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The CAP's Impact on Agriculture and Food Demand in Central European Countries after EU Accession: Who Will Lose and Who Will Gain?

INTRODUCTION

The population of Central European countries (CECs) is becoming less enthusiastic about European Union (EU) accession than was the case immediately after the fall of the Iron Curtain. It is feared that consumers will have to pay higher food prices. National agricultural policies of most CECs are less protective than the Common Agricultural Policy (CAP). Its implementation is therefore expected to lead to adjustments in farm production, farm incomes and consumer welfare. Farmers in CECs are concerned about growing competition from Western Europe.

The 'Central and Eastern European Countries Agricultural Simulation Model' (CEEC-ASIM) (Frohberg *et al.*, 1997) is used to assess these impacts for Poland, the Czech Republic, Hungary, Estonia and Slovenia (CEC-I), the potential first-wave accession countries. In this paper a scenario of EU accession under full application of the EU market regulations is compared with one of unchanged national agricultural policies.

BRIEF DESCRIPTION OF THE MODEL

CEEC-ASIM is a partial equilibrium model with rational and perfectly informed economic agents and perfect markets. The supply and input demand equations are derived from a symmetric generalized McFadden profit function (Diewert and Wales, 1987), which fulfils all theoretical conditions implied by the assumption of profit-maximizing producers using multi-input and multi-output technologies. The demand equations are based on a normalized quadratic expenditure function (Diewert and Wales, 1988) assuming utility-maximizing consumers. The appropriate curvature conditions are imposed on these systems.

Price transmission equations establish links between the various price definitions at the different levels of the market chain. Policy variables like nominal protection rates, minimum prices and subsidies are part of the price transmission equations. Retail prices are linked to farmgate prices by exogenous retail

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margins. By assumption, domestic production and demand have no influence on international prices (small, open-economy, hypothesis). Quantity control policies like quotas and set-aside, which result in divergences between shadow prices and financial prices, are also implemented in the model.

For each of the accession candidates, one country model has been specified. It covers the supply of 12 primary agricultural commodities, the use of five intermediate inputs and agricultural labour input. The parameters of the supply and demand equations are calibrated so as to reproduce the base year (1997). The data sources are from FAO, OECD and national statistical services.

SCENARIO ASSUMPTIONS

A so-called *base-run* reflects a scenario of unchanged national agricultural policies (the situation of 1997). It serves as a reference for comparison with various policy scenarios. In the *EU accession scenario*, policies in the CEC-I are changed in order to apply the CAP market regulations as reformed by the Agenda 2000 decisions of the European Council of March 1999. It is assumed that, by the year 2007, the CEC-I will have fully implemented the CAP and that economic adjustments to these policy changes will be completed.

Base run: unchanged national agricultural policies

The changes in border prices between 1997 and 2007 are exogenous and are based on world market price projections of FAPRI (1999). The *nominal rate of protection* is defined as the percentage gap between farmgate and border prices. For the base run these rates are assumed to be those observed for 1997. The assumptions on autonomous *technical progress* are derived from the European Commission (1998) and reflect per hectare yield changes and per animal output changes, respectively. The annual rates of technical progress are mainly in the range of 1 to 3 per cent. Population and income growth are based on FAPRI (1999) projections.

EU accession scenario: Agenda 2000

For *farmgate prices* of cereals, sugar, beef and milk, it is assumed that policy-induced gaps between the joining countries and the EU are abolished. The price cuts of the Agenda 2000 of 15 per cent for cereals and milk and 20 per cent for beef are taken into account. If the farmgate prices calculated according to these assumptions are lower than the border prices, the latter are used as farmgate prices. This implies that negative protection is not allowed. For all other products, no border protection is in effect after EU accession (zero nominal protection rates).

The *area payments* for cereals amount to EURO 63/t. The reference yields used to calculate the payment per hectare are the average expected yields for wheat and coarse grains in 2001. For oilseeds and set-aside the same premium is received. Farmers are obliged to set aside 10 per cent of the area for 'grandes

cultures' (cereals and oilseeds, though protein crops are not explicitly covered by the model). This rate is modified to a lower effective one to reflect the small producer regulation exempting non-professional producers from the obligation. The *premium in the beef sector* is EURO290 per slaughtered male adult beast (special premium plus slaughter premium). The upper limit for the number of eligible animals is assumed to correspond to the base year's number of animals. For *milk*, a premium of EURO17.24 per ton is paid.

For the accession scenario, *production quotas* are implemented. Sugar and milk production are not allowed to exceed the 1997 levels augmented by the expected rises up to 2001 of per hectare yields and per cow yields, respectively. For milk, an additional 1.5 per cent increase in the quota reflecting the Agenda 2000 decisions is taken into account.

RESULTS

Prices

Adjusting support provided to CECs' farmers to that which the EU offers its agricultural producers changes the level and pattern of price support. Farmgate prices for many products fall to border price levels or come close to them. This is the case for wheat, potatoes, oilseeds, vegetables, pork, eggs and poultry. Sugar, milk and beef, however, become heavily protected. These changes in protection patterns lead to new relative incentive prices which turn less favourable for potatoes, vegetables, pork, eggs and poultry, whereas they become more favourable for coarse grains, oilseeds, sugar beet, milk and beef (Table 1). The 'incentive prices', in this context, take into account farmgate prices plus some fractions of subsidies (direct payments, compensatory payments, input subsidies) which are assumed to influence producers' decisions.

Production, input use and demand

For crops the production adjustments due to EU accession are small (see Table 2). Total grain production and oilseed production decrease slightly as compared with the base run because of the set-aside obligation, the effect of which, however, is weakened by the small producer regulation. Within grains wheat is substituted for by coarse grains because their relative price is higher. This also reflects the reference situation of unchanged national agricultural policies in which wheat in CEC-I is more heavily protected than coarse grains. The relative incentive prices for sugar production rise strongly owing to high EU price support. But sugar output is restricted by the EU quota system.

In the livestock sector the marked changes in relative prices as well as the milk quota lead to significant adjustments in production structures. Compared with the base run, output of pork, poultry and eggs falls strongly (see Table 2) reflecting the fading out of price support for these products under the CAP. On the other hand, with relatively high border protection and direct subsidies for beef and milk, there are strong incentives for producers to increase output of

TABLE 1 *Relative producer incentive prices, CEC-I*

	1997	Base run 2007	Agenda 2000 2007	
	Wheat = 1	Wheat = 1	Wheat = 1	Deviation from base run (%)
Wheat	1.00	1.00	1.00	0
Coarse grains	0.79	0.69	0.83	21
Potatoes	0.36	0.36	0.31	–13
Oilseeds	1.64	1.35	1.58	17
Sugarbeet	1.58	1.37	1.91	40
Vegetables	0.83	0.82	0.75	–9
Milk	1.40	1.27	1.74	37
Beef	12.68	14.84	21.01	41
Pork	10.15	12.01	9.05	–25
Eggs	9.04	9.16	5.46	–40
Poultry	9.61	9.74	5.39	–45
Rest of agricultural output	7.79	7.73	7.05	–9
Fodder wheat	0.88	0.88	0.70	–20
Fodder coarse grains	0.71	0.61	0.57	–8
Fodder potatoes	0.25	0.24	0.21	–13
Fertilizer	2.04	1.69	1.54	–9
Rest of intermediate input	7.79	9.47	8.63	–9
Labour	1.99	3.54	3.23	–9

Sources: OECD, national statistics, own calculations carried out with CEEC-ASIM.

these two products. However, the milk quota has a dampening impact on milk output. The effect of the milk quota on beef depends on how strongly the two products are combined in production. The assumption in the model simulation is that farmers would react to milk quotas by setting up more independent beef production methods.

Use of cereals and potatoes for fodder declines because of lower livestock output after EU accession (Table 3). Wheat gains more importance within the feed mix since its price ratio vis-à-vis coarse grains is reduced. Input use of fertilizer and other intermediate inputs falls slightly. This is also the case for labour. The rather small reduction of labour input might be surprising in view of the relatively strong decline in production quantities. Owing to the fact that small-scale farming plays an important role in CEC farm sectors (in particular in Poland), this can, however, be explained by a relatively low intersectoral mobility of agricultural labour.

The impact of EU accession on non-agricultural demand for crop products is modest. Only for sugar is a significant drop in consumption expected as a result of the increase in sugar prices (Table 4). Stronger effects with opposite

TABLE 2 *Production quantities,[1] CEC-I*

	1997	Base run 2007	Agenda 2000 2007	
	1000t	1000t	1000t	Deviation from base run (%)
Wheat	15 480	19 102	17 547	–8
Coarse grains	27 807	33 301	32 952	–1
Potatoes	17 249	20 325	19 982	–2
Oilseeds	1 657	2 398	2 327	–3
Sugar	3 160	3 477	3 336	–4
Vegetables	6 780	7 887	7 898	0
Milk	16 490	17 995	17 778	–1
Beef	720	727	949	31
Pork	3 086	3 364	3 066	–9
Eggs	745	795	733	–8
Poultry	1 098	1 150	968	–16
Rest of agricultural output[2]	7 169	7 545	7 512	–0

Notes: 1 Production is net of waste and seed; for milk, net of waste and feed use.
2 EURO thousands at 1999 prices.

Sources: FAO, national statistics, own calculations carried out with CEEC-ASIM.

TABLE 3 *Agricultural input use, CEC-I*

	1997	Base run 2007	Agenda 2000 2007	
	1000t	1000t	1000t	Deviation from base run (%)
Fodder wheat	6 991	6 940	7 329	6
Fodder coarse grains	22 755	25 115	24 624	–2
Fodder potatoes	9 726	10 351	9 292	–12
Fertilizer	2 256	2 255	2 214	–2
Rest of intermediate input[1]	10 351	10 140	10 045	–1
Labour[2]	4 955	4 841	4 764	–2

Notes: 1 EURO thousands at 1999 prices.
2 Employees, thousands.

Sources: FAO, OECD, national statistics, own calculations carried out with CEEC-ASIM.

TABLE 4 *Demand for agricultural products, CEC-I*[1]

	1997	Base run 2007	Agenda 2000 2007	
	1000t	1000t	1000t	Deviation from base run (%)
Wheat	6 899	7 110	7 190	1
Coarse grains	3 962	4 120	4 136	0
Potatoes	7 672	7 897	8 068	2
Oilseeds	2 217	2 381	2 411	1
Sugar	2 332	2 481	2 311	–7
Vegetables	6 613	7 420	7 559	2
Milk	16 319	18 070	15 962	–12
Beef	685	693	462	–33
Pork	2 753	2 800	3 055	9
Eggs	739	913	1 106	21
Poultry	1 003	1 260	1 665	32
Rest of food expenditure[2]	12 190	16 726	16 941	1

Notes: 1 Human consumption, processing and industrial use.
2 EURO thousands at 1999 prices.

Sources: FAO, national statistics, own calculations carried out with CEEC-ASIM.

sign are expected for livestock products. The price cuts for pork, poultry and eggs lead to higher consumption levels compared to the base run. Milk and beef consumption, on the other hand, strongly declines because of higher retail prices after EU accession.

Welfare effects

As a result of EU price support and direct subsidies, income from agricultural activity in CEC-I rises by 45 per cent (Figure 1). Slovenia's farms, however, are worse off since protection is lower after accession. Estonia's agriculture, being the least protected in the reference projection, profits the most from high income support by the CAP. Negative impacts of the CAP on consumers in CEC-I resulting from price increases for sugar, milk and beef are balanced by falls in prices for pork, poultry and eggs. The total impact on consumer welfare (measured by the equivalent variation) is small compared to producer welfare (Figure 1). This is also due to the low value share of agricultural products in food retail prices and the reorientation of the CAP from price support towards direct subsidies. The gains in producer incomes mainly result from transfers financed by the EU. The model estimates these additional budgetary costs at EURO4.3 billion at 1999 prices.

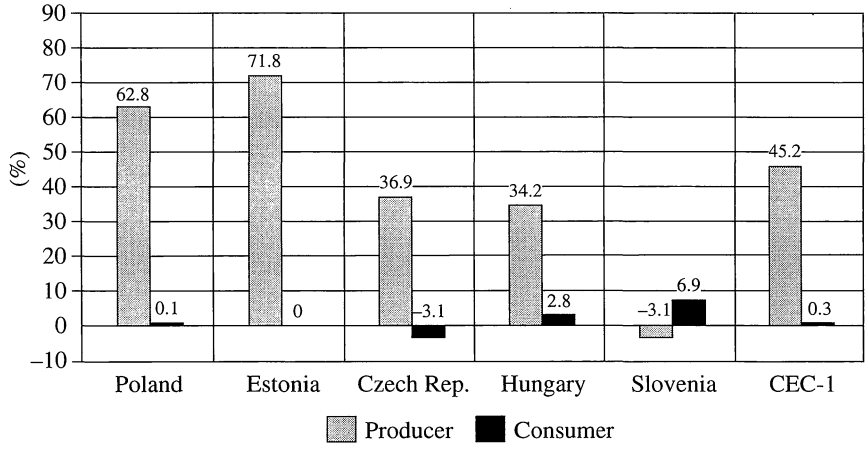

FIGURE 1 *Welfare changes in CEC-I: EU accession under Agenda 2000 conditions versus base run (%)*

CONCLUSIONS

Implementing the EU market regulations in the potential first wave accession countries (CEC-I) changes their levels and patterns of agricultural protection. In most of CEC-I higher protection would raise farm incomes. A low value share of agricultural products in retail prices, plus the further reorientation of the CAP from market price towards direct income support, reduce harmful effects on consumer welfare. The main source of gains in producer welfare is the direct subsidies financed by the EU budget. Total welfare in CEC-I increases provided that by far the greater share of the budgetary burden is paid by the old member states. Justifiable reasons to fear EU accession in countries like Poland, Estonia, the Czech Republic and Hungary can thus only be found (if at all) in areas beyond the scope of this partial analysis.

The estimated impact of accession on product balances is small. Price support will increase surpluses of sugar, milk and beef in the enlarged EU, but this effect is limited by the quota systems. For pork, poultry and eggs, a greater import potential in CEC-I could result in opening up additional export opportunities for farmers in the old member states.

REFERENCES

Diewert, W.E. and Wales, T.J. (1987), 'Flexible functional forms and global curvature conditions', *Econometrica*, 55, 43–68.

Diewert, W.E. and Wales, T.J. (1988), 'Normalised Quadratic Systems of Consumer Demand Functions', *Journal of Business and Economic Statistics*, **6**, 302–12.

European Commission (1998), *Agricultural Situation and Prospects in the Central and Eastern European Countries*, Working Documents, Brussels: European Commission.

FAPRI (1999), *World Agricultural Outlook* (http:\\www.fapri.iastate.edu).

Frohberg, K., Hartmann, M., Weingarten, P., Fock, A., Wahl, O. (1997), 'The Central European Agricultural Simulation Model (CEASIM) – An Overview', unpublished research report, Halle/Saale, IAMO.