Competitiveness in the production of selected crops from the perspective of variable costs

Konkurencieschopnosť pestovania vybraných rastlinných komodít z hľadiska variabilných nákladov

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Abstract: This article deals with the issue of Slovakia's competitiveness vis-à-vis the Czech Republic, Poland, Hungary, Germany, Austria and France in terms of basic variable costs invested into seeds (planting stocks), fertilisers and chemical protective in the period from 2001 to 2003. In addition to these costs, the article also compares total revenues, profit, effect of inputs into production and the variable costs profit margin. This comparative analysis uses data published for 2002. While the data for years 2001 and 2003 for Slovakia and the Czech Republic are actual, those for other countries have been simulated. The basic variable costs per tonne of the produced crop (average figure for 2001 and 2003) in Slovakia are lower, i.e. it is competitive in the production of cereals, sunflower and sugar beet vis-à-vis the observed EU-15 countries, barley, sunflower and sugar beet vis-à-vis the Czech Republic, wheat and barley vis-à-vis Poland and barley vis-à-vis Hungary.

Key words: competitiveness, total revenue, basic variable costs, profit margin, gross margin

Abstrakt: Príspevok sa zaoberá konkurencieschopnosťou Slovenska voči Česku, Poľsku, Maďarsku, Nemecku, Rakúsku a Francúzsku z hľadiska základných variabilných nákladov na osivá (sadivá), hnojivá a chemické ochranné prostriedky pri pestovaní rastlinných komodít v období rokov 2001 a 2003. Okrem uvedených nákladov sa v príspevku komparujú aj celkové príjmy, zisk, efekt vložených vstupov do výroby a rentabilita variabilných nákladov. Základom pre komparatívnu analýzu boli publikované údaje za rok 2002. Údaje za roky 2001 a 2003 za Slovensko a Česko sú skutočné, údaje za ostatné krajiny sú nasimulované. Z hľadiska základných variabilných nákladov na tonu vyrobenej komodity v priemere za roky 2001 a 2003 má Slovensko nižšie náklady, t.j. je konkurencieschopné voči sledovaným krajinám EÚ-15 pri obilninách, slnečnici a cukrovej repe, voči ČR pri jačmeni, slnečnici a cukrovej repe, voči PR pri pšenici a jačmeni a voči MR pri jačmeni.

Kľúčové slová: konkurencieschopnosť, celkové príjmy, základné variabilné náklady, rentabilita, hrubý zisk

INTRODUCTION

'Competitiveness' is a widely used term with a number of definitions. This term has a number of aspects: e.g. potential competitiveness, real competitiveness, or the process leading to competitiveness (Matošková 2002). This last aspect is related to organisation and administration framework, which enables potential competitiveness to become a real one.

Most of the potential competitiveness measures focus on monitoring and analysing various items such as price, production intensity, accessibility of certain production factors and production costs. In my article, I focus on the analysis of variable costs, which I compare in Slovakia, the Czech Republic, Poland, Hungary, Germany, Austria and France. This represents one of the steps in the analysis of potential competitiveness.

MATERIAL AND METHODS

No comparable data on the total production costs of individual agricultural crops in the observed countries are available. The only data available are those on the variable costs of the selected crops. According to Brooks (Brooks 2003), countries use different specific items of variable costs, what has its grounds in differing accounting methods and farming practices. E.g. works on fields (ploughing, sowing, spraying and cropping) performed by the farmer himself using his own workforce may be considered fixed costs. If the farmer contracts most of the work on the fields, the costs of such work may be classified as variable costs. Some fixed costs items in one country may be, therefore, considered variable costs in another. This is very common and there are differences even within the same country.

This comparative analysis uses the data published for the year 2002 (Brooks 2003). Figures for Slovakia and the Czech Republic for years 2001 and 2003 were obtained from the Research Institute of Agricultural and Food Economics, the Research Institute of Agricultural Economics and the Ministry of Agriculture of the Czech Republic. Statistics for other countries have been simulated, assuming that the quantity of seeds, fertilisers and chemical protective used in the years 2001–2003 was stabilised and adequate in terms of areas of the respective crops. The year 2002 is the basic year, the prices of fertilisers and chemical protective were adjusted using the price indices of industrial producers published for the respective years in the CANSTAT and Agricultural Statistics (EUROSTAT) bulletins. The data on the prices of crops in Poland were obtained from the Ministry of Agriculture in Warsaw and those for Hungary from the Research and Information Institute for Agricultural Economics (AKII) in Budapest. The data on per hectare yields and crop areas were obtained from the FAO database.

The following data were used for simulation for the individual crops:
– price
– per hectare yield
– costs of seeds, fertilisers and chemical protective
– subsidies (area payments)

The following indicators were calculated on the basis of the above data:
– revenue from sales = price x hectare yield
– total revenue = revenue from sales + subsidies
– basic variable costs = costs of seeds + fertilisers + chemical protective
– profit = price (per tonne) – basic variable costs (per tonne)
– gross margin = total revenue – basic variable costs

Table 1. Slovakia's competitiveness in the production of wheat vis-à-vis selected countries from the perspective of variable costs and gross margin

Wheat	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	99	106	138	94	115	108	120
		2002	99	83	118	95	93	95	95
		2003	99	98	109	126	118	107	119
Yield	t/ha	2001	4.5	4.8	3.5	4.3	7.9	5.2	6.6
		2002	4.0	4.7	3.7	3.5	6.9	5.0	7.6
		2003	3.4	4.1	3.4	2.6	6.5	4.4	6.2
Total revenue	EUR/t	2001	105	106	138	94	159	173	172
per tonne		2002	104	83	118	95	143	161	140
of product		2003	110	98	109	126	172	182	175
Basic variable	EUR/t	2001	36	38	45	33	43	57	43
costs per tonne		2002	43	43	43	40	49	59	37
of product		2003	50	48	48	56	53	68	46
Profit per tonne	EUR/t	2001	62	69	93	61	72	51	77
of product		2002	56	40	75	55	44	36	58
		2003	49	50	61	70	65	39	73
Gross	EUR/t	2001	69	68	93	61	116	116	129
margin per tonne		2002	61	40	75	55	94	102	102
of product		2003	60	50	61	70	119	114	128
Profit margin	coef.	2001	1.90	.	.	.	2.71	2.04	3.00
with subsidies		2002	1.40	.	.	.	1.90	1.71	2.73
		2003	1.19	.	.	.	2.26	1.67	2.77
Profit margin	coef.	2001	1.71	1.83	2.07	1.82	1.68	0.90	1.79
without subsidies		2002	1.28	0.95	1.75	1.36	0.88	0.60	1.53
		2003	0.98	1.04	1.27	1.27	1.24	0.57	1.57
Revenue/costs	coef.	2001	2.7	2.8	3.1	2.8	2.7	1.9	2.8
		2002	2.3	1.9	2.8	2.4	1.9	1.6	2.5
		2003	2.0	2.0	2.3	2.3	2.2	1.6	2.6

Source: FAO and EUROSTAT databases, Research Institute of Agricultural and Foodstuffs Economics (VÚEPP) – Bratislava, Research Institute of Agricultural Economics (VÚZE) and the Ministry of Agriculture – Praha, Research and Information Institute for Agricultural Economics (AKII) – Budapest, Ministry of Agriculture of Poland – Warsaw, Brooks (2003), author's own calculations (revenue per tonne, costs per tonne, revenue/costs, profit margin per tonne, profit margin)

Total revenue and basic variable costs were recalculated per hectare and tonne of the produced crop (Tibenská 2001). The following indicators were then calculated:

– quantity of produced crops (in Euros) per 1 Euro of inputs = revenue from sales / basic variable costs
– profit margin with subsidies = gross margin / basic variable costs and
– profit margin without subsidies = profit / basic variable costs.

RESULTS AND DISCUSSION

In terms of variable costs, 1 tonne of wheat in years 2001–2003 was produced most cheaply in France, the Czech Republic and Hungary. The costs were only by 2% higher in Slovakia. The EU-15 countries enjoy the highest total revenue per 1 tonne of wheat because of higher production prices.

This is due to a higher level of subsidisation in the EU-15 countries than in the countries of the V-4.

The highest profit margin on variable costs, taking into account the provided subsidies, was achieved in France. While Austria had the lowest profit margin calculated excluding subsidies in 2001–2003 (0.69), Poland had the highest (1.70). As regards the effect of inputs into production, 1.7 to 2.7 Euros were gained from 1 Euro of basic variable costs; notably, this indicator was higher in the V-4 countries than in the EU (Table 1).

As the Table 2 indicates, in the observed period of years 2001–2003, rye was produced most cheaply in Poland and Hungary. The costs per tonne of rye in Poland represented, on average 43%, and in Hungary 76% of those in Slovakia. On the basis of this measure, the sum invested in seeds, seed stocks, fertilisers and protective in the EU-15 is by 20% higher than that in Slovakia.

Slovakia had by 17% higher revenue per tonne of rye than other V-4 countries because of the higher price, per hectare yield and subsidies. The EU-15 countries, however, had, on average, by 50% higher revenue owing to high subsidies and per hectare yields. Hungary and Poland had in the production of rye the highest profit margin on variable costs without subsidies. Excluding

Table 2. Slovakia's competitiveness in the production of rye vis-à-vis selected countries from the perspective of variable costs and gross margin

Rye	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	92	.	100	86	102	86	96
		2002	96	.	89	85	93	78	88
		2003	97	.	85	108	89	75	84
Yield	t/ha	2001	3.2	.	2.4	2.4	6.1	4.2	4.1
		2002	2.7	.	2.5	1.9	5.0	3.6	4.9
		2003	2.7	.	2.1	1.4	4.3	3.3	4.0
Total revenue per tonne of product	EUR/t	2001	108	.	100	86	157	164	179
		2002	107	.	89	85	160	169	158
		2003	119	.	85	108	167	176	171
Basic variable costs per tonne of product	EUR/t	2001	39	.	19	27	46	49	58
		2002	49	.	18	33	56	57	50
		2003	51	.	22	46	66	64	60
Profit per tonne of product	EUR/t	2001	53	.	81	59	56	37	38
		2002	47	.	71	52	37	21	38
		2003	46	.	63	62	23	11	24
Gross margin per tonne of product	EUR/t	2001	69	.	81	59	112	115	121
		2002	58	.	71	52	104	112	109
		2003	68	.	63	62	101	112	110
Profit margin with subsidies	coef.	2001	1.80	.	.	.	2.43	2.35	2.07
		2002	1.17	.	.	.	1.85	1.96	2.20
		2003	1.34	.	.	.	1.53	1.76	1.82
Profit margin without subsidies	coef.	2001	1.38	.	4.27	2.22	1.22	0.75	0.65
		2002	0.95	.	3.84	1.56	0.66	0.36	0.77
		2003	0.89	.	2.78	1.35	0.35	0.17	0.39
Revenue/costs	coef.	2001	2.4	.	5.3	3.2	2.2	1.7	1.7
		2002	1.9	.	4.8	2.6	1.7	1.4	1.8
		2003	1.9	.	3.8	2.4	1.4	1.2	1.4

Source: see Table 1

subsidies, the EU-15 countries would have the lowest profit margin. The inputs were most effectively used in the production of rye in Poland, where, in average, 4.6 Euros were earned per 1 Euro of invested variable costs. In Slovakia it was 2.1 Euros, more than in the countries of the EU-15.

In average, in years 2001–2003 in Slovakia, it was necessary to invest less into seeds, fertilisers and chemical protective for the production of 1 tonne of barley than in the observed countries, which represents a comparative advantage in terms of costs. Revenues from one tonne of produced barley are, however, affected by the price and per hectare yields. Due to better per hectare yields, this indicator was much higher in the EU-15 countries than in the countries of the V-4, which was caused also due to the significant area payments provided within the frame of the CAP. Slovakia achieved a very good result in the field of effect of inputs into the production of barley, making 2.9 Euros on 1 Euro of basic variable costs. The top scorer in this field was Germany (3.1 Euros). Slovakia's average profit margin in the field of variable costs without subsidies during the observed years was 1.89, a good result in comparison to other countries (Table 3).

In the years 2001–2003, the production of one tonne of maize cost more in Slovakia than in the Czech Republic or Hungary. Basic inputs in the countries of the EU-15 were approximately by 20% more expensive. The revenue from the sale of a tonne of maize in the V-4 countries was lower because of low prices and per hectare yields. Due to higher prices, per hectare yields and subsidies, the revenue that EU-15 countries made from 1 tonne of maize was 60% higher than that in Slovakia. The average profit margin in the field of variable costs with subsidies in Slovakia in the years 2001–2003 was 1.63. The EU-15 countries are able to make a high, 2.00 plus profit margin because of the area payments. If no subsidies were provided, these countries would still produce maize with profit, but the difference would not be so significant in comparison to the V-4 countries. Variable inputs costs were invested more effectively in Slovakia than in the EU-15 countries – 2.5 Euros were made on 1 Euro of basic variable costs invested into maize production. The best scorer in this category is the Czech Republic (3.0) (Table 4).

Table 3. Slovakia's competitiveness in the production of barley vis-à-vis selected countries from the perspective of variable costs and gross margin

Barley	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	108	95	108	79	135	96	106
		2002	86	86	112	81	123	87	108
		2003	112	87	109	79	125	89	120
Yield	t/ha	2001	3.6	4.1	3.1	3.5	6.4	4.7	5.8
		2002	3.7	3.9	3.2	2.8	4.4	4.0	6.1
		2003	3.4	3.9	2.8	2.4	5.1	4.2	5.6
Total revenue per tonne of product	EUR/t	2001	116	96	108	79	189	166	164
		2002	91	86	112	81	202	171	164
		2003	120	87	109	79	193	167	181
Basic variable costs per tonne of product	EUR/t	2001	33	33	43	29	34	45	41
		2002	34	39	42	36	49	54	40
		2003	40	38	49	43	43	52	43
Profit per tonne of product	EUR/t	2001	75	62	65	50	101	51	65
		2002	52	47	70	45	74	33	68
		2003	72	49	60	36	82	37	77
Gross margin per tonne of product	EUR/t	2001	83	63	65	50	155	121	123
		2002	57	47	70	45	152	117	124
		2003	81	49	60	36	151	116	138
Profit margin with subsidies	coef.	2001	2.55	.	.	.	4.60	2.67	2.97
		2002	1.70	.	.	.	3.08	2.15	3.15
		2003	2.03	.	.	.	3.50	2.23	3.19
Profit margin without subsidies	coef.	2001	2.29	1.86	1.52	1.69	3.00	1.12	1.57
		2002	1.55	1.23	1.66	1.27	1.49	0.60	1.73
		2003	1.83	1.31	1.22	0.83	1.91	0.72	1.78
Revenue/costs	coef.	2001	3.3	2.9	2.5	2.7	4.0	2.1	2.6
		2002	2.5	2.2	2.7	2.3	2.5	1.6	2.7
		2003	2.8	2.3	2.2	1.8	2.9	1.7	2.8

Source: see Table 1

Revenues from 1 tonne of rape are substantially lower in the V-4 countries than in the EU-15 (Table 5). The reasons are lower prices, per hectare yields and the amount of subsidies. In terms of variable costs, most of the observed countries were able to produce rape in the years 2001–2003 much more cheaply than Slovakia where the production became very expensive, especially in 2003.

The quantity of production (in Euros) per 1 Euro of inputs oscillated between 1.4-2.6 Euros in the V-4 countries in the years 2001–2003, while in the EU-15 countries it was 2.0-2.8. Slovakia's result (1.4 Euro made on 1 Euro of variable costs of rape) represents the worst result among all observed countries. Slovakia reached the worst result also in the field of profit margin on variable costs, achieving with and without subsidies only 0.54 or 0.35 respectively.

Total revenues from1 tonne of produced sunflower in 2003 were slightly higher in Slovakia than in Hungary and the Czech Republic. Higher per hectare yields and subsidies helped the EU-15 countries make very high revenue. With regard to costs of seeds, fertilisers and chemical protective, all the observed countries except for Hungary invested more into production of a tonne of sunflower than Slovakia. The basic variable costs invested in Hungary in 2001–2003 were by 17% lower than in Slovakia. Slovakia's profit margin in the field of variable costs with subsidies was 1.65, exceeding that of Austria. Hungary is currently producing sunflower seed without subsidies with the highest profit margin. Excluding subsidies, Austria's profit margin would be only 0.61. The inputs into production of sunflower were invested most effectively in Hungary (3.4 Euro). Other countries were able to make 1.6–2.7 Euros on 1 Euro of costs of variable inputs (Table 6).

The prices and per hectare yields of sugar beet were lower in the V-4 countries than in the EU-15 countries. This had adequate impact on the amount of revenues. While the revenue from a tonne of sugar beet was roughly the same in all V-4 countries, in the EU-15 countries it was by 20–40% higher. In this connection, it is necessary to point out that the sugar beet production was subsidised only in Slovakia (Table 7).

Table 4. Slovakia's competitiveness in the production of maize vis-à-vis selected countries from the perspective of variable costs and gross margin

Maize	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	100	116		74	110	110	119
		2002	87	93	.	95	105	103	97
		2003	100	103		121	120	115	125
Yield	t/ha	2001	5.7	6.2	.	6.2	8.8	9.1	8.6
		2002	5.4	7.3	.	5.1	9.1	9.0	9.0
		2003	4.1	6.0	.	3.9	7.2	8.4	7.1
Total revenue	EUR/t	2001	106	116	.	74	164	146	175
per tonne of product		2002	92	93	.	95	157	140	151
		2003	109	102	.	121	186	154	194
Basic variable	EUR/t	2001	34	32	.	31	46	46	44
costs per tonne		2002	38	32	.	37	45	47	43
of product		2003	46	39	.	50	57	51	55
Profit per tonne	EUR/t	2001	66	84	.	43	64	64	75
of product		2002	49	61	.	58	60	56	54
		2003	53	64	.	71	63	64	70
Gross margin	EUR/t	2001	72	84	.	43	119	100	131
per tonne		2002	54	61	.	58	112	93	109
of product		2003	63	63	.	71	129	103	140
Profit margin	coef.	2001	2.11	.	.	.	2.59	2.17	2.96
with subsidies		2002	1.41	.	.	.	2.52	1.96	2.53
		2003	1.36	.	.	.	2.27	2.02	2.57
Profit margin	coef.	2001	1.93	2.61	.	1.38	1.40	1.38	1.69
without subsidies		2002	1.28	1.90	.	1.56	1.35	1.18	1.26
		2003	1.16	1.63	.	1.44	1.11	1.25	1.29
Revenue/costs	coef.	2001	2.9	3.6	.	2.4	2.4	2.4	2.7
		2002	2.3	2.9	.	2.6	2.4	2.2	2.3
		2003	2.2	2.6	.	2.4	2.1	2.3	2.3

Source: see Table 1

Table 5. Slovakia's competitiveness in the production of rape seed vis-à-vis selected countries from the perspective of variable costs and gross margin

Rape	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	171	204	224	209	216	216	206
		2002	177	204	220	230	245	245	233
		2003	203	243	243	234	260	260	247
Yield	t/ha	2001	2.5	2.9	2.4	1.9	3.7	2.6	2.7
		2002	2.3	2.3	2.6	1.6	3.4	2.3	3.2
		2003	1.0	1.6	1.8	1.5	2.9	1.8	3.1
Total revenue per tonne of product	EUR/t	2001	194	203	224	209	305	345	329
		2002	189	204	220	230	343	391	339
		2003	266	238	243	234	373	440	356
Basic variable costs per tonne of product	EUR/t	2001	96	63	102	77	85	99	92
		2002	109	114	95	89	92	114	78
		2003	310	172	141	98	110	147	81
Profit per tonne of product	EUR/t	2001	75	141	122	132	131	117	114
		2002	68	90	125	141	153	131	155
		2003	–108	71	102	136	150	113	166
Gross margin per tonne of product	EUR/t	2001	98	140	122	132	220	246	237
		2002	80	90	125	141	250	276	261
		2003	–44	67	102	136	263	293	275
Profit margin with subsidies	coef.	2001	1.03	.	.	.	2.58	2.48	2.58
		2002	0.73	.	.	.	2.71	2.41	3.36
		2003	–0.14	.	.	.	2.40	2.00	3.39
Profit margin without subsidies	coef.	2001	0.78	2.25	1.19	1.73	1.54	1.18	1.24
		2002	0.62	0.79	1.31	1.59	1.65	1.14	1.99
		2003	–0.35	0.41	0.72	1.39	1.37	0.77	2.04
Revenue/costs	coef.	2001	1.8	3.3	2.2	2.7	2.5	2.2	2.2
		2002	1.6	1.8	2.3	2.6	2.7	2.1	3.0
		2003	0.7	1.4	1.7	2.4	2.4	1.8	3.0

Source: see Table 1

Table 6. Slovakia's competitiveness in the production of sunflower vis-à-vis selected countries from the perspective of variable costs and gross margin

Sunflower	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	187	248	.	232	.	175	250
		2002	225	258	.	276	.	280	280
		2003	201	199	.	210	.	190	235
Yield	t/ha	2001	2.0	2.2	.	2.0	.	2.5	2.2
		2002	2.2	1.9	.	1.9	.	2.6	2.4
		2003	1.9	2.2	.	1.9	.	2.8	2.2
Total revenue per tonne of product	EUR/t	2001	207	242	.	232	.	307	446
		2002	234	258	.	276	.	406	453
		2003	222	202	.	210	.	306	423
Basic variable costs per tonne of product	EUR/t	2001	83	82	.	67	.	140	97
		2002	78	119	.	70	.	134	88
		2003	90	106	.	71	.	127	98
Profit per tonne of product	EUR/t	2001	104	166	.	165	.	35	153
		2002	147	139	.	206	.	146	192
		2003	111	93	.	138	.	63	137

Continuation Table 6

Sunflower	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Gross margin	EUR/t	2001	123	160	.	165	.	167	349
per tonne		2002	157	138	.	206	.	272	365
of product		2003	132	95	.	138	.	179	325
Profit margin	coef.	2001	1.48	.	.	.	.	1.19	3.62
with subsidies		2002	2.02	.	.	.	.	2.03	4.16
		2003	1.46	.	.	.	.	1.41	3.33
Profit margin	coef.	2001	1.24	2.01	.	2.45	.	0.25	1.59
without subsidies		2002	1.90	1.16	.	2.93	.	1.09	2.19
		2003	1.23	0.87	.	1.94	.	0.50	1.40
Revenue/costs	coef.	2001	2.2	3.0	.	3.5	.	1.3	2.6
		2002	2.9	2.2	.	3.9	.	2.1	3.2
		2003	2.2	1.9	.	2.9	.	1.5	2.4

Source: see Table 1

Table 7. Slovakia's competitiveness in the production of sugar beet vis-à-vis selected countries from the perspective of variable costs and gross margin

Sugar beet	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	27	29	30	30	44	43	38
		2002	29	33	33	35	48	47	41
		2003	29	30	30	37	47	46	40
Yield	t/ha	2001	43.1	45.0	35.8	44.2	55.2	61.4	62.6
		2002	43.4	47.7	49.0	39.5	58.0	52.5	73.0
		2003	37.0	40.4	38.1	34.0	59.3	59.8	72.7
Total revenue	EUR/t	2001	32	29	30	30	44	43	38
per tonne of product		2002	33	33	33	35	48	47	41
		2003	32	30	30	37	47	46	40
Basic variable	EUR/t	2001	9	10	11	8	12	12	10
costs per tonne		2002	9	12	8	9	12	14	8
of product		2003	14	13	10	11	11	12	8
Profit per tonne	EUR/t	2001	18	19	20	22	32	32	28
of product		2002	20	21	25	26	36	33	33
		2003	15	17	19	26	36	34	32
Gross margin	EUR/t	2001	23	19	20	22	32	32	28
per tonne		2002	24	21	25	26	36	33	33
of product		2003	18	17	19	26	36	34	32
Profit margin	coef.	2001	2.56	.	.	.	.	.	.
with subsidies		2002	2.61	.	.	.	.	.	.
		2003	1.30	.	.	.	.	.	.
Profit margin	coef.	2001	2.06	1.82	1.84	2.57	2.62	2.71	2.95
without subsidies		2002	2.17	1.78	3.15	2.75	3.11	2.43	3.97
		2003	1.07	1.31	1.86	2.36	3.10	2.80	3.83
Revenue/costs	coef.	2001	3.1	2.8	2.8	3.6	3.6	3.7	3.9
		2002	3.2	2.8	4.2	3.7	4.1	3.4	5.0
		2003	2.1	2.3	2.9	3.4	4.1	3.8	4.8

Source: see Table 1

With the exception of Poland, Hungary and France, the basic variable costs of 1 tonne of sugar beet were higher in the observed countries than in Slovakia. Excluding subsidies, Slovakia would not achieve the same profit margin in the production of sugar beet as other countries with the exception of the Czech Republic. While Slovakia made 2.8 Euro per 1 Euro of the invested variable costs, the highest figure (4.6 Euro) was achieved in France.

Potatoes in Slovakia belong among the crops with one of the highest prices and lowest per hectare yields from all the monitored countries. Unlike other countries, the production of potatoes was heavily subsidised in Slovakia. The costs of seeds, fertilisers and chemical protection were much higher in Slovakia and Hungary than in other countries. Basic variable costs in Poland in 2001–2003 were for instance by 78% lower than those in Slovakia. The individual countries had a varying profit margin on the invested costs. The highest profit margin without subsidies was achieved in Poland, followed by the Czech Republic and Germany. While the profit margin in Austria excluding subsidies was 0.87, it was 1.01 in Slovakia. Inputs into production were most efficiently invested in Poland, where 5.8 Euros were made on 1 Euro (2 Euros in Slovakia) (Table 8).

The Table 9 compares the average basic variable costs, revenue, profit margin and the quantity of production per 1 Euro of inputs into the production of selected crops in the observed countries in years 2001–2003.

CONCLUSION

The article focuses on the analysis of the competitiveness of crop production in terms of basic variable costs (costs of seeds, fertilisers and chemical protection), comparable in all monitored countries. At the same time, I analysed the total revenue, profit margin, the quantity of production per 1 Euro of invested inputs and profit. The profit margin and profit were calculated in two variants - with and without subsidies. Slovakia subsidised all observed crops, which is reflected in the gross margin figures. Similarly, the EU-15 countries subsidised all the crops subject to observation with the exception of root and

Table 8. Slovakia's competitiveness in the production of potatoes vis-à-vis selected countries from the perspective of variable costs and gross margin

Potatoes	Unit	Year	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Price	EUR/t	2001	101	101	75	114	65	81	80
		2002	116	104	75	112	63	75	62
		2003	144	168	73	200	85	130	79
Yield	t/ha	2001	17.3	20.9	16.2	25.0	42.2	30.0	37.4
		2002	19.3	27.0	18.0	19.5	38.6	27.5	39.3
		2003	16.4	21.1	17.9	18.8	34.6	26.5	40.0
Total revenue	EUR/t	2001	134	101	75	114	65	81	80
costs per tonne		2002	133	104	75	112	63	75	62
of product		2003	172	168	73	200	85	130	79
Costs (basic variable	EUR/t	2001	59	31	14	46	20	47	34
costs) per tonne		2002	55	35	12	58	22	52	33
of product		2003	66	46	13	62	24	54	32
Profit per tonne	EUR/t	2001	43	70	61	68	45	34	46
of product		2002	61	69	63	54	41	23	29
		2003	78	122	60	138	61	76	47
Gross margin	EUR/t	2001	76	70	61	68	45	34	46
per tonne		2002	78	69	63	54	41	23	29
of product		2003	107	122	60	138	61	76	46
Profit margin	coef.	2001	1.29	.	.	.	.	.	.
with subsidies		2002	1.42	.	.	.	.	.	.
		2003	1.63	.	.	.	.	.	.
Profit margin	coef.	2001	0.73	2.25	4.49	1.47	2.30	0.73	1.33
without subsidies		2002	1.12	1.97	5.05	0.93	1.90	0.45	0.89
		2003	1.19	2.64	4.71	2.24	2.49	1.42	1.43
Revenue/costs	coef.	2001	1.7	3.3	5.5	2.5	3.3	1.7	2.3
		2002	2.1	3.0	6.1	1.9	2.9	1.5	1.9
		2003	2.2	3.6	5.7	3.2	3.5	2.4	2.4

Source: see Table 1

tuber crops. The gross margin data on the Czech Republic, Poland and Hungary are provided excluding subsidies.

From the perspective of basic variable costs of 1 tonne of produced crop in the period 2001 to 2003, the costs in Slovakia are lower, i.e. it is compatible vis-à-vis:

– the observed EU-15 countries as regards cereals, sunflower and sugar beet (with the exception of France),
– the Czech Republic as regards barley, sunflower and sugar beet,
– Poland as regards wheat and barley
– Hungary as regards barley.

Slovakia's profit margin, calculated as the gross margin over the basic variable costs (including subsidies) is lower than that of the EU-15 countries.

The situation is different when we consider the average profit margin for the period 2001–2003 calculated excluding subsidies. The average profit margin achieved in Slovakia and other V-4 countries is 1 plus. The produc-

Table 9. Comparison of basic variable costs (Slovakia = 100%), profit margin and quantity of production per 1 Euro of inputs (on average for years 2001–2003)

	Slovakia	Czech Republic	Poland	Hungary	Germany	Austria	France
Basic variable costs per tonne							
wheat	100	99	105	99	112	142	98
rye	100	.	43	76	121	123	121
barley	100	103	126	102	119	143	117
maize	100	87	.	99	125	122	120
rape	100	68	66	51	56	70	49
sunflower	100	123	.	83	.	159	112
sugar beet	100	110	90	90	110	117	81
potatoes	100	63	22	93	37	85	56
Profit margin with subsidies							
wheat	1.50	.	.	.	2.29	1.81	2.83
rye	1.44	.	.	.	1.94	2.02	2.03
barley	2.09	.	.	.	3.73	2.35	3.10
maize	1.63	.	.	.	2.46	2.05	2.69
rape	0.54	.	.	.	2.56	2.30	3.11
sunflower	1.65	.	.	.	.	1.54	3.70
sugar beet	2.16	.	.	.	.	.	.
potatoes	1.45	.	.	.	.	.	.
Profit margin without subsidies							
wheat	*1.32*	*1.27*	*1.70*	*1.48*	*1.27*	*0.69*	*1.63*
rye	*1.07*	.	*3.63*	*1.71*	*0.74*	*0.43*	*0.61*
barley	*1.89*	*1.47*	*1.47*	*1.26*	*2.13*	*0.82*	*1.69*
maize	*1.46*	*2.05*	.	*1.46*	*1.29*	*1.27*	*1.42*
rape	*0.35*	*1.15*	*1.07*	*1.57*	*1.52*	*1.03*	*1.76*
sunflower	*1.46*	*1.35*	.	*2.44*	.	*0.61*	*1.73*
sugar beet	*1.77*	*1.64*	*2.28*	*2.56*	*2.94*	*2.65*	*3.58*
potatoes	*1.01*	*2.29*	*4.75*	*1.55*	*2.23*	*0.87*	*1.22*
Revenue/costs							
wheat	2.3	2.3	2.7	2.5	2.3	1.7	2.6
rye	2.1	.	4.6	2.7	1.7	1.4	1.6
barley	2.9	2.5	2.5	2.3	3.1	1.8	2.7
maize	2.5	3.0	.	2.5	2.3	2.3	2.4
rape	1.4	2.2	2.1	2.6	2.5	2.0	2.8
sunflower	2.5	2.3	.	3.4	.	1.6	2.7
sugar beet	2.8	2.6	3.3	3.6	3.9	3.6	4.6
potatoes	2.0	3.3	5.8	2.5	3.2	1.9	2.2

Source: VÚEPP Bratislava

tion of the majority of the observed crops without subsidies in Austria would not be as profitable from the perspective of variable costs as the production with subsidies and the profit margin for all crops except maize, rape and sugar beet would be below 1. The profit margin in the production of rye would be lower also in Germany and France. Production of wheat, rye and potatoes is most profitable in Poland, barley is most profitable in Germany, sunflower in Hungary and sugar beet and rape seed in France.

When we consider the effectiveness of the basic variable inputs into production (seeds, fertilisers and chemical protective), the V-4 countries gain more per 1 Euro of invested costs than the EU-15 countries in rye, sunflower and maize. The situation is opposite in sugar beet production. In this perspective, Slovakia is in a very good position in the production of barley.

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