupled, some of the supply inducing effect, which the payments had when they were coupled, is retained. In a manner similar to that adopted in other partial equilibrium models, this factor is taken into account in the AG-MEMOD models through the use of multipliers. This concept makes it possible to proxy the impact of specific schemes on the commodity market in question.

3. Results: Business as usual Baseline Scenario

3.1 Description of the Baseline scenario

In the modelling exercise, the purpose of the Baseline is to present a yardstick against which to measure the effect of policy changes that might be implemented. The Baseline Scenario includes a description of the Baseline set of agricultural policy assumptions, macro economic assumptions and assumptions relating to other exogenous factors. There may be time lag of a year or two in the publication of official data for many source categories. Therefore, an end point for historical data, or a start point for projections, must be agreed. In this case that end point is 2001, so all data from 2002 onward are projected from the model.

In this paper the Baseline represents agricultural policy in the CEEC as it might have existed had accession not occurred. As such it shows market outcomes in the absence of a shift in agricultural policy or enhanced economic progress in these countries – the situation that would exist if accession did not take place. This Baseline, or Non-Accession scenario is an in-

dication about the evolution of CEEC agricultural markets in the next decade and can be interpreted as a measure of how the production potential of the CEEC might evolve without initiatives provided by the CAP.

Here some of the more interesting features of the Baseline results from the models are summarised. Essentially, it is a description of the short to medium term potential of the sectors modelled, if they remained outside the EU for the next decade. The main conclusions coming from this Baseline are that a continuing re-orientation of agricultural production would take place in the future. There would be a continued increase in crop production in the CEEC and a slight increase in production in the livestock sector. Notably, the projection results indicate differences in the magnitude of the effects across the various countries modelled, which is an important attribute of the model's output. In the discussion of the Baseline, percentage changes refer to the change in production by 2010 relative to 2001.

3.2 Baseline Results - Crops

There is considerably variability in the projected path of **grain production** across the CEEC over the period to 2010. Under the Baseline, the CEEC would greatly reduce their net imports of grain, with Romania in particular providing a significant increase in its production of **wheat** (up over 50 percent) and Latvia, Lithuania, Slovakia and Slovenia also recording sizable increases. Increases in **barley** production tend to be more modest.

At the other extreme, the projections indicate that Hungarian production of wheat and barley would actually contract, with a switch into the production of much greater volumes of **maize**. Production of wheat and barley in Bulgaria would also contract and again increased levels of maize production are projected. Small reductions in barley production in Latvia and Romania are projected.

For the remaining countries the projected changes in the production of grains under the Baseline are positive and less than 10 percent. In aggregate, CEEC production increases by about 10 percent in the case of wheat and 2 percent in the case of barley. The increase in maize production is more substantial at over 30 percent, largely driven by the strong increase in production in Hungary at the expense of production of other grains. Maize returns are relatively higher than for the other grains due to higher rates of yield increase. Demand from the EU15 for livestock feed should also be a factor. Technological transfer tends to be stronger in the case of maize than in the case of wheat and barley. Quality issues may remain a factor also in the case of the other grains, especially softwheat, and this again may make maize production more attractive. In aggregate CEEC grain production is up over 15 percent on the 2001 level by 2010. The projected Baseline production of grains and oilseeds in the CEEC is illustrated in Figure 1.

4. European Enlargement

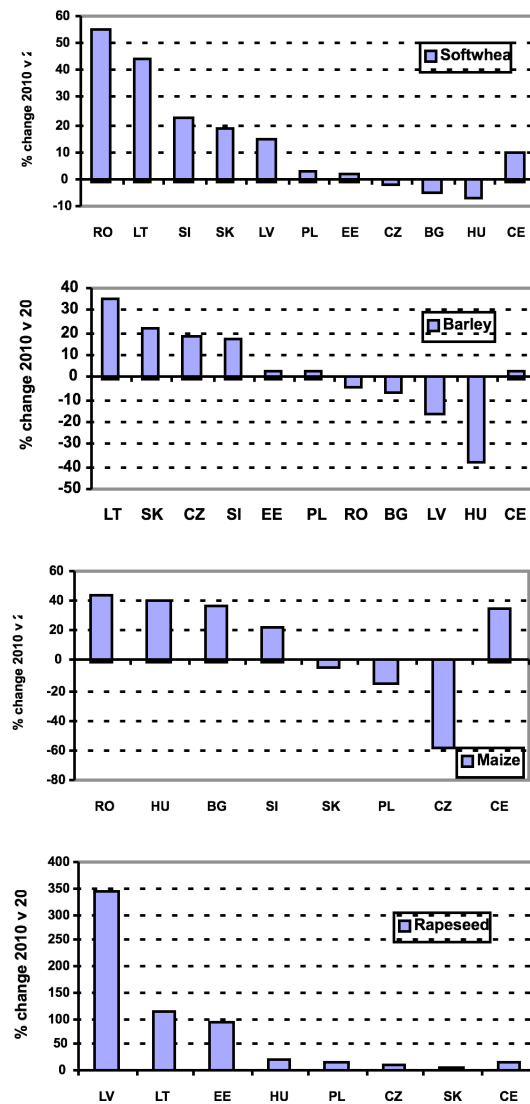


Figure 1. CEEC Grains & Oilseeds Production: Baseline Projection

Over the long term, the CEEC achieve a sizable positive balance on net exports of grains. Self sufficiency rates in maize in Hungary, which are already high, continue to increase in the Baseline projection, as do wheat self sufficiency levels in Bulgaria. Over the Baseline projection pe-

riod, Hungary and Bulgaria are by far the main contributors to the CEEC positive net trade balance for grains.

The positive CEEC grain sector Baseline outlook is explained by the fact that, in general, the CEEC grain sector is relatively competitive and that production on large scale farms, with appropriate modernisation of technology, could be economically attractive. The view of country experts is that there may be differing developments in terms of export potential, for the individual countries modelled based on increased human consumption for specific grains (soft wheat in Poland), or feed utilisation (barley in the Czech Republic and maize in Hungary) at the national level.

For **oilseeds** there are generally positive Baseline production trends in some CEEC, notably in Poland, the Czech Republic and Hungary. This is, in part, an outcome of the good industrial scale production facilities that already exist. For **rapeseed** there is extremely strong Baseline production growth projected for the Baltic States. The increase in production in Latvia is over 300 percent, with increases in Lithuania and Estonia of the order of 100 percent. Production in these countries is nevertheless much less than in Poland and the Czech Republic, which remain the main rapeseed producing countries of the CEEC. Production growth in Poland and the Czech Republic is projected to be 15 percent and 10 percent respectively, and thus, overall production growth for the CEEC is close to 18 percent. For rapeseed there is a well established industrial chain financed through foreign investment. In addition, technological production systems are facilitated by the large scale farming in this sector in the CEEC.

However, for the grains sector in particular, the results for some countries have to be examined carefully and further work on data and models is required.

3.3 Baseline Results – Livestock and Livestock Products

Projected production of beef and milk in the CEEC is illustrated in Figure 2. The overall Baseline picture for the CEEC indicates some positive growth in **beef production** would take place. The only exceptions to this outcome are Slovenia and Latvia. Strong Baseline production growth is recorded elsewhere in the Baltics, with Latvia and Estonia showing increases in production of 30 to 40 percent.

Overall, the Baseline beef results indicate that the CEEC in aggregate would produce a modest exportable surplus in the medium term, similar to that achieved in the late 1990s. However, the CEEC beef sector is under continuing pressure due to economic inefficiencies relating to its poor structure. Beef production is generally based on dual-purpose cattle, mainly used for dairy production. A lack of quality standards and problems with hygiene requirements at abattoirs, adversely affect beef production and export potential in the majority of countries. These factors limit the potential increase in production in the CEEC beef sector. The projected increase in production in some countries does not represent any real development of the sector, since it merely brings production back up towards the pre-transition level.

In beef the net trade position of the CEEC has fluctuated and the region has been both a net exporter and net importer of beef at various points in the last 10 years. For the projection period, the Baseline outlook shows a net export capacity emerging over time in Poland and

Hungary. Several other CEEC become modest net exporters of beef by the end of the Baseline projection period such that overall the CEEC could export over 10 percent of their beef by 2010 if EU Accession did not take place.

In this study, several problems arose in the modelling of the **dairy sector**, particularly with respect to data acquisition. In some countries the Baseline dairy outlook is for production to continue to recover from levels which are below that of the early 1990s. Elsewhere, aggregate production is to remain depressed as small scale producers disappear. While dairy production by larger producers does expand to offset the exit of smaller producers in most countries, there are some exceptions where aggregate production is projected to fall. An additional problem is likely to be compliance with hygiene requirements, which in some cases are likely to remain unfulfilled. The most positive medium term Baseline production prospects exist for the dairy sectors in Romania, Bulgaria, Poland and the Czech Republic. Poland is by far the largest CEEC milk producer (although much of this is for internal consumption) and Polish Baseline milk production growth is expected to be less than 10 percent.

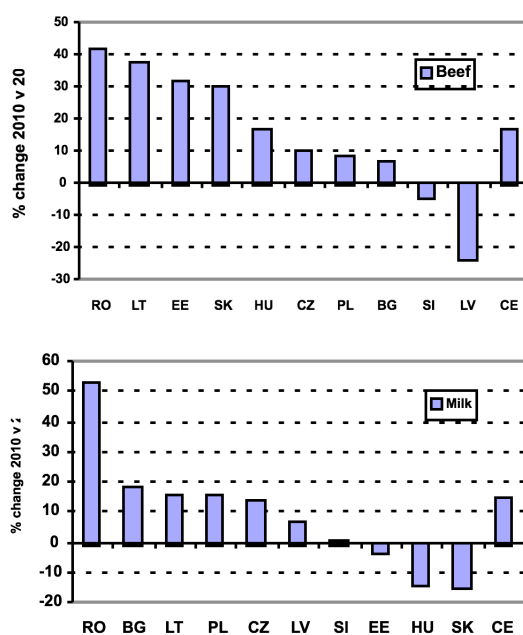


Figure 2. CEEC Beef & Milk Production: Baseline Projection

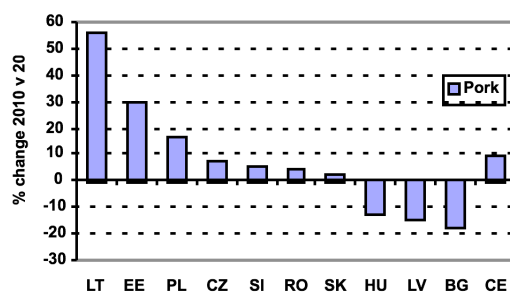
Projected production of pigmeat and poultry in the CEEC is illustrated in Figure 3. The Baseline results suggest no widespread growth in CEEC **pigmeat production** in the Baseline projection period. Pigmeat production in most of the countries modelled remains relatively stable. Only Poland, Lithuania and Estonia exhibit increases in Baseline pigmeat production that are

worthy of note. Of those three, only Poland's pigmeat production levels are substantial, so increases in production elsewhere affect overall CEEC production to only a small extent. Pigmeat production in Hungary, the other main pigmeat producer in the CEEC, is actually projected to contract in the Baseline. Overall, the pigmeat net trade position for the CEEC in aggregate remains slightly positive and Hungary and Poland remain the largest net-exporters.

Several reasons can be advanced for the modest growth in Baseline pigmeat production. Many pigmeat producers are relatively smaller in scale and the conversion of feed into meat tends to be inefficient, which, in turn, results in lower quality carcasses. The burden of raising standards in the meat production and distribution chain to meet hygiene regulations for export to the EU also hinders growth in some countries. It will take time for the CEEC to remedy this situation, hence the view that a contraction in production seems likely in some countries in the short term. However, in some countries a potential increase in Baseline pigmeat production is projected, in many cases due to a low level of existing production, but in some cases due to increased pigmeat demand, reflecting a shift by consumers away from red meat towards white meats. Further investigation of some of these projected results remains necessary.

Poland's improved net trade position in pigmeat tends to be offset by the projected contraction in net exports from Hungary. Poland may be likely to find increased export opportunities for its pigmeat in the EU15. Some countries, notably Bulgaria and Slovakia, remain net importers of pigmeat throughout the Baseline projection period. Increased domestic consumption of pigmeat also limits exportable supplies across the CEEC, however the overall pigmeat net trade position of the CEEC under the Baseline projection remains positive and increases on the 2001 level.

The Baseline outlook for **broiler production** across the CEEC is broadly positive for most of the countries modelled. Baseline production growth in Poland allows it to become a net exporter of broiler meat. This growth reflects the benefit of capital investment and restructuring which has been made in Poland and in some other CEEC. Overall, the sector should become more competitive and this should facilitate increased net exports from a number of CEEC. An important factor, which will benefit the sector, is the increasing demand from consumers for white meat. There is significant positive growth in the Baltic States, Slovakia and Bulgaria.



4. European Enlargement

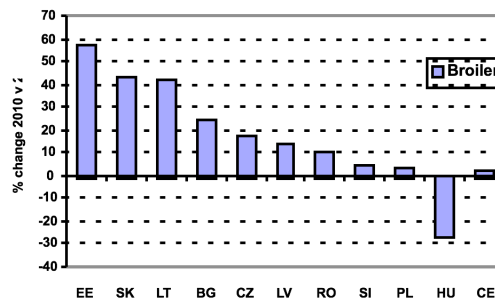


Figure 3. CEEC Pigmeat & Broiler Production: Baseline Projection

The rate of increase in broiler production in the Baltic States is particularly strong, even though production in these countries is not substantial. Surprisingly, Baseline broiler production in Hungary, by 2010, is projected to decline and the sector is no longer a net exporter of broiler meats. The poultry sector in Hungary may experience production problems in complying with EU standards in terms of poultry related welfare and sanitary legislation. These requirements may increase production costs and, without the foreign direct investment necessary to resolve this difficulty, the broiler sector in Hungary may struggle. Appropriate investment and technological progress in the broiler sector in Hungary could lead to a more favourable outlook than is projected here. Overall, the Baseline poultry projections amount to a small positive change in broiler production for the CEEC in aggregate by 2010.

3.4 Baseline Results – Domestic Use

Despite the relatively static population projections for the CEEC, higher real income levels in the presence of limited price changes, will lead to higher **human consumption** of agricultural products under the Baseline. This is particularly the case for broiler meat, pork and dairy products. Beef consumption is projected to remain relatively static.

Generally, at the aggregate CEEC level, there is a positive trend in Baseline **feed demand** reflecting the modest upward trend in Baseline livestock production. Country variations in projections of Baseline feed use generally reflect differences in the share of the type of livestock found in each of the CEEC. These feed projections will require further investigation.

4. Accession Scenario: Sample results for EU New Member States

4.1 Description of Accession Scenario

Following from the accession agreement negotiated at the Copenhagen EU Summit in 2002, the NMS joined the EU on May 1st 2004. Models for eight of these 10 states are used to produce results of the impact of this accession, based, in most cases, on the adoption of the decoupled flat rate area payment known as the Simplified Area Payments Scheme. In the accession it has been agreed that the level of direct payments will rise gradually from 25% of the EU15 payments level in 2004 to 100% in 2013. The accession countries can, to some extent, provide additional payments ('topping up') through national financing (European Union, 2003).

In June 2003, after the accession negotiations were completed, the CAP reform was decided. With the Luxembourg Agreement reform of 2003, the EU entered a new policy and budgetary era, which is to last until 2013. The objectives of agricultural policy, as well as the types of support provided, have changed. The reform introduced decoupled area payments based on the level of funds received during a defined reference period.

The 'old' and 'new' EU Member States have to implement the CAP reform in the period from 2005 to 2007. With this reform, the CAP will become less and less uniform across EU Member States. Due to the fact, that the NMS do not have an historical reference period for payments, they are compelled to adopt the regional version of the Single Payment Scheme (SPS), which implies uniform payments per hectare (although payment levels for arable crops and grassland can be differentiated). As with the measures in the EU15, it is possible to retain coupled measures for a period. From this accession and reform process we can derive two main accession scenarios:

- 1) **Accession under SAPS** (with changes in prices occurring as convergence occurs following accession in 2004) and SAPS in place until 2012. For Bulgaria and Romania this scenario starts at 2007 and is the only scenario.
- 2) **Accession and CAP Reform** (Luxembourg Agreement and special regulations for New Member States). Similar to scenario 1, but from **2007** onward the SFP (single farm payment - area payment divided in to arable aid payment and payment per hectare of permanent grassland). This scenario is examined for all CEEC, except Bulgaria and Romania.

4.2 Results from simulating the Accession Scenario – Crops

These are the first Scenario results of the AG-MEMOD model for Accession countries and as such they remain tentative, since their main purpose is to illustrate the possibilities that exist to use the model as a policy analysis tool.

The projections are based on the accession of the NMS - as of May 1st 2004 and the resultant outlook to 2010. Scenario projections for Bulgaria and Romania relate to the implementation of the SAPS only. Results are best interpreted by contrasting the projections produced under these scenarios by 2010 with the Baseline projections for 2010. By doing so we isolate the effect of the change in policy from changes that would otherwise have taken place in the sector over time.

Since these are the first steps in the analysis of these policy reforms with these models, care should be taken in interpreting the output. It is clear that there are opportunities to improve the models' projection capacity, and in particular continued work is required on the data sources and the methodology to handle the switch in payment systems brought about by Accession.

As with the Baseline, there is considerable variability in the projected path of **soft wheat production** across the NMS. While some of this can be explained by the manner in which the policy has been incorporated in the models, it is clear that differences in the competitiveness of the countries examined are reflected in the results. Under the Accession Scenario, NMS production of soft wheat shows a modest increase in aggregate relative to the Baseline position in 2010.

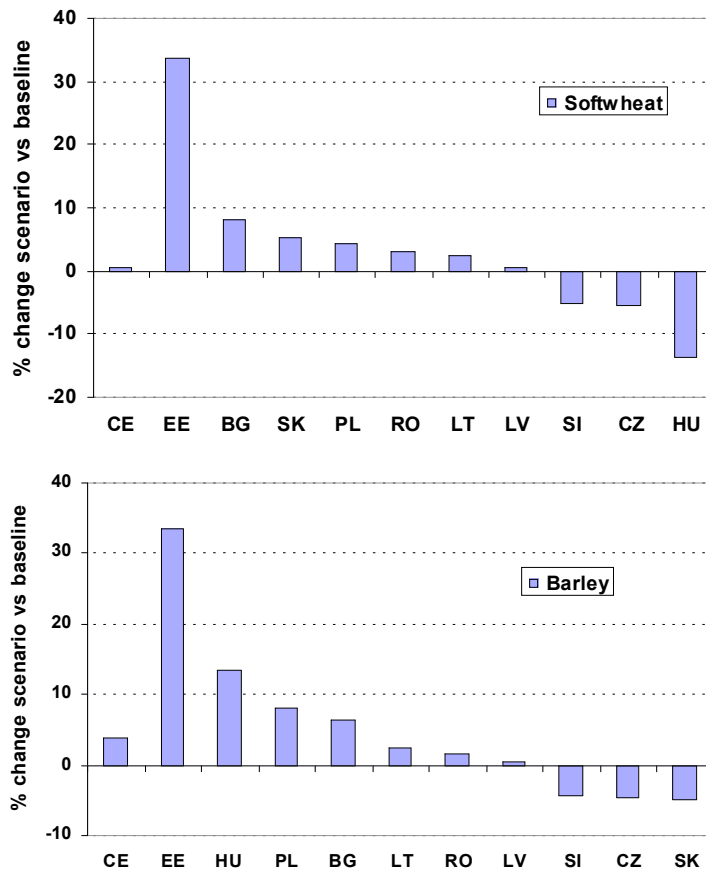
The percentage change in the projected production of grains & oilseeds relative to the Baseline in the NMS is illustrated in Figure 4. In general, crop producers will gain due to the relative increase in prices and direct payments. However, this will not lead to an increase in production of all crops. Model results reflect a trend towards greater production of oilseeds and a switch between particular grain sectors. In some of the countries modelled, there is a decrease in soft wheat production relative to the Baseline outcome, namely in the Czech Republic and Hungary, where feed grain consumption also increases. For Poland, a key large scale producer of wheat, the increase in production that is observed following accession is less than 10 percent. Romania exhibits the strongest growth in soft wheat production relative to the Baseline. Overall, for the CEEC in aggregate, there is only a marginal change in soft wheat production post-accession relative to the Baseline. Despite the slightly higher production levels under accession, CEEC net exports of wheat are a little lower than under the Baseline due to higher levels of feed use. Further exploration of the results is necessary.

Hungary and Poland, two of the larger **barley** producers in the CEEC, show increases in production after accession relative to the Baseline of 13 percent and 8 percent respectively. Barley production decreases slightly relative to the Baseline in the Czech Republic, Slovenia and Slovakia. Together the net effect of these production changes amount to an increase in NMS barley production of about 4 percent relative to the Baseline. Increased barley production contributes to a growth in net exports of barley relative to the Baseline in Poland and

Hungary, while in many of the other countries there is little change in the net exports of barley compared with the Baseline.

Under accession, production prospect for maize are better than in the case of wheat and barley, with CEEC production running 7 percent above the Baseline level by 2010. Hungary and Bulgaria are the sources of the increases in production that are most worthy of note.

Overall, grain production in the CEEC increases under accession by about 3 percent relative to the Baseline in 2010. As mentioned previously, sizable increases in CEEC **rapeseed production** are projected in many of the countries modelled under EU Accession. Under the Accession Scenario, the strongest increases relative to the Baseline are recorded in Hungary, Poland and Slovakia, with more modest growth in other countries. This result is explained by the much improved economic and structural conditions.



4. European Enlargement

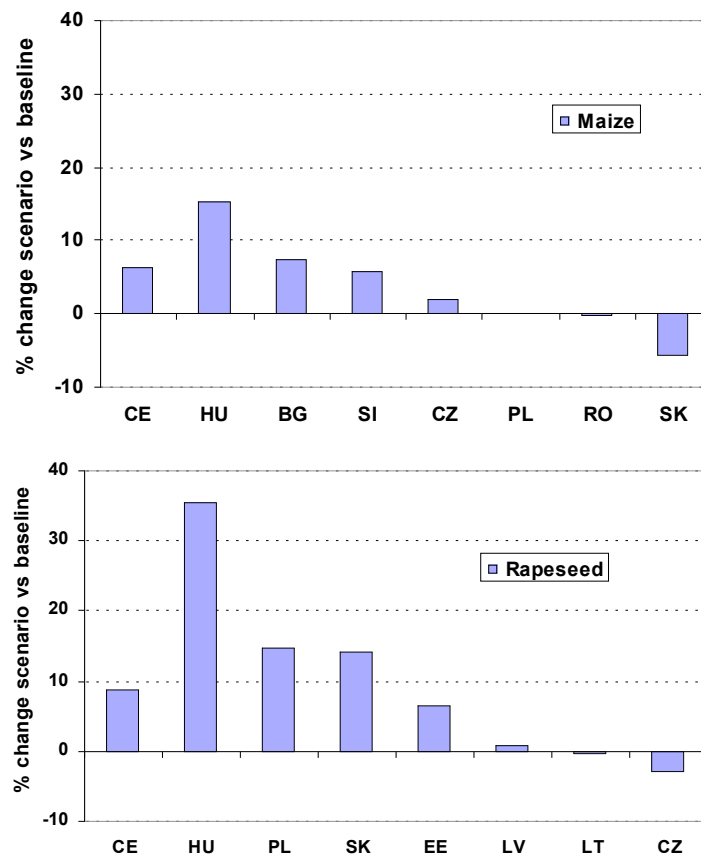


Figure 4. NMS Grains & Oilseeds Production in 2010: Accession Scenario % Change Relative to Baseline

4.3 Results from simulating the Accession Scenario – Livestock and Livestock Products

The percentage change in the projected production of beef and dairy under the Accession Scenario, relative to the Baseline, in the NMS is illustrated in Figure 5. The overall Accession Scenario projections indicate that Accession will have a positive effect on **beef production** in most NMS. The rates of increase in production are substantial in some of the NMS. Latvia, Estonia and Romania show the largest beef production increases relative to the Baseline. The respective outlooks for Romania and Bulgaria (still outside the EU in this scenario) contrast with each other, with a slight reduction in beef production projected in Bulgaria, relative to the Baseline.

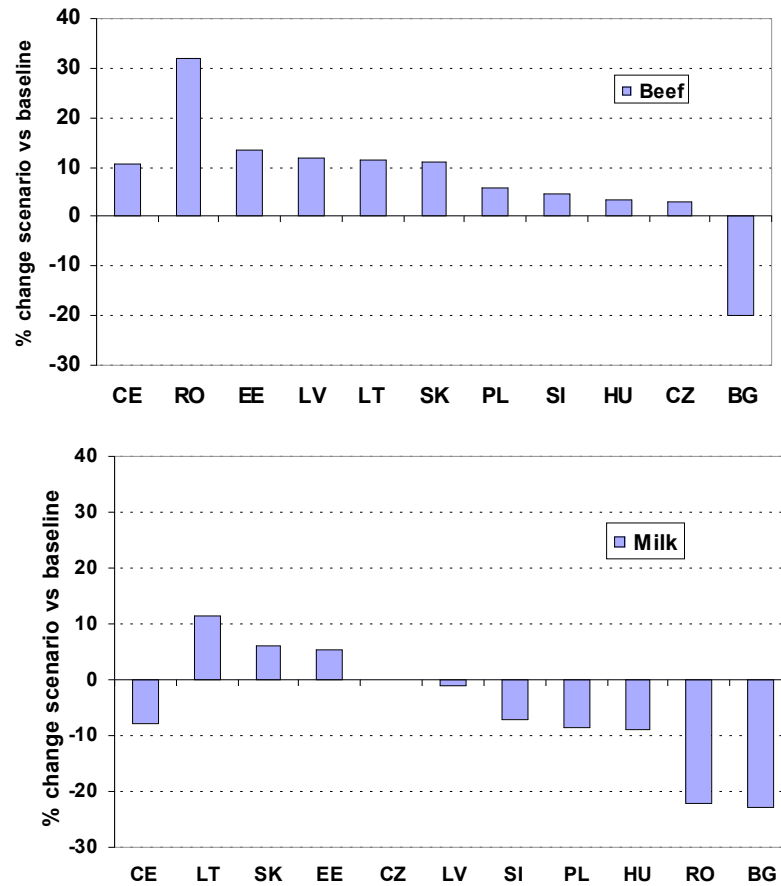


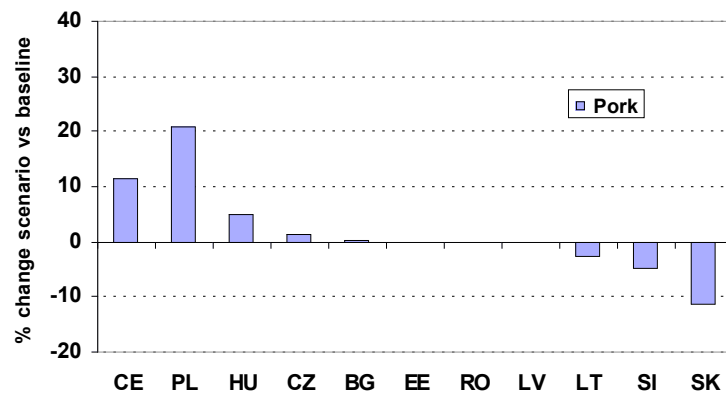
Figure 5. NMS Beef& Milk Production in 2010: Accession Scenario % Change Relative to Baseline

Overall, the results indicate that, under accession, the CEEC in aggregate would produce a small exportable surplus of beef in the medium term, but that this surplus is smaller than that projected under the Baseline due to the constraining effect that EU milk quotas have on the breeding herd. This result comes from the fact that beef production is not in a particularly strong competitive position before the Accession, but gains competitiveness through the Accession process due to price increases and the provision of additional budgetary support. Some issues with quality of beef production may remain.

In the **dairy** sector, the introduction of the milk quota under EU accession influences the milk production in the CEEC to differing degrees, depending on whether or not there is some slack in the reference quantity secured under Accession. In general, production changes are

small and Accession should support the restructuring in the milk sector. Production is lower under Accession than in the Baseline in several countries suggesting that the milk quota and other market developments will have a constraining effect in these countries. Overall, CEEC milk production is down by about 8 percent relative to the Baseline. Of the Accession countries, Poland and Hungary show the greatest reduction in milk production under accession relative to the 2010 Baseline position. The production of cheese and milk powder may gain in importance in the CEEC as market opportunities across the EU increase. Some sanitary and quality issues can be expected in the short term and over the longer term the competitiveness of the dairy sector in the CEEC may be questionable.

The percentage change in the projected production of **pigmeat and broiler meat** under the Accession Scenario relative to the Baseline in the NMS is illustrated in Figure 6. The Accession Scenario results suggest an increase in NMS **pigmeat** production relative to the Baseline in the projection period of over 10 percent. However, production in some of the countries modelled declines relative to the Baseline, namely Latvia, Slovakia, and Slovenia. This is explained by the relatively high level of pork prices in advance of the accession. In many of the NMS, prices for EU15 quality carcasses were above those of EU-15 exporters before accession.



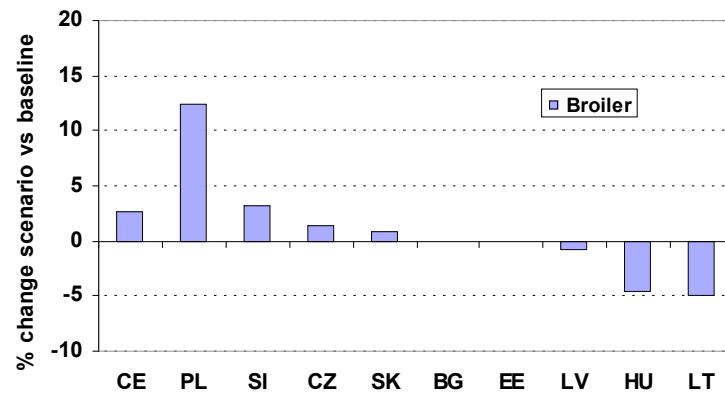


Figure 8. NMS Pigmeat Production in 2010: Accession % Change Relative to Baseline

Under the Accession Scenario, pigmeat production remains at about Baseline levels in Bulgaria, Romania, Estonia and Latvia. Growth prospects are more promising in Hungary and particularly in Poland, where an increase of 20 percent relative to the Baseline is projected. A slight increase in net exports of pigmeat is projected, but increased domestic consumption limits export capacity. Accession will bring more competitiveness threats where domestic pig production has problems addressing quality and price issues.

Broiler production under EU accession shows notable growth in the long term in a number of the CEEC, most notably in Poland. Surprisingly, the results indicate that production may fall in Hungary, which historically has been a major net exporter of broiler meat. For the CEEC, under accession, an aggregate increase in production of 3 percent over the Baseline level is projected. Considerable investment undertaken in tandem with the accession should improve broiler production and processing facilities in most countries. However, competition from the EU-15 after accession could, in the short term, negatively affect NMS broiler production. Again, as mentioned in the discussion of the Baseline, the outlook for poultry production in Hungary could be better if foreign direct investment is available to resolve production difficulties in the Hungarian poultry sector.

5. Conclusions

This paper has outlined the progress that has been made in developing country level models for the agriculture sectors of the CEEC, covering most of the NMS and those who will accede to the EU in the short term. The work represents a positive development in the analysis of the impact of agricultural policy changes for the countries that are modelled. Estimates of policy impacts that are based on a rigorous factual basis already exist from models developed to analyse agriculture in the 'old' EU. Similarly, the models developed here provide an alternative to

projections which already exist, many of which are based on expert opinion or the extrapolation of trends.

The overall **Baseline outlook** suggests generally positive trends in terms of production for the CEEC. There is a re-orientation towards crop production and the CEEC greatly reduce their net grain import requirement. For the most part, Baseline livestock production experiences only modest growth and production levels are comparable with those achieved in the pre-transition period.

For some products, notably beef and maize, there is an improvement in the net trade position under the Baseline such that the CEEC becomes a net exporter of these commodities. The most positive growth trends would occur in the Baltic States, Slovakia, the Czech Republic and Poland. Production prospects across several sectors in Hungary are generally less favourable. The CEEC becomes a net importer of broiler meat in the Baseline projection period due to the projected reduction in broiler production in Hungary.

Under the **Accession Scenario**, the NMS gain in particular from higher prices and budgetary support in some sectors (industrial crops, beef). Accession supports the orientation towards crop production and the CEEC becomes a net exporter. Projections under accession for most sectors show real improvements when measured against recent production levels, but these projections should also be compared with historical production levels achieved in the late 1980s and early 1990s. For the most part livestock production would benefit from Accession, with beef and pigmeat being the meat sectors most likely to exhibit appreciable growth, driven by the higher post-accession prices. Production growth in the dairy sector is more limited under the Accession Scenario than under the Baseline, since the sector is subject to quotas in the scenario.

At country level the significant variations in projected outcomes for commodity production are interesting, both from a research and a policy perspective. These results, which are model based, may challenge those already available from other sources, many of which tend to be based on the extrapolation of past trends or a reflection of expert opinion. The scope of this paper does not allow a detailed discussion of specific country level results, but a crude summary would indicate that the most positive growth trends would occur in the Baltic States, Slovakia, the Czech Republic and Poland while production prospects across most sectors in Hungary are generally less favourable.

Particularly in the case of accession to the EU, it is not possible to say with total certainty how quality differences and sanitary requirements will effect the development of the sectors. Quality and sanitary issues may persist into the future or there may be convergence in a relatively short period of time. The rate of progress in this area may affect the outcome for several sectors in CEEC agriculture in the medium term. Similarly, the rate at which technological progress is transmitted through the NMS agricultural sectors is likely to change with Accession, but it is difficult to be totally confident about the speed of adoption of new technology. Again, this uncertainty may affect the projected path for some CEEC agriculture sectors.

These first results remain tentative and further investigation with the aim of improving the model design and engaging country experts in more detailed reviews of the output is warranted. In addition, the methodology that has been developed to incorporate decoupled payments should be extended.

The potential for future analysis of relevant policy issues (Commodity outlooks, WTO reform, and further reform of the CAP) is clear. Future steps will focus on the completion of the models and their preparation for CAP reform policy analysis, further updating of the models' datasets and further development of the methodology used.

Additional goals would see the continuation of the network that has already been established so that these models can be migrated to a suitable platform to allow their combination with models for the EU15. This would facilitate EU25 policy analysis at country specific level. The development of similar models for countries identified for future accessions, as well as models for trade relevant countries neighbouring the EU, would also be a priority.

Note

This policy analysis tool, which began development in 2003, is an output of the AGMEMOD Partnership, a pan EU consortium of institutes drawn from almost of the Member States of the 'old' and 'new' EU established under contract N° QLK5-CT-2000-00473. The authors would like to thank their AGMEMOD partners for the contribution to this work.

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