

# CEEC agricultural markets and EU accession

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## Abstract

The modelling tools used to simulate the effects of agricultural policy changes in New Member States (NMS) of the EU and first results of a modelling exercise are presented and discussed. AG-MEMOD partial equilibrium models are used to simulate the effects of policy change scenarios such as EU accession as well as other policy developments and external conditions like changes in exchange rates or economic growth rates. NMS gain in particular from higher prices and budgetary support. Projections for most sectors show real improvements when measured against recent production levels, but less so when compared with historical production achieved in the late 1980s and early 1990s. EU Accession supports the orientation towards crop production where the CEEC becomes an important net exporter. Scenario results indicate that, in aggregate, the CEEC agriculture sector would have less favourable growth potential if it were to remain outside the EU and retain the policy instruments in place in advance of Accession.

**Keywords:** EU Enlargement, Market effects, CEEC agriculture

## 1. Introduction

After a structural break that saw a decline in the agriculture sector of the CEECs, a recovery in production has since occurred in the crop sector, and, to a lesser extent, in livestock production (OECD, 2002). Scope to describe the agricultural policies in place in the CEECs before accession is limited. Generally, the norm was to have different (and generally lower price) support mechanisms and less intensive

budgetary support (OECD, 2002) that was available in the EU15. Budgetary support mechanisms in the CEECs 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. Policies such as area and headage payments, market support interventions and supply constraints, were introduced prior to EU Accession and operated to different degrees across countries.

Accession to the EU will change the economic environment for agriculture in these countries significantly (MÜNCH, 2000, BANSE, 2000, EC, 2002). Commodity price convergence towards EU15 levels, driven by the introduction of price support mechanisms and followed by the introduction of Single Area Payments (SAPS) - except for Slovenia and Malta, which will have an AGENDA 2000 standard scheme - will be experienced across CEEC agricultural sectors. Although these payments are de-coupled, they could still induce 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 in line with the Accession Negotiation Agreement (EC, 2003c) will be a further step towards integration of these countries into the CAP.

This paper sets out the development of the AG-MEMOD Partnership's approach for the analysis of agricultural policy changes for countries of Central and Eastern Europe (CEEC). Ten teams, drawn from institutes across the CEECs 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 1<sup>st</sup> 2004. In addition, there is also coverage of Romania and Bulgaria, the next countries in line to join the EU.

The focus of the paper is to examine the agricultural commodity level production and trade potential of the CEECs under differing policy assumptions. Firstly, the models are used to examine a counterfactual state of world (referred to as Baseline) which projects the production and trade outcome over time if Accession did not occur. Separate sets of projections then examine the production and trade outcomes under EU Accession. The projected outcome under EU Accession can be

contrasted with the Baseline to provide a measure of the impact of Accession on the agricultural commodities examined.

The paper is structured into four sections. Following this introduction, Section 2 provides some background to the methodological approach applied together with scenario assumptions. Main results obtained are presented in Section 3. Finally, the conclusions that are drawn from the research are presented in Section 4.

## **2. Modelling Approach and Background**

Partners have built their models using a common AG-MEMOD framework that has facilitated their aggregation to provide results for the CEECs. The AG-MEMOD country models are econometric, dynamic, multi-product, partial equilibrium commodity models. 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.

The model projects production, domestic use, trade and stock levels in terms of animal numbers, and also projects production, domestic use, trade and stock levels for the various meats. Projections for crop areas and yields allow the projection of crop production volumes. Projections of domestic use, trade and stock levels in crops are also produced. Currently projections from the model extend to 2010, although the model can be further adapted to provide projections over a longer time horizon, such as 2015 or 2020.

The model captures the supply and demand interdependency among agricultural products. Price and policy related supply and demand responses can be built in as can exogenous variables such as changes in technology, population, income and consumer preference trends.

Lagged transmission and adjustment processes over time such as exist in the livestock breeding cycle can be incorporated over time. (BINFIELD et al., 2001)

The aim for the CEEC modelling teams was to provide a level of commodity coverage as wide as is feasible, given the data available. In general, coverage include at the end grains (soft wheat, barley, maize, optional also rye, oats and durum wheat), oilseeds (rapeseed, sunflower and soya), livestock (cattle, pigs, poultry and optional sheep

and goats) and livestock products (milk, cheese, butter, skimmed milk powder and whole milk powder). Some partners also included potatoes as an additional commodity. The annual data were obtained from national statistics and national academic databases in addition to New-Cronos and OECD databases as well as FAPRI forecasts. To date the extent of country level modelling work of a similar nature has been relatively limited, possibly because of the onerous requirements involved in developing a suite of county level models of this kind. The FAPRI EU GOLD model (HANRAHAN, 2001) is already capable of producing projections for specific countries within the EU15 and more recent adaptations allow projections for some of the NMS. (BINFIELD et al., 2006). The estimation of the model parameters follows the general rules provided for in the AG-MEMOD modelling approach (HANRAHAN, 2001).

The econometric approach is generally used to give the initial values for the regression coefficients used in the models. Scope to use econometric estimation is limited by data availability and data relevancy. Given that the data is annual, some series are not long enough to allow meaningful estimation, particularly in the period before market economies became established. Data relevancy is a particular issue where there are structural breaks in policy. Generally data prior to 1990 has not been used for estimation purposes and calibration techniques were employed.

In performing the accession analysis, modellers have looked at the process of linking farm and commodity prices in Accession Countries to those in EU-15 markets. 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'. In this paper the Baseline represents agricultural policy in the CEECs 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 (N-Ac) scenario is an indication 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 CEECs might evolve without initiatives provided by the CAP. From this accession and CAP reform process we can derive two main accession scenarios: **1) Accession under SAPS** (with

convergence of prices following accession in 2004) and SAPS in place until 2012. For Bulgaria and Romania this scenario starts at 2007 and is the only scenario simulated. **2) Accession and CAP Reform -SFP** (Luxembourg Agreement and special regulations for New Member States). Similar to scenario 1, but from 2007 onward the SFP (area payment divided into arable aid payment and payment per hectare of permanent grassland). The further description of the modeling approach and functional specification of the econometrically estimated equations of the AG-MEMOD country level models is reported by ERJAVEC et al. (2005). Specific country level analyses have also been produced by AG-MEMOD partners. (ERJAVEC and KAVČIČ, 2005, ESPOSTI and LOBIANCO, 2004).

### 3. Results and discussion

The projected production of grains and oilseeds in the CEEC is presented in Table 1. There is considerably variability in the projected path of *grain production* across the CEECs over the decade. However, under the Baseline, the CEECs would greatly reduce their net imports of grain. 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. The positive grains sector 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. Also for *oilseeds* there are generally positive production trends in some countries, notably in Poland, the Czech Republic and Hungary. This is, in part, an outcome of the good industrial scale production facilities that exist.

In general after accession, 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 the greater production of oilseeds. In some of the countries modelled, there is, therefore, a decrease in soft wheat production relative to the Baseline outcome, namely the Czech Republic and Hungary.

Table 1: Aggregate results for grains and rapeseeds

	Total grain (000 t)			Soft wheat (000 t)			Maize (000 t)			Barley (000 t)			Rapeseeds (000 t)		
	2001	2010	2010	2001	2010	2010	2001	2010	2010	2001	2010	2010	2001	2010	2010
	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP
<b>Production</b>															
Bulgaria*	5879	5975	6431	4077	3910	4222	872	1190	1277	930	874	932			
Czech Republic	6850	6919	6570	4476	4412	4166	409	179	183	1966	2328	2220	973	1071	1040
Estonia	446	455	609	133	135	180	0	0	0	270	277	370	41	80	85
Hungary	14354	16766	17893	5197	4867	4195	7858	11081	12769	1299	818	929	205	244	330
Latvia	864	875	878	424	486	488				242	206	207	14	61	61
Lithuania	2084	2933	3005	1076	1549	1587				776	1050	1075	65	139	138
Poland	18548	18752	19434	9225	9529	9935	1362	1178	1178	3252	3330	3605	925	1057	1214
Romania*	15334	21828	22053	4455	6903	7125	9296	13386	13336	1584	1540	1564			
Slovakia	3305	3779	3819	1894	2239	2359	725	703	664	685	837	796	240	254	289
Slovenia	568	689	702	167	204	193	359	436	462	42	49	47			
CEE Countries	68231	78972	81392	31124	34234	34452	20880	28153	29895	11045	11310	11744	2464	2906	3158
<b>Net trade</b>															
Bulgaria*	351	2132	2754	420	1790	2169	-78	-82	76	9	423	508			
Czech Republic	34	1178	866	64	825	593	-16	-88	-88	-13	442	360	356	404	372
Estonia	-48	-147	-36	-2	-38	2	0	0	0	-25	-70	-13	-17	15	21
Hungary	3027	7990	9122	1515	1992	1162	1563	5968	7887	-51	30	74	35	108	185
Latvia	18	132	138	30	173	176				-31	-47	-43	10	56	57
Lithuania	371	215	64	395	407	368				-31	-155	-248	34	112	111
Poland	-828	-915	-756	-208	-282	-601	-100	-146	-39	-199	-196	206	100	60	195
Romania*	-98	-187	-189	-275	-328	-334	165	159	162	13	-18	-18			
Slovakia	-133	191	321	-136	202	418	30	-170	-211	-26	159	114	80	52	114
Slovenia	-473	-407	-369	-122	-84	-93	-265	-225	-179	-87	-98	-97			
CEE Countries	2221	10183	11913	1680	4657	3862	1298	5415	7608	-440	473	843	599	807	1055

\*SAPS, other SFP

Table 2: Aggregate results for livestock (\*SAPS, other SFP; \*\* Cheese in net trade)

	Beef and veal (000 t)			Cow milk** (000 t)			Pork (000 t)			Poultry (000 t)		
	2001	2010	2010	2001	2010	2010	2001	2010	2010	2001	2010	2010
	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP	N-Ac	N-Ac	SFP
	<b>Production</b>											
Bulgaria*	59	63	50	1253	1483	1146	183	153	153	105	130	130
Czech Republic	209	229	235	2702	3067	3067	584	628	636	312	366	371
Estonia	4	19	21	684	664	700	34	43	43	9	14	14
Hungary	56	65	67	2095	1809	1649	346	304	320	466	344	329
Latvia	24	18	20	835	892	881	27	24	24	9	10	10
Lithuania	47	65	73	1730	2007	2236	72	113	109	30	42	40
Poland	335	362	384	12503	14475	13250	2010	2337	2822	381	393	442
Romania*	200	284	375	2957	4512	3520	395	412	412			
Slovakia	38	50	55	1147	978	1036	155	158	140	92	132	133
Slovenia	49	47	49	624	628	583	68	71	68	57	60	62
CEE Countries	1031	1201	1329	26529	30517	28068	3874	4244	4728	1461	1492	1532
	<b>Net trade</b>											
Bulgaria*	-15	1	-12	7	11	-16	-22	-69	-69	-12	-13	-13
Czech Republic	35	16	-13	9	13	71	-8	6	0	-4	19	24
Estonia	-2	-1	3	4	4	4	-4	2	1	-9	-9	-10
Hungary	19	38	40	9	48	47	84	25	40	113	-40	-57
Latvia	-7	-9	-7	1	8	12	-30	-31	-32	-16	12	
Lithuania	2	7	24	34	45	68	-6	-11	-23	-9	-10	-15
Poland	-14	49	18	9	19	22	93	293	329	4	2	19
Romania*	-18	28	110	0	0	0	9	10	10			
Slovakia	2	1	22	6	10	17	-13	-33	-96	-10	-8	6
Slovenia	6	8	10	-1	-2	-2	-5	-4	-9	8	5	6
CEE Countries	8	138	194	78	158	223	98	188	49	9	-70	46

The overall Baseline picture for the CEEC indicates some positive trends in *beef* production (Table 2). However, this sector is under continuing pressure due to economic inefficiencies relating to its poor structure. The Baseline results suggest no widespread growth in CEEC *pig meat* production. Production in most of the countries remains relatively stable. Overall, the pig meat net trade position for the CEEC in aggregate remains slightly positive and Hungary and Poland remain the largest net-exporters. The Baseline outlook for *broiler* production across the CEECs is positive for most of the countries modelled. This growth reflects the benefit of capital investment and restructuring which has been in some CEECs.

The overall CEEC Accession Scenario production projections relative to the Baseline is shown in Figure 1. It illustrates that Accession will have a positive effect on NMS *beef* production in most Member States. The rates of increase in production are substantial in some of the NMS. Overall, the results indicate that the CEEC in aggregate would produce a small exportable surplus of beef in the medium term but this surplus is smaller than projected under the Baseline due to the constraining effect that EU quotas have on the breeding herd. The Accession Scenario results suggest also an increase in NMS *pig meat* production relative to the Baseline of almost 10 percent. However, production in some of the countries modelled declines relative to the Baseline. This is explained by relatively high level of pork prices in advance of the accession. A slight decrease in net exports is projected since increased domestic consumption limits export capacity. The *broiler* production shows notable growth comparing with Baseline in a number of the CEECs. Surprisingly, the results indicate that production may fall further in Hungary, which historically has been a major net exporter of broiler meat. For the CEECs in aggregate an increase in production of 3 percent above the baseline is projected. However, competition from the EU-15 could, in the short term, negatively affect NMS production.

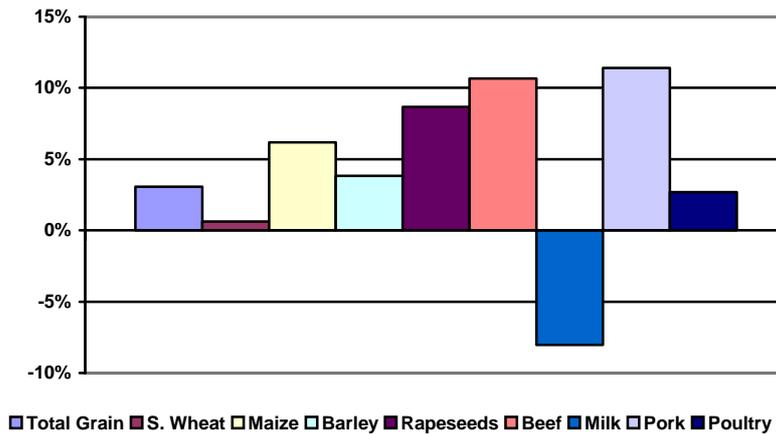


Figure 1: CEEC Commodity Production: Percentage difference in SFP projection in 2010 relative to N-Ac projection in 2010

Several problems arose in the modelling of the *dairy* sector particularly with respect to data acquisition. In some countries the Baseline outlook for production indicates it will continue to recover from levels which are below that of the early 1990s. Elsewhere production is to remain depressed as small scale producers disappear. The introduction of milk quota system under EU accession influences the milk production in CEEC countries 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.

#### 4. Conclusions

The outlook indicates that farmers in the NMS gain from higher prices and budgetary support. Projections for most sectors show real improvements when measured against recent production levels, but

less so when compared with historical production levels already achieved in the late 1980s and early 1990s. Accession supports the orientation towards crop production where the CEEC becomes an important net exporter. Also livestock production would benefit from Accession, with beef and pork being sectors most likely to exhibit appreciable growth driven by the higher post accession prices. Production growth in dairy sector is more limited under the accession scenario than under the baseline due to milk quotas' introduction. Scenario results indicate that, in aggregate, the CEEC agriculture would have less favourable growth potential if it were to remain outside the EU and retain the policy instruments in place in advance of Accession.

The significant variations in projected outcomes for commodity production at country level are interesting both from a research and a policy perspective. These results, which are model based, may challenge those already available from other sources. 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, Czech Republic and Poland, while production prospects across most sectors in Hungary are generally less favourable. These first results remain tentative and further investigation to improve 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.

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