

Economic impacts of the Common Agricultural Policy on cash crops in the Czech Republic

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Abstract

The Common Agricultural Policy (CAP) was implemented in the Czech Republic after joining the European Union (EU) in May 2004. The economic impact of CAP on profit for legal entities is modelled using hypothetical cash crop farms in three production areas. The Czech agricultural policy scheme before entering EU and CAP scheme are compared in the years from 2004 to 2006. In 2004 the profits for winter wheat, summer barley and rape increased in all production areas. The profit for sugar beet strongly increased. In the case of winter wheat, summer barley and rape this is caused by the increase of direct payments, for sugar beet beside the direct payments the price rose by almost 50%. Under the CAP regime the profits per ha winter wheat, summer barley and rape increased by approx. CZK 1,000 in 2005. In 2006, the profits per ha stabilised roughly at the 2005 level. The profit per ha of sugar beet declined in 2005 by approximate CZK 1,800 and in 2006 by CZK 380 compared to the previous year, but remained on a high level. The average additional operating result per ha cash crops of the modelled farms was in the year 2004 in production area I CZK 4,461 (10.6% sugar beet of cash crop area), in prod. area II CZK 2,011 (0.3% sugar beet of cash crop area) and in prod. area III CZK 1,927 per ha (no sugar beet).

Keywords: Agricultural policy, microeconomic, cash crops

1. Introduction

The Czech Republic joined the European Union (EU) in May 2004. Subsequently the CAP of the EU was implemented. Before entering the EU Czech farmers were eligible to receive direct payments on arable land if they participate in a set aside regulation scheme. This system was replaced by the Single Area Payment Scheme (SAPS) according to the simplified introduction of the EU scheme and the possibility to top-up these payments with national funds. The new agricultural policy scheme had major impacts on direct support for agricultural crops. To quantify the economic impact on the profit for legal entities, hypothetical cash crop farms in three production areas are modelled. The Czech agricultural policy scheme before EU-accession and the CAP scheme are compared in the years from 2004 to 2006. The profit of a cash crop is computed by revenues plus direct payments minus costs. These factors, based on farm accountancy data (FAD) and agricultural policy, will be investigated from 1999 to 2004. To get significant results in the comparison of old and new agricultural policy scheme in 2004, yield fluctuations are eliminated; changes in the level of direct payments and in market prices are included in the profit calculations. To estimate the impact of phasing in of the direct payments, profits for the years 2005 and 2006 are computed using average yields, prices from 2004, phasing in of direct payments and an estimation of costs in 2005 and in 2006.

2. Direct payments on arable land

In the Czech Republic direct payments for agricultural crops linked to a set aside regulation on arable land, exists since 2001 (Government Decree Nr. 86/2001 Coll. as amended). For this study direct support for rape on set aside area and related complementary payments for other crops on agricultural areas were relevant. Support under SAPS is implemented according the phasing-in of direct payments of EU in the new Member States (25% in 2004, 30% in 2005 and 35% in 2005 of the total amount of direct aid given under market regulations scheme of EU, the so called 1. pillar of CAP). These payments were topped-up by 28% (related to 1. pillar of CAP) in 2004 and in 2005. In 2006 the percentage is estimated at 28% (the maximum top-up level is fixed at 30%). The top-up payments were given in 2004 before EU accession for

all agricultural crops. In 2005 and 2006 top-up has to be given according to EU rules. Thus, sugar beet were eligible for the top-up payment only in 2004 (OJ L 236 of 23rd September 2003, pp. 365-371). The direct payment scheme before entering EU and SAPS are not fully comparable. Formerly set-aside of arable land was voluntary and a precondition to get the direct support, whereas under the new rules set aside on arable land is not obligatory. Therefore in the calculations 6% of arable land was assigned to rape on set aside. Arable land is not eligible for Less Favoured Areas (LFA) payments during the observation period, thus these are not taken into consideration. Agri-environmental measures on arable land (organic farming, growing of catch crops, conversion of arable land in grassland and bio belts, crop rotation in cave protection zones) are not included in this study because the compensation payments cover at most the additional expenditures or the foregone income. Financial incentives to participate in the agri-environmental program are not provided (MZE 2004b). The direct payments included in this study are listed in Table 1.

Table 1: Direct payments on arable land in CZK² per ha from 2004 to 2006

Payment scheme	2004 ¹⁾	2004 ²⁾	2005	2006 ³⁾
Rape on set aside ⁴⁾	5,500			
Other arable land ⁵⁾	1,000			
SAPS		1,830	2,196	2,563
Top-up		1,479	2,400	2,400

¹⁾ policy scheme before entering EU, maximum levels; ²⁾ CAP; ³⁾ estimated; ⁴⁾ maximum for 6% of arable land possible; ⁵⁾ only in combination with set aside on arable land eligible
Compiled from several sources: MZE 2004a, p. 147 and 2005, p. 189; SZIF 2005a and 2005b; NV 86/2001 Sb. as amended and own estimation

3. Agricultural structure and land use

The farm size in Czech Republic is favourable compared to other European countries. From 54,071 registered farms in the farm structure survey of 2003, 26,016 farms cultivate at least 3 ha of arable land. 3,921 farms with an agricultural area of at least 100 hectares manage 75.4% of

² The exchange rate EUR:CZK in 2004 was 1:31.904; in 2005 1:29.784 (annual averages) and in February 2006 1:28.409 (CNB 2006, p. 1).

the total utilised agricultural area (UAA) and 1,117 farms with more than 1,000 ha cultivate 60.7% of the Czech UAA (ČSÚ 2004a). A weak point of the Czech agriculture is the 89.3% share of rented land on total agricultural area. Farms above 500 ha even rent about 95% of UAA (MZE 2004a).

The FAD provides data on the average land use of legal entities in three production areas (see Table 2). The share of arable land is relatively high, as is the share of cash crops on arable land. The acreage of winter wheat (includes other winter cereals) summer barley (includes other summer cereals) rape and sugar beet on arable land represents in 2004 in production area I 97.8% of cash crops, in production area II 96.0% and in production area III 95.2%. Neglecting cash crops with a low acreage is not expected to affect the significance of the results of this study because the payments per ha are the same for oil plants, protein plants and cereals. Other crops such as poppy or flax only play a subordinate role in land use.

Table 2: Average Czech land use in three production areas in 2004

Land use	Production area								
	I			II			III		
	ha	% ¹⁾	% ²⁾	ha	% ¹⁾	% ²⁾	ha	% ¹⁾	% ²⁾
Agricultur. land	1,698			1,503			1,451		
Arable land	1,597	94.1		1,210	80.5		946	65.2	
Grassland	74	4.4		290	19.3		501	34.5	
Cash crops total	1,353	84.7		920	76.1		702	74.2	
Winter wheat	652		48.2	520		56.5	380		54.2
Summer barley	410		30.3	200		21.7	166		23.7
Rape	116		8.6	161		17.5	122		17.3
Sugar beet	144		10.6	3		0.3	0		0.0

¹⁾ share on agricultural land, in the case of cash crops total share on arable land

²⁾ share on cash crops

Source: FADN CZ and own calculation

4. Data for costs, yield and price

The main data for costs, yields and prices are taken from a sample survey by the Research Institute of Agricultural Economics (RIAE) of legal entities from the Czech FAD (see Table 3).

Table 3: Costs, yields, and prices of selected cash crops in three production areas from 1999 to 2004

Crop		Area	1999	2000	2001	2002	2003	2004
Winter wheat	Costs	I	14,249	13,808	14,890	16,034	15,486	15,881
		II	13,375	12,818	13,360	15,509	13,990	14,957
		III	12,201	11,520	11,851	13,186	12,899	12,871
	Yield	I	5.59	4.99	5.38	5.26	4.49	6.17
		II	4.89	4.63	4.95	4.89	4.13	6.09
		III	4.82	4.33	4.51	4.39	4.19	5.47
	Price	I	3,062	3,308	3,357	2,997	3,302	3,151
		II	2,987	3,212	3,467	2,999	3,375	3,137
		III	2,978	3,289	3,446	2,895	3,085	3,094
Summer barley	Costs	I	11,055	11,439	12,186	13,564	11,929	13,069
		II	10,384	10,360	12,104	13,178	10,728	12,593
		III	10,555	10,438	11,713	11,629	11,106	12,013
	Yield	I	4.63	3.54	4.36	4.41	4.48	5.47
		II	3.80	3.36	3.85	3.68	3.91	5.07
		III	3.99	3.54	3.71	3.42	3.80	4.70
	Price	I	3,062	3,308	3,357	2,997	3,302	3,151
		II	2,987	3,212	3,467	2,999	3,375	3,137
		III	2,978	3,289	3,446	2,895	3,085	3,094
Rape	Costs	I	16,496	17,268	18,728	20,021	17,608	21,637
		II	15,617	16,192	16,917	19,551	17,336	19,909
		III	14,272	13,574	15,026	17,080	16,373	17,724
	Yield	I	2.83	2.66	2.80	2.39	1.54	3.77
		II	2.88	2.95	3.01	2.45	1.65	3.63
		III	2.81	2.75	2.77	2.25	1.58	3.33
	Price	I	5,471	6,228	6,428	5,868	7,004	6,646
		II	5,450	6,046	6,537	5,923	7,308	6,160
		III	5,513	6,316	6,534	5,917	7,046	6,263
Sugar beet	Costs	I	37,501	36,286	39,316	40,922	37,268	43,530
		II	37,359	40,123	40,716	44,574	37,235	42,754
	Yield	I	45.28	47.61	48.71	48.23	43.51	45.91
		II	52.35	53.36	50.02	59.93	45.26	46.32
	Price	I	799	1,038	942	901	931	1,419
		II	790	1,038	793	870	867	1,253

Costs: CZK per ha; yield: tons per ha; price: CZK per ton

Compiled from several sources: NOVÁK et al. 2000 and 2001; POLAČKOVÁ et al. 2002, 2003, 2004, and 2005

Next to averages for the main commodities, a division into main production areas is also published (NOVÁK et al. 2000 and 2001;

POLAČKOVÁ et al. 2002, 2003, 2004 and 2005). The production areas are delimited according to the natural precondition for farming like altitude, mean annual temperature, mean sum of depreciations, soil texture and others. Production area I represents favourable, production area II average and production area III less favourable preconditions for plant production.

5. Profit estimates for the selected cash crops

5.1. Yields and prices

Yields are subject to annual fluctuations. In 2004 they were significantly higher than in the observation period from 1999 to 2004. Thus for this study average yields from 1999 to 2003 are used for the years 2004, 2005 and 2006 to eliminate the impact of this variation. In the case of rape average yields from 1999 to 2004 are used to get a significant average.

The prices also differ each year. A correlation between the price and the yield was not measurable in the data base from 1999 to 2004. The implementation of the CAP did not lead to higher product prices for the observed commodities winter wheat, summer barley and rape. The prices of 2004 were used for the years 2005 and 2006 given the lack of reliable forecasts. In the EU the price for sugar beet is relatively high and fixed until 2006. This has led to an increase by almost 50% compared to prices before joining the EU. Therefore in the comparison the price in 2003 is used in 2004 (old scheme). In 2004 (new scheme), 2005 and 2006 the sugar beet price according to the CAP is used.

5.2. Direct payments

The direct payments according to the old policy scheme considered in this study are for rape on set aside CZK 5,500 per ha and for other arable land CZK 1,000 per ha. Under SAPS the value is rising from CZK 1,830 per ha in 2004 to CZK 2,563 in 2006. Top-up payments rises from CZK 1,479 per ha in 2004 to CZK 2,400 in the years 2005 and 2006. A comparison to the old scheme shows that for all cereals and rape the direct payments rose per ha by CZK 2,309 in 2004, by CZK 3,596 in 2005 and by CZK 4,963 in 2006. The direct payments per ha given to sugar beet rose related to the old scheme in 2004 like all other

investigated cash crops (CZK 2,309). In 2005 and in 2006 the direct payments per ha rose just by SAPS. The amount compared to the old scheme is CZK 1,196 and CZK 1,563 respectively. The production of rape on set aside area was under the old scheme supported by CZK 5,500 per ha for maximum 6% of arable land. With the implementation of CAP this amount was reduced by CZK 2,191 per ha in 2004, by CZK 904 in 2005 and by CZK 537 in 2006.

5.3. Costs

The costs cover seeds, fertilisers, plant protection, renting of land, labour, machinery and overheads. On average they increased annually by 1.70% in the period from 1999 to 2004. To estimate further developments, the costs of 2004 are extrapolated for the years 2005 and 2006 using this average increase.

6. Impact of CAP on profit of selected cash crops

There are significant changes for each investigated crop (see Table 4).

Table 4: Estimated economic impact of CAP on profit in CZK of selected cash crops in 2004

Prod. area	Crop	2004 ¹⁾	2004 ²⁾	Difference ³⁾
I	Winter wheat	1,324	3,633	2,309
	Summer barley	3,964	6,274	2,309
	Rape (on set aside) ⁴⁾	1,580	---	---
	Rape	-2,920	-611	2,309
	Sugar beet	917	26,013	25,095
II	Winter wheat	780	3,090	2,309
	Summer barley	851	3,160	2,309
	Rape (on set aside)	2,601	---	---
	Rape	-1,899	410	2,309
	Sugar beet	3,515	25,963	22,448
III	Winter wheat	1,895	4,204	2,309
	Summer barley	1,051	3,360	2,309
	Rape (on set aside)	3,945	---	---
	Rape	-555	1,754	2,309

¹⁾ policy scheme before entering EU; ²⁾ CAP; ³⁾ between the schemes; ⁴⁾ under SAPS no set aside requirement

Source: own calculation

The extremely positive profit development for sugar beet (plus CZK 25,086 in production area I and CZK 22,439 in production area II) is due to the increase in product price and the direct payments under the SAPS. Additionally sugar beet was eligible for top-up in 2004. The profits of winter wheat, barley and rape rose by CZK 2,309 per ha. This is caused by the increase of direct payments by implementation of CAP. Rape on set aside was the only crop which got a high level of direct support under the old support scheme. With the implementation of the SAPS, set-aside areas were not required anymore.

The phasing in of direct payments (annual increase of SAPS by 5%) covers the estimated rise in costs for all investigated cash crops in 2005 and in 2006 except sugar beet. The changes of the conditions to receive top-up payments in 2005 increased the payments per ha under this title for winter wheat, summer barley and rape by CZK 921, sugar beet was not eligible anymore. Under the CAP regime the profits per ha winter wheat, summer barley and rape increased by approximately CZK 1,000 in 2005. In 2006 the profit per ha stabilised roughly at the 2005 level. The profit per ha of sugar beet declined in 2005 by approximate CZK 1,800 and in 2006 by CZK 380 compared to the previous year, but remained on a high level compared to the other cash crops (Table 5).

Table 5: Estimated economic impact of CAP on profit development in CZK of selected cash crops in 2005 and in 2006

Prod. area	Crop	2004	2005	Diff.¹⁾	2006	Diff.¹⁾
I	Winter wheat	3,633	4,650	1,017	4,742	92
	Summer barley	6,274	7,339	1,065	7,479	140
	Rape	-611	309	919	301	-8
	Sugar beet	26,013	24,160	-1,853	23,773	-387
II	Winter wheat	3,090	4,123	1,033	4,230	107
	Summer barley	3,160	4,233	1,073	4,381	148
	Rape	410	1,359	949	1,380	22
	Sugar beet	25,963	24,123	-1,840	23,750	-373
III	Winter wheat	4,204	5,273	1,068	5,416	144
	Summer barley	3,360	4,443	1,083	4,601	158
	Rape	1,754	2,740	986	2,800	60

¹⁾ compared to the previous year

Source: own calculation

7. Economic impact of the CAP on hypothetical cash crops farms

To show the impact of the CAP on the farm level, hypothetical farms are modelled for three production areas based on FAD (acreage see in Table 2). The main impact of the CAP on farm profit results from higher direct payments and in the case of sugar beet the rise in product price. These differences between the cash crops can be seen in the average additional operating results per ha. In production area I, these are CZK 4,461, in production area II CZK 2,011 and in production area III CZK 1,927 (see Table 6).

Table 6: Economic impact in CZK of CAP on profit of hypothetical cash crop farms in three production areas compared to the old policy scheme in 2004

Prod. area	ha	2004 ¹⁾	2004 ²⁾	Difference ³⁾	
				at farm	per ha
I	1,323	2,712,797	8,612,408	5,899,611	4,461
II	883	607,338	2,384,066	1,776,728	2,011
III	669	1,083,836	2,372,324	1,288,488	1,927

¹⁾ policy scheme before entering EU; ²⁾ CAP; ³⁾ between the schemes

Source: own calculation

Table 7 shows the further development of profit of cash crops within the CAP in 2005 and in 2006. The annual increase of direct payments covers at least the estimated rise in costs in the observation period but reduce towards zero in all production areas in 2006.

Table 7: Economic impact in CZK 1,000 of phasing in of CAP on profit development of hypothetical cash crop farms in three production areas in 2005 and in 2006

Prod. area	2004	2005	Difference ¹⁾		2006	Difference ¹⁾	
			at farm	per ha		at farm	per ha
I	8,612.4	9,553.1	940.7	0.711	9,613.8	60.7	0.046
II	2,384.1	3,281.9	897.8	1.016	3,369.7	87.8	0.099
III	2,372.3	3,078.9	706.6	1.057	3,167.1	88.2	0.132

¹⁾ difference to the previous year

Source: own calculation

8. Conclusions

The implementation of the CAP significantly affected the profits of cash crops in the Czech Republic. Before EU accession Czech agricultural policy on arable land supported set aside, including rape on set aside area. Additional payments were given to other agricultural areas used by farms within the set aside scheme. With the implementation of CAP (under SAPS and top-up) set-aside areas were not required anymore. The profits for winter wheat, summer barley and rape increased and profits for sugar beet strongly increased compared to the Czech agricultural policy scheme across the observation period from 2004 to 2006 and the three production regions. In the case of winter wheat, summer barley and rape this is caused by the increase of direct payments, for sugar beet beside the direct payments the prices rose by almost 50%.

These differences between the cash crops can be seen in the average additional operating results per ha of modelled farms due to the different share of each cash crop. In 2004 the differences in production area I are CZK 4,413 (9% sugar beet of cash crop area), in production area II: CZK 2,023 (0.3% sugar beet of cash crop area) and in production area III: CZK 1,946 per ha (no sugar beet). Fundamental changes in the acreage of cash crops are not likely due to limiting of sugar quota.

Acknowledgments

This study is part of the research project: Micro- and macroeconomic impacts of the Common Agricultural Policy of European Union on the Czech agricultural sector, supported by a MOEL-Grant of the Austrian Research Community (Österreichische Forschungsgemeinschaft).

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