

The Czech pre-accession agricultural policy – background, goals, constraints

Předvstupní zemědělská politika ČR – východiska, cíle, omezení

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Abstract: The paper summarises institutional procedures linked with the formation and implementation of the Czech pre-accession agricultural policy and presents an analytical background of the policy, including the discussion on visions and goals supported by the policy. To the conclusion, it recapitulates constraints and barriers for the implementation of the policy.

Key words: agricultural policy, EU, institutions, SWOT analysis of the Czech agro-food sector, goals of policy

Abstrakt: Článek sumarizuje institucionální procedury spojené s přípravou a zaváděním předvstupní zemědělské politiky ČR a představuje analytické pozadí této politiky, včetně stručné diskuse k vizím a dlouhodobým cílům, které jsou politikou podporovány. V závěru rekapituluje omezení a překážky, které stojí před zavedením předvstupní zemědělské politiky ČR.

Klíčová slova: zemědělská politika, EU, instituce, analýza SWOT agrárního sektoru ČR, cíle politiky, omezení politiky

INTRODUCTION

The Czech agro-food sector, as other sectors of the national economy, has been preparing for the EU accession. The entry into the EU has become a main “driving force” for agricultural policy makers. Nevertheless, the preparation for the EU accession hides many problems, the solution of which would be necessary for the Czech agro-food sector regardless the entry. From this point of view, the entry into the EU becomes an accelerator of needed changes and the progress.

In 1998, after the establishment of the new social democratic government, the works on a new agricultural policy, which would integrate the programme declaration of the government and would prepare conditions for the adjustment of the Czech agro-food sector to the more demanding conditions in the EU, have been initiated by the government. The works concurred positive results of the conceptual studies, which were prepared under the Ministry of Agriculture in 1995–1997 and which gathered tens of top professionals of many fields.

The paper aims to characterise main issues of the new policy, its analytical background, goals and constraints for realisation. Part 1 focuses in a concise way on the procedural issues linked with the preparation of the new policy. In the form of an aggregate SWOT analysis of the present situation of the Czech agro-food sector, part 2 reveals the analytical background of the policy. Part 3 recapitulates broader discussions on visions and long-term goals, connected with the functioning of the Czech agro-food sector under the EU conditions. Part 4 presents most serious barriers and constraints for the reali-

sation of the pre-accession agricultural policy. To the conclusion, some general implications for the policy makers, derived from the previous parts, are presented.

I. PROCEDURES RELATED TO THE PREPARATION AND REALISATION OF THE CZECH PRE-ACCESSION AGRICULTURAL POLICY

The works on the new policy started immediately after the elections in 1998, under the direct gestion of the new minister of agriculture and with the significant help of the Research Institute of Agricultural Economics (RIAE). To the contrary from an “open democratic” approach with broad and permanent discussions, characteristic for the previous strategic works, a more time and labour saving interactive approach was applied for the policy-making procedures. The principal works were provided by only a very narrow “professional club”, which formulated – utilising also the results of the previous conceptual studies – basic features of the new policy, including options or variants. The basic documents were repeatedly discussed with the representatives of the state administration, research, producers, etc. Last but not least, there were also discussions with politicians, who set the basic dimensions, the financial framework and the orientation of the policy. Under this procedure, the document “The conception of the Czech Agricultural Policy for the Pre-Accession Period” was prepared in the early spring of 1999.

At that time, the document was brought before the economic ministers of the Czech government and soon

after that, also before the government as an informative document. At the same time and in accordance with the Czech legislation, the procedure of the Environment Impact Assessment (EIA) of the document started. The assessment went through the remaining part of 1999. Thanks to the programme orientation of the new policy on environmental issues, the document was assessed in principle positively, even though in case of some market price support measures, linked with the adoption of the Common Agricultural Policy (CAP), fears of their possible negative environmental impacts were stressed. After the amendments reflecting the conclusions of the EIA, the document was brought before the government for the approval. In January 2000, the government accepted the programme basis of the new policy, however, without its financial framework.

Nevertheless, the concept of the Czech pre-accession agricultural policy functions as a general framework and background for all government actions and activities related to the EU accession and even to the Czech position toward the WTO negotiations in the field of the agro-food sector. In 1999, the government prepared the National Programme for the Adoption of *Acquis* for the period up to 2002, including the agro-food *acquis*. The programme is continuously updated based on the screening procedures, which have started in 1998. The document is transformed into the domestic plan of actions, the so-called Implementation Strategy. Based on the programme and other issues, the government prepared (in 1999) the Position Document. The document concentrates on the national positions for the future negotiation procedures. The main critical points for EU accession prove to be price alignment, the implementation of the Integrated Administrative and Control System and the Farm Accountancy Data Network, and the open questions related to compensation payments and production quotas.

At the same time, the Ministry of Regional Development together with the Ministry of Agriculture worked out the Rural Development Plan as a preparation for the pre-accession EU support in this field (SAPARD). The plan is now under the evaluation provided by the European Commission. Concurrently, the government has been preparing conditions for the establishment of the required institutions (Payment Agency, implementation institutions, etc.). The preparation for the future EU structural support concentrates on the prepared National Development Plan, oriented also on rural development and on the multifunctional agriculture.

The agricultural strategy was included into the "Economic Strategy for EU Accession: Competitiveness – Growth – Employment – Solidarity", prepared by the government in 1999. At present, under the initiation of the tripartite (government, employers, trade unions), the government is working on a study regarding impacts of the EU accession on prices, consumers and social situation, including food prices and rural employment.

For all the mentioned activities and documents, the pre-accession agricultural policy forms a general framework in the field of the agro-food sector.

2. ANALYSIS OF THE PRESENT CZECH AGRO-FOOD SECTOR – A BACKGROUND FOR THE PRE-ACCESSION AGRICULTURAL POLICY

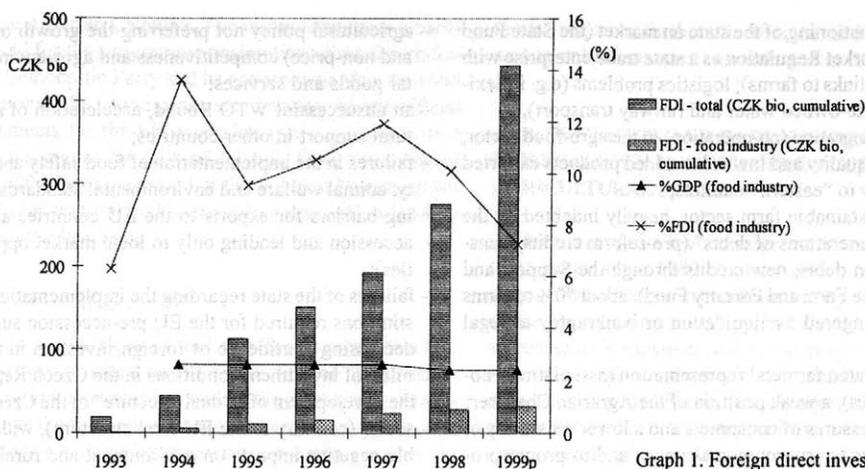
The pre-accession agricultural policy issues from versatile analyses of the development of the agro-food sector during the reform in the context of the general reform of the national economy. The analyses covered all decisive aspects of the sector, particularly agricultural market and trade issues, economic situation of farms and downstream firms, land, labour and capital markets, environmental and rural issues. Besides the partial analyses, the RIAE, in collaboration with foreign experts, provided more comprehensive analyses, e.g. a complex evaluation of possible impacts of the EU accession on the Czech agro-food sector, an assessment of competitiveness and effectiveness of the Czech agro-food sector (FAO, ACE-EU projects) and also a complex evaluation of the efficiency of the agricultural policy reform. The following part presents a summary of the analytical works and studies in the form of an aggregate SWOT analysis of the present Czech agro-food sector, including conditions for its functioning and restructuring.

STRENGTHS

- the low share of agriculture in GDP and employment (1,8% in 1998 and 1,3% in 1999 according to the Economic Account for Agriculture; about 4% of employment);
- flexible, inventive, skilled and cheap manpower;
- a good historical background for the state administration (e.g. land cadastral system, veterinary and phytosanitary institutions);
- relatively (compared with other sectors) good progress in farm restructuring; emerging medium and large-scale farming of individual farmers (300–600 ha in size) with labour, land and capital adjustments;
- the growing importance of organic farming and bio-products (almost 3% of agricultural area; two thirds of production are exported);
- rapidly growing foreign direct investments in food industry bringing in the management (including the quality management) and technologies "on the green meadow" of a higher quality (see Graph 1);
- a very rapidly developing retail sector based on multinational networks, a sharp competition in the retail sector with positive pressures and impacts on upstream (supplying) firms.

WEAKNESSES

- general soil and climatic conditions for farming (two thirds of agricultural land in less favourable areas) compared with a very high share of arable land in agricultural land (about 72%, with only a small decrease during the reform period);
- lower efficiency of the state management and administration:



Graph 1. Foreign direct investments

- a latent tendency to pre-reforms patterns of the management and administration (interests of the state bureaucracy – a generation problem),
- weak institutional infrastructure of the society, national economy and agro-food sector (justice, enforcement of laws and contracts, problems with customs authorities),
- an obsolete technical and know-how equipment of the state monitoring, testing and controlling institutions,
- too centralised administration,
- lower cost/price competitiveness of agricultural products compared with the world market conditions (see Table 1), aggravated by over-capacities in food industry (30–60%) and by a lower efficiency of processors, intermediaries and wholesale firms (unequal distribution of margins among farms – processors – sale firms as a consequence of bad terms of trade for farmers);
- lower non-price competitiveness of agricultural products and production:
 - problems with the implementation of food safety and quality standards, with the implementation of the HACCP systems in food industry enterprises (only 4% of enterprises processing red meat are eligible for exporting products to the EU),
 - problems with environmental and animal welfare standards according to the EU requirements (waste technologies, cage rearing of poultry, stanchion housing of cattle and pigs),
 - undeveloped grading and classification systems (e.g. SEUROPE),
 - undeveloped market information systems for producers,
 - undeveloped wholesale sector and marketing channels: too many small, dispersed and weak sale and trade firms without marketing experience as a consequence of the destroying of domestic networks and

Table 1. Indicators of competitiveness of the Czech agriculture

Commodity	SCAC			NPC			(RP + T)/FGP				% PSE		
	1997	1998	2002	1997	1998	1999	2002	1997	1998	2002	1997	1998	1999
Wheat	0.54	0.07	0.14	-4	18		-8	1.29	1.03	1.32	-9	10	3
Barley (coarse grains)	0.43	-0.07	-0.13	-5	16		8	1.29	1.05	1.12	-11	22	-8
Rape seeds	0.22	0.20	0.00	-6	-3		9	1.77	1.69	1.46	-25	-27	-16
Sugar	-0.32	-0.35	-0.28	14	6		22	1.24	1.14	1.19	23	20	38
Milk	-0.32	-0.41	-0.44	29	67		123	1.11	0.84	0.62	30	43	36
Beef meat	-0.29	-0.29	-0.12	2	6		17	1.35	1.29	1.14	13	17	8
Pig meat	-0.05	-0.22	-0.13	-8	28		34	1.54	1.10	1.03	-1	6	43
Poultry	0.05	0.05	-0.07	-12	-9		9	1.68	1.62	1.34	31	40	42
Eggs											34	38	40

SCAC – Social Cost Adjustment Coefficient; NPC – Nominal Protection Coefficient; RP – Reference (World) Price; T – Tariff; FGP – Farm-Gate Price; PSE – Producer Support Estimate

Source: Agricultural Policies in OECD Countries. OECD 1999; calculations and predictions of the RIAE

- the functioning of the state on market (the State Fund for Market Regulation as a state trade enterprise with direct links to farms); logistics problems (e.g. inflexible state-owned water and railway transport);
- low integration (co-operation) in the agro-food sector,
- lower quality and low value added products exported mainly to “eastern” markets;
- the unsustainable farm sector, heavily indebted by the “three generations of debts” (pre-reform credits, transformation debts, new credits through the Support and Guarantee Farm and Forestry Fund): about 70% of farms are endangered by liquidation or bankruptcy as legal entities;
- disintegrated farmers’ representation (associations, co-operatives), a weak position of the Agrarian Chamber;
- lower pressures of consumers and a lower sensitivity of producers to environmental issues and to proper production practices;
- continuing barriers on input markets impeding the restructuring of farms, particularly on the land market (discrepancy between ownership and use of land, land tax paid by users, problems with physical identification of plots, uncompleted privatisation of the state land) and on labour market (e.g. moral barriers of releasing surplus workers from collective farms, lower mobility of labour in rural areas);
- agriculture has ceased to be a main source of income for the rural population;
- the high share of household expenditures on food (about 30%, but much more in the households of pensioners and of young families with children, up to 50%).

OPPORTUNITIES

- agricultural policy preferring the growth of (price and non-price) competitiveness and agro-environmental goods and services to the social issues and income support;
- vertical and horizontal integration within the agro-food sector, the growing share and role of foreign direct investments in the integration;
- further liberalisation under the WTO Round, CEFTA and European Agreement;
- looking for market niches : regional and geographically protected products, products of organic farming;
- agriculture producing bio-energy and other agricultural products of non-food use;
- agriculture producing environmental goods and services, including landscape and rural heritage maintenance;
- utilisation of the EU pre-accession support (SAPARD, PHARE) for modernisation and diversification of enterprises;
- higher concern of consumers to the environmental and rural issues.

THREATS – RISKS

- an extreme prolongation of the date of the entry into the EU;

- agricultural policy not preferring the growth of (price and non-price) competitiveness and agro-environmental goods and services;
- an unsuccessful WTO Round, acceleration of agricultural support in other countries;
- failures in the implementation of food safety and quality, animal welfare and environmental standards (creating barriers for exports to the EU countries after the accession and leading only to local market opportunities);
- failures of the state regarding the implementation of institutions required for the EU pre-accession support;
- decreasing confidence of foreign investors in the stability of investment conditions in the Czech Republic;
- the development of a “dual structure” of the Czech farm sector (contrary to the EU farm structure), with possible negative impacts on environment and rural development;
- the abandonment of land, agricultural production and consequently villages: risks of the deterioration of landscape and the depopulation of rural areas;
- a significant social sensitivity of on the food prices increase, creating barriers for the price alignment with the EU.

3. VISIONS AND GOALS SUPPORTED BY THE CZECH PRE-ACCESSION AGRICULTURAL POLICY

The forthcoming date of the EU accession and the growing problems in agriculture and rural areas have finished a long-term “sleeping” of the society with respect to the fate of the Czech agriculture and have provoked many discussions among farmers, professionals and politicians. There are permanent and ever growing discussions on a long-term orientation of the Czech agro-food sector and the pre-accession agricultural policy. Naturally, a many-sided preparation of the Czech agro-food sector and the state administration and institutions for the EU accession is a main policy orientation. However, this general goal should be accompanied by the national interests reflecting questions, which type of the Czech agriculture and the agro-food sector would be the most viable and profitable under the EU conditions.

From the discussions and also from the previous studies, it is possible to extract four types of visions reflecting “future pictures” of the Czech agro-food sector. Each vision is supported by different interest groups and political parties. The short characteristics of the visions are as follows:

Vision A – EXPANSION

The Czech agriculture and agro-food sector is mainly oriented on the expansion of the traditional agricultural production. Surpluses, issuing from the expansion, are exported (largely with subsidies). The vision is supported by the majority of producers, represented especially

by the Agrarian Chamber. The vision forms also a background for the programme declaration of the Czech Social Democratic Party and its government after the 1998 elections. The vision penetrates into the current official documents for the EU accession (see e.g. the required national quotas for milk of 3.1 bill. litres and sugar of 500 000 tonnes presented in the Position Document for the EU accession, highly exceeding the level of production in the last years).

Vision B – LANDSCAPE

The Czech agriculture and agro-food sector is in a balanced way oriented on the production of "traditional" agricultural commodities and on the production of environmental goods and services. The environmental goods and services, based particularly on extensive farming practices, are provided largely in the less-favourable areas covering up to 50% of the present agricultural land. The vision is supported more by the "moderate" right-wing politicians, by some representatives of individual farmers and by environmentalists and ruralists.

Vision C – NATURE

Czech agriculture is allocated only to the regions with better soil and climatic conditions, it means about 40% of the present agricultural area. In these regions, a traditional and intensive agricultural production is provided. The remaining part of the agricultural area is gradually afforested or converted into a "wild nature". The vision is supported by strict liberals or by ecologists.

Vision D – WATER

The Czech Republic is the basin and the watershed of many waterflows reaching several seas (Baltic, Northern, Black Sea). About 20% of the present agricultural area belong to the protected areas of the natural water accumulation. Czech agriculture is oriented mainly at the water economy, it means at the production of clean water for households and industry. Owing to the trans-boundary dimension of the Czech water economy, it is possible to consider "export activities" in this field. In an extreme situation, the whole or a larger part of the Czech agricultural area is declared as a "nitrate sensitive area". Beside this, agriculture is involved in retention systems protecting regions from floods (as a consequence of catastrophic floods in the recent years).

Each of the presented visions presupposes a different type of structural adjustments linked with adequate investment activities of the state and private entities. The pre-accession agricultural policy openly declares that the European Model of Agriculture with the multifunctional role of agriculture is the leading vision for the Czech agriculture under the EU conditions. The European Model of Agriculture is very closely related to the LANDSCAPE vision. However, the acceptance of the

model requires further discussions and explanations among politicians, professionals and in the public.

4. CONSTRAINTS AND BARRIERS RELATED TO THE REALISATION OF THE PRE-ACCESSION AGRICULTURAL POLICY

We can recognise several stages of the reform agricultural policy since 1989. A short period of the starting stage (1990–1991) was characterised by the application of many pre-reform measures, but also by the abolition of consumer's subsidies and by the price liberalisation. After the 1992 elections and the establishment of the right-wing government, the liberal stage (1992–1993) removed almost all-direct support to farmers. During this stage, the basic trade commitments were prepared especially commitments under the GATT UR and under the European Agreement. These commitments, very liberal compared with the real economic situation of the country and even with the developed countries and regions (particularly with the EU – see Table 2), will be influencing the agricultural policy framework up to the EU entry. Since 1994, the stabilisation stage of the policy has started with the growing importance of direct income and market price support for farmers. This orientation accelerated after the 1998 elections, it means after the establishment of the social democratic government, and has been to some extent included into the last pre-accession stage covered by the pre-accession agricultural policy.

The reform development of the Czech agricultural policy and comparisons with the selected countries and regions are shown in Graph 2 (Producer and Consumer Support Estimates development – PSE and CSE in 1989–1999), Table 3 (comparisons of PSE) and Table 4 (comparisons of transfers).

The overall view on the structure and orientation of the Czech agricultural policy in the years 1995–1999 is presented in Table 5 (structure according to orientation and forms of supports) and Table 6 (structure according to long-term goals).

From the real and more informal political point of view, the pre-accession agricultural policy aims at:

- the stabilisation and improvement of social conditions for the agricultural population through market price support and through direct income support, to increase the level of the support close to the EU level before the accession;
- through market price support and other measures to adjust price differences between the Czech and the EU agro-food sectors, to eliminate the shock effect for consumers after the entry;
- the implementation and testing of the CAP and other EU measures, institutions and mechanisms before the accession, to be able to absorb the EU agricultural and structural support after the entry.

To meet these objectives, the pre-accession agricultural policy is divided into two periods (phases). The phase

Table 2. Custom tariffs (1998) and supports for agriculture (average of 1996–1998)

Commodity	Czech Republic			Hungary				Poland			EU		
	GT	RT	PSE	NAC	GT	PSE	NAC	GT	PSE	NAC	GT	PSE	NAC
TOTAL	47.8	15.4	13	1.15	47.9	10	1.11				100.1	39	1.65
Wheat	22.5	3.5	-5	0.99	30.0	-15	0.88	76/114 ECU/t	25	1.34	121.5	46	1.88
Barley	22.5	4.1	-8	0.97	35.5	-5	0.96	60.7/110.3 ECU/t	23	1.31	112.0	58	2.46
Rape	64.2	9.3	-5	0.95	0.0	16	1.19	33.0	16	1.20	0.0	48	1.92
Sugar	63.0	17.6	18	1.23	72.0	43	1.78	104/460 ECU/t	43	1.78	229.5	38	1.62
Potatoes	122.0	23.6			46.8			152			13.7		
Milk	41.2	5.8	34	1.55	60.8	40	1.73	121.3/2171 ECU/t	13	1.15	187.9	53	2.12
Eggs	18.0		31	1.45	40.5	47	1.93	106/1690 ECU/t	53	2.21	71.2	4	1.05
Beef meat	36.6	35.3	20	1.26	85.1	14	1.17	22.7 + 3716 ECU/t	6	1.08	180.3	53	2.20
Pig meat	40.9	35.8	4	1.07	54.9	6	1.06	90.7 + 1134 ECU/t	19	1.24	55.2	4	1.04
Poultry	46.7	3.7	10	1.15	46.3	25	1.33	90.7/max.1524 ECU/t	29	1.42	30.0	19	1.24

GT – general tariffs according to the commitments towards the WTO (% or min./max. values ECU/t, respectively)

RT – reduced tariffs (including trade agreements)(%)

PSE – Producer Support Estimate (%)

NAC – Nominal Assistance Coefficient

Source: OECD Monitoring 1999. Czech Statistical Office, the RIAE calculations

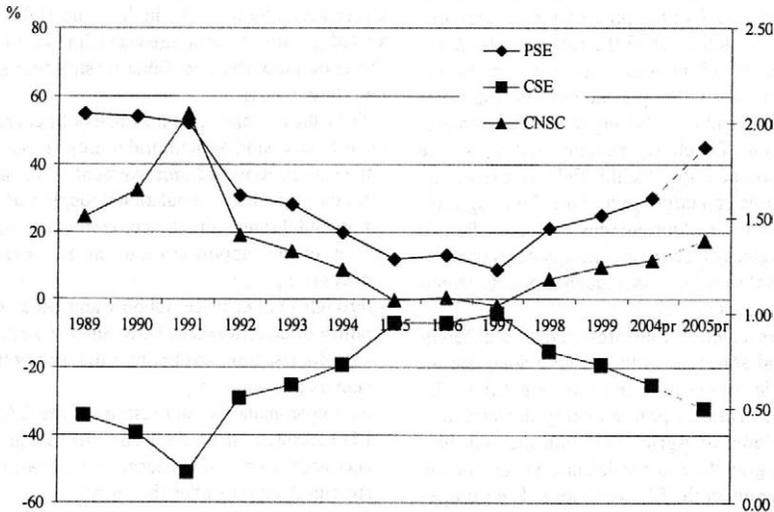
of REVITALISATION (1999–2001) consists of the measures following especially the first; social and income oriented objective. Nevertheless, the basic preparative works related to the other objectives are also supposed to be provided for during this phase.

The following phase of ADAPTATION (2002 till the entry) is fully oriented at all the mentioned objectives. The phase consists in four “pillars”:

- Pillar A: Market regulation and income support (including LFA support);
- Pillar B: Environmental services (EKO-0 – EKO-4 schemes);

- Pillar C: Modernisation, diversification;
- Pillar D: General services (including the institutional development).

Market price support in the pillar A is based on the political decision: Czech institutional (administrative) prices should approach EU institutional prices just before the supposed entry (considering the predicted development of the exchange rate). Another political requirement concerns the total level of all supports measured by the Producer Support Estimate: just before the supposed EU entry, the level of the Czech support should approach the EU level (PSE approximately 30–



Graph 2. Development of supports of consumers and producers in 1989–2005

Table 3. Producer Support Estimate (%) – comparison of countries

Country	1986–88	1997–99	1997	1998	1999			
					total	in that		
						market price support	input supports	income support
Czech Republic	59	18	9	21	25	70	14	12
Hungary	39	13	7	13	20	52	26	9
Poland	29	23	22	23	25	83	14	–
Slovak Republic	66	22	10	29	27			
EU	44	44	38	45	49	63	12	22
Switzerland	73	70	67	70	73	61	6	27
USA	25	20	14	22	24	40	14	3
Australia	8	7	7	7	6	36	49	12
New Zealand	11	2	2	1	2	78	21	–
OECD	40	36	31	36	40	68	11	11

Source: Agricultural Policies in OECD countries. OECD 1999

Table 4. Transfers to agriculture – comparison of countries

Country	Indicator	Unit	1986–88	1997–99	1997	1998	1999
Czech Republic	CNSP		2.48	1.23	1.10	1.26	1.33
	PSE/ha	USD	1 063	169	86	205	215
	total transfers/GDP	%	–	1.50	0.90	1.70	1.90
Hungary	CNSP		1.65	1.16	1.08	1.15	1.24
	PSE/ha	USD	463	107	64	112	145
	total transfers/GDP	%	–	1.70	1.10	1.80	2.20
Poland	CNSP		1.41	1.30	1.28	1.30	1.33
	PSE/ha	USD	209	190	189	203	178
	total transfers/GDP	%	–	2.60	2.80	2.70	2.40
EU	CNSP		1.79	1.79	1.61	1.82	1.95
	PSE/ha	USD	707	845	815	890	831
	total transfers/GDP	%	2.60	1.50	1.50	1.60	1.50
Switzerland	CNSP		3.67	3.37	3.06	3.30	3.36
	PSE/ha	USD	3 195	3 134	3 103	3 196	3 102
	total transfers/GDP	%	3.80	2.40	2.40	2.40	2.40
USA	CNSP		1.34	1.25	1.16	1.28	1.32
	PSE/ha	USD	98	106	73	116	129
	total transfers/GDP	%	1.40	1.00	0.90	1.00	1.00
Australia	CNSP		1.09	1.07	1.08	1.07	1.07
	PSE/ha	USD	3	3	3	3	3
	total transfers/GDP	%	0.80	0.50	0.50	0.50	0.40
New Zealand	CNSP		1.13	1.02	1.02	1.01	1.02
	PSE/ha	USD	34	7	10	6	7
	total transfers/GDP	%	1.90	0.40	0.40	0.30	0.40
OECD	CNSP		1.67	1.56	1.45	1.57	1.66
	PSE/ha	USD	187	205	189	209	218
	total transfers/GDP	%	2.30	1.40	1.40	1.50	1.40

CNSP – Coefficient of Nominal Support of Producers; PSE – Producer Support Estimate

Source: Agricultural Policies in OECD countries. OECD 2000

Table 5. Supports for the Czech agro-food sector according to their orientation and forms (CZK million)

Orientation	1995–1997			1998–1999			1995–1999		
	total	per year	%	total	per year	%	total	per year	%
A. Market price supports	27 529	9 176	50.0	41 885	20 943	59.5	69 414	13 883	55.3
– farm gate prices	19 002	6 334	34.5	41 724	20 862	59.2	60 726	12 145	48.4
– consumer prices	8 527	2 842	15.5	161	81	0.2	8 688	1 738	6.9
B. Direct supports	5 127	1 709	9.3	9 715	4 858	13.8	14 842	2 968	11.8
– related to commodities	1 119	373	2.0	2 691	1 346	3.8	3 810	762	3.0
– general	4 008	1 336	7.3	7 024	3 512	10.0	11 032	2 206	8.8
C. Input subsidies	12 408	4 136	22.5	11 528	5 764	16.4	23 936	4 787	19.1
– investment	9 193	3 064	16.7	7 396	3 698	10.5	16 589	3 318	13.2
– other supports	3 215	1 072	5.8	4 132	2 066	5.9	7 347	1 469	5.9
D. General services	9 965	3 322	18.1	7 300	3 650	10.4	17 265	3 453	13.8
Total	55 029	18 343	100.0	70 428	35 214	100.0	125 457	25 091	100.0
of which									
– agriculture	40 126	13 375	72.9	64 491	32 246	91.6	104 617	20 923	83.4
– food industry	2 474	825	4.5	2 488	1 244	3.5	4 962	992	4.0
– sale sector	3 790	1 263	6.9	3 238	1 619	4.6	7 028	1 406	5.6
– consumers	8 639	2 880	15.7	211	106	0.3	8 850	1 770	7.1
of which									
– tax-payers to producers	30 852	10 284	56.1	31 072	15 536	44.1	61 924	12 385	49.4
– consumers to producers	15 538	5 179	28.2	39 145	19 573	55.6	54 683	10 937	43.6
– tax-payers to consumers	8 639	2 880	15.7	211	106	0.3	8 850	1 770	7.1

Source: RIAE calculations

Table 6. Supports for the Czech agro-food sector according to long-term policy goals (CZK million)

Goals	1995–1997			1998–1999			1995–1999		
	total	per year	%	total	per year	%	total	per year	%
Development and stabilisation of firms	4 167	1 389	7.6	3 305	1 652	4.7	7 471	1 494	6.0
Restructuring and modernisation, increase of competitiveness	16 772	5 591	30.5	11 231	5 616	15.9	28 003	5 601	22.3
Income situation of firms	22 868	7 623	41.6	52 793	26 396	75.0	75 661	15 132	60.3
Environment and rural development	1 028	343	1.9	1 160	580	1.6	2 188	438	1.7
Non-food use of agricultural production (bioenergy)	1 556	519	2.8	1 729	865	2.5	3 285	657	2.6
Adequate prices for consumers, food safety	8 639	2 880	15.7	211	106	0.3	8 850	1 770	7.1
Total	55 029	18 343	100.0	70 428	35 214	100.0	125 457	25 091	100.0

Source: RIAE calculations

35%). The prediction of the budgetary expenditures issuing from the pre-accession agricultural policy for the period of 1999–2005 is presented in Table 7.

Just after the first presentation of the pre-accession agricultural policy to the government in 1999, the RIAE has started an “economic audit” of the policy (parallel with the environmental audit). It means, how political decisions and requirements included in the policy comply with the predicted Czech macroeconomic conditions, with budgetary limits, with the commitments towards the WTO, etc.

Table 7. Transfers to the Czech agro-food sector according to the pre-accession agricultural policy (CZK billion)

Pillar	1998	1999	2000	2000 ^b	2001	2002	2003	2004	2005
A	2.5	3.5	7.1	5.7	7.1	13.8	13.8	13.7	13.6
B	3.5	4.5	7.2	4.5	7.2	3.5	3.6	3.7	4.1
C	4.9	5.0	6.8	4.0	6.8	5.4	5.0	4.5	4.2
D	1.1	1.2	1.7	1.2	1.7	1.6	1.6	1.6	1.6
Total	12.0	14.2	22.8	15.3	22.8	24.4	24.1	23.6	23.6

b = budget 2000

Source: The Czech pre-accession agricultural policy. 2000

Table 8. Simulation of price scenarios

Indicator	Scenario A		Scenario B		Scenario C	
	2002 (CR)	2003 (EU)	2002 (CR)	2003 (EU)	2002 (CR)	2003 (EU)
Price index for the selected basket of agricultural commodities	1.038	1.043	1.000	1.154	1.012	1.099
Share of households expenditures on foods (%)	33	32	32	32	32	32
AMS (CZK billion limit CZK 13.6 bill.)	27.6	x	27.6	x	27.6	x
Export subsidies (CZK billion limit CZK 4.3 bill.)	9.9	x	5.6	x	7.4	x

AMS = Aggregate Measurement of Support according to the UR GATT Agreement

Source: RIAE calculation

The budgetary limits have immediately showed to be the first quite clear constraint. The discrepancies between the policy requirements and the budget were revealed in the first years of the policy realisation (see Table 7 – real budgetary figures for 2000 compared with the predicted figures for the same year, that is CZK 15.3 bio compared with CZK 22.8 bio).

In the framework of the “economic audit”, the possibilities of price alignment with the EU have been tested. Issuing from the defined prediction of the external factors (world prices, exchange rate, domestic prices of other tradable and non-tradable goods, etc.) development, the following three scenarios of the price alignment with the EU (or with Austria, respectively, as sub-scenarios) have been tested by the means of the RIAE models and other instruments:

- Scenario A (baseline): a gradual price alignment during the pre-accession period, just in line with the pre-accession agricultural policy price parameters.
- Scenario B: without price alignment during the pre-accession period (domestic farm-gate prices fixed at the 1999 level).
- Scenario C: with the application of maximum prices derived from the world (reference) prices plus tariffs under the WTO commitments.

Some simplifications have been considered. First, the date of the entry was presumed in 2003. Secondly, the analyses have not considered possible shifts on the demand and supply sides as a reaction to the price changes. In spite of these simplifications, the results of the analyses, presented in a short way in Table 8, demonstrate other serious constraints of the pre-accession policy. These constraints are connected with the WTO commitments (considered on the same level as in 2000), especially the commitments related to the Aggregate Measure of Support (AMS) indicator and to export subsidies. For several commodities, like milk, beef and pork,

there are also limits related to the tariff commitments (see also Table 1).

CONCLUSIONS

In conclusion, the budgetary and price framework of the pre-accession agricultural policy as an expression of the political decisions is not feasible under the predicted development of the external factors and under the current trade agreements. The price alignment shows to be a serious problem, even considering other factors, which should force the domestic prices to increase (especially additional investments on food safety, animal welfare and environmental issues).

The government and the Ministry of Agriculture is now standing before the decision, how to re-arrange the previous political requirements related to the level of institutional prices and other support. At the same time, it is a problem of the formulation of new preferences in the pre-accession agricultural policy. These tasks could be provided for without any serious changes in the general and principal orientation of the policy.

In short words, the state cannot afford farmers price, income and other supports, as the government declared them just after its establishment in 1998. As regards the preferences, considering the requirements stemming from the EU accession, the highest priority should be given to all measures and expenditures regarding building of needed state systems and institutions. The second priority should be given to all measures stimulating the restructuring, modernisation and price and non-price competitiveness. All other measures, still forming a substantial part of the real agricultural policy, should be adjusted according to the real economic possibilities and the trade commitments of the country.

Arrived on 5th October 2000

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An outline of the development of Slovak Agricultural Policies after 1990

Náčrt vývoja slovenskej agrárnej politiky po roku 1990

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Abstract: The paper reviews the evolution of agricultural policies implemented in Slovakia after 1990. In the first part, it gives a brief insight into the theoretical concept of agricultural policy per se and a short overview of the recent works dealing with the assessment of the Slovak progress in policy transformation within the group of countries in transition. The focal point of the paper is an analysis of the early approaches to re-shuffling the agricultural policy framework after the system change at the turn of the decade. Finally, the author presents his attempt to periodise the Slovak agricultural policy during the nineties, based on an analytical description of the explicit and implicit policy objectives and actions. In conclusion, some ideas on policy adjustments are presented, which respond to the challenges of the country's future accession to the EU.

Key words: agricultural policy, Slovakia, transformation, EU accession, periodisation

Abstrakt: Príspevok hodnotí vývoj slovenskej agrárnej politiky po roku 1990. V prvej časti sa zaoberá niektorými teoretickými aspektami a definíciami agrárnej politiky a informuje o výsledkoch zahraničných prác, ktoré hodnotili pokroky v transformácii v medzinárodnom porovnaní. V ďalšej časti sa sústreďuje na rozbor prvých predstáv o prestavbe poľnohospodárskej politiky po spoločensko-politických zmenách na prelome desaťročí. Autor rozdeľuje vývoj slovenskej poľnohospodárskej politiky na tri obdobia, a to na základe zmeny cieľov, a to tak deklarovaných ako aj skutočných a samotnej praxe. V záveroch sa uvádzajú návrhy na zmeny v nástrojoch a opatreniach, ktoré sú potrebné z hľadiska budúceho členstva Slovenska v Európskej únii.

Kľúčové slová: poľnohospodárska politika, Slovensko, transformácia, vstup do EÚ, etapizácia

INTRODUCTION

The period of transition of Slovak agriculture may be roughly framed by two dates, namely, January 1, 1991, when the Economic Reform Scenario was launched, and the year 2004, which is being most frequently mentioned as the earliest possible date of the country's full membership in the European Union. Altogether, two attempts at an explicit formulation of the national agricultural policy were made during this period, notably, in 1993 (The Concept and Principles of Agricultural Policy), and currently, when the executive and legislative bodies are in the process of adopting the Concept of Agricultural and Food Policies by the Year 2005. Although there are no significant differences between the two documents in terms of their goals and priorities, a very rough evaluation of their nature shows that the former was largely focused on the mitigation of the losses associated with the transformation. The concept under adoption is characterised by the fact that it anticipates indispensable adaptation processes connected with the preparation of our country for the EU accession.

As a rule, the implementation of an officially-stated policy digresses from the plans stated due to resource

constraints, and especially, the agency of interest groups. Therefore, its final form, at a certain period of time is, as a rule, an outcome of a tentative equilibrium between the conflicting interests, or, the capacity of interest groups to impact the creation of political tools.

It is believed that a decade that has lapsed from the time when the economy first embarked on transition to the market economy is not only a time of opportunities but also urges an unpreconceived evaluation in a long-term context.

The author of this paper makes such an attempt, although using imperfect means for the time being. Our attention is focused largely on the early stage, i.e. the period between 1990 and 1992, as it is believed that comparing the early transformation concepts with the present state may be a very interesting experience. Also, it is believed that the papers to follow will provide evidence that the most serious weakness of the hitherto development has been the non-existence of a target paradigm towards which the development in agriculture should have gravitated, or, the absence of a representative solid political formation that would formulate and enforce such a paradigm.

DATA SOURCES AND METHODS

The paper is based on an analysis and generalisation of the knowledge drawn from the literary sources quoted herein. In the first part, an attempt is made at a systematic approach to the problem, i.e. the definitions of the object and the agricultural policy set-up are presented. The next part focuses on the evaluation of agricultural policy for the sake of drawing methodology lessons and documenting the domestic development in the light of international comparison. Lastly, it categorizes the development periods of the Slovak agricultural policy, whereby the opinions on its shaping between the years 1990–1992 are exposed to a more detailed scrutiny.

RESULTS AND DISCUSSION

Definition of Agricultural Policy

Conventional definition of agricultural policy, as quoted in professional literature, is as follows: "Agricultural policy is a sum of all the plans, activities, and measures geared towards the arrangement, impacting and also direct determination of the course of economic processes in the agricultural sector. The objective of agri-political activities is to impact the economic conduct of private economic operators so as to have the output of individual economic activities result in a desired state of the entire economic sector" (Giersch 1960). The entities of the agricultural policy are the state, multinational institutions (the EU), and influential affinity organisations (farmers' unions, for instance).

The above statement indicates that agricultural policy is a matter of the implementation of the will of all the social entities, and (in a democratic social order) it is conceived via the institutions of a political system. Vital is the creation of the goals of agricultural policy ("desirable state") which, undoubtedly, has affinity with the interests of the parties to (vehicles of) agricultural policy. Since the parties are, in fact, the entities conceived in a political process, its course and outcome are vital for the creation of the goals of agricultural policy.

Generally, a nationwide consensus is usually reached in democratic countries on the issue of agricultural policy as a whole; even divergent political groupings at the supreme level are generally prone to accept the objectives of agricultural policy long-term. Most often, this concerns the drafting of agricultural laws which formulate a need to compensate the marginalisation of agriculture vis-à-vis other sectors of the economy due to the presence of natural and economic disadvantages of farming.

Title II, Article 39 of the Treaty of Rome (Nováčková 1999), sets forth the goals of Common Agricultural Policy as follows:

– to increase the productivity of agriculture by enhancing technological progress and ensuring a rational development of agricultural production and an optimal use of production forces, especially the workforce;

– to ensure an appropriate standard of living of the agricultural community, especially by increasing the individual income of persons productive in agriculture;

– market stabilisation;

– to provide the inhabitants with continuing food supplies;

– to supply the consumers with foodstuffs at affordable prices.

Furthermore, the Article states that in conjunction with launching and enforcing the common agricultural policy, the following will be observed:

– unique nature of agricultural activity following from the social structure in agriculture and structural natural differences across the individual agricultural regions;

– stepwise implementation of the relevant measures;

– the fact that in Member States, agriculture is a sector closely interconnected with the national economy as a whole.

The goals of agricultural policy are set forth indirectly in the Slovak Act on Agriculture (The Act No. 240/1998 Coll.), Article 1, Section 1, Par. 1, entitled Object of the Act as follows: The Act lays down support and protective measures to offset the natural economic disadvantages of the enterprise and risks in agriculture and promote its production and non-production functions geared towards providing the inhabitants with basic nutrition, food safety and competitiveness of domestic production, the protection of the components of the environment, and the sustenance of cultured rural regions.

By studying the legislation quoted above as well as that of other countries (Germany, Austria), a conclusion may be drawn that agri-political goals are largely protective by their nature, both within a state (agriculture competes with other sectors of the economy for production resources), and vis-à-vis other countries (in business competition with the countries having a more efficient agriculture). All in all, these goals are social by their nature (ensuring income, or, standard of living).

In general, a distinction is made among three areas of agricultural policy (Dichtl, Issing 1987), namely:

- a) agricultural price policy
- b) agricultural structural policy
- c) agricultural social policy.

The three areas stated above are distinct from one another by the object of their influence, and especially, the tools employed. While price policy is implemented (in the EU as well as other countries with market economy) largely via market organisation including indirect tools (conformable to the market) of influencing the market price, such as tariffs, countervailing duties at import and export, intervention buying-in, etc. structural and social policies involve largely direct payments.

The system of the tools that influence the market are shown in the Table 1.

In parallel with the so-called practical agricultural policy, scientific agricultural policy has evolved as a scientific discipline.

According to Streit (1991), the features of practical agricultural policy are as follows:

Table 1. Overview of the Tools That Influence the Market

Direct tools influencing the market		Indirect tools influencing the market	
Measures influencing	Measures on the domestic foreign trade	Legislative measures market	Measures designed to improve the market mechanism functioning
Tariff duties, additional duties, countervailing duties, surcharge on import, etc..	State intervention buying-in or sale	Foodstuff legislation	Product standardisation and classification
Import quota, ban on import	Taxes	Ban on direct sale of some products on the farmers' market (e.g., direct sale of milk to the consumer)	Consumer counseling
Technical barriers to trade	Subsidies	Land market regulation (limits to land transactions, lease regulation)	Promotion of marketing associations
	"Cap" and "floor" prices	Right of inheritance	Establishing a system of price reporting (market information)
		Stocking density limits (Livestock Units per hectare)	Establishment and furtherance of exchanges, large-scale markets, option exchanges

Source: Dichtl E., Issing O.: *Vahlens Grosses Wirtschaftslexikon*, 1987 (edited)

- 1) it constitutes part of practical politics and, hence, assumes that its entities are the vehicles of power,
- 2) it focuses on concrete objectives in solving material economic problems; however, these are derived from general objectives,
- 3) it leans on more or less credible assumptions about the economic connections between the goals and measures employed,
- 4) it is an outcome of the process of the creation of a political will; however, this process may be governed by its own regularities.¹

According to Koester (1992), the objective of scientific agricultural policy is a positive analysis of agricultural policy, i.e. the identification of the vehicles of the policy and bringing to light the actual impacts of individual measures and comparing them with plans and goals. The role of prescriptive analysis conducted by the scientific agricultural policy is to verify the correctness of the goals of the practical agricultural policy. Furthermore, its role is to diagnose the situation in the agricultural sector and explore the extent of its conformity with the stated goals of agricultural policy. Last but not least, the role of scientific agricultural policy is to explore what tools are most suitable to reach the desirable state, i.e. the goals of agricultural policy. Furthermore, scientific agricultural policy is destined to conduct projections, especially status quo projections, i.e. explore how the future situation will develop while the present agri-political decisions, or measures, remain unchanged. Lastly, its role is also to explore how changing the tools may affect the future si-

uation, i.e. what the effect of the anticipated changes in the tools and measures of agricultural policy are likely to be. To summarize, the agricultural policy research offers the following benefits:

- positive analysis (descriptions, explanations),
- prescriptive analysis (verification of the appropriateness of goals),
- diagnostic analysis (comparing goals with the actual state),
- status quo projections (anticipation of the future development under unchanged policy),
- impact projections (change projections using changed tools).

Apparently, it would be idealistic to expect a full accord between the recommendations and proposals of scientific agricultural policy and the measures of practical agricultural policy. While scientific agricultural policy attempts to cast an objective light upon the various connections based on the agency of economic regularities, practical agricultural policy is an outcome of the enforcement of interests by means of political power.

However, the objective of this paper is not to elaborate on these considerations in relation to the situation in the Slovak agricultural policy.

TRANSFORMATION AGRICULTURAL POLICY

The criteria of the agricultural policy in transitional economies cannot be compared with the criteria of the

¹The author attempted to bring this fact to attention in the above text.

agricultural policies in traditional market economies. While in the latter, a lasting stability of goals is obvious and the implemented reforms of the measures and tools employed are gradual by their nature², in the economies in transition, agricultural policy is largely destined to further changes. In this respect, examples of various models have been offered by countries in transition. Generally speaking, during the entire period after 1990, the policies of radical changes have been alternating with stabilisation policies. An example of a radical policy in changing the patterns of land use (i.e. the so-called land reforms which eliminated corporate forms of ownership in agriculture) are countries like Rumania, Albania, and Bulgaria. In the initial stages of reforms, the most dramatic changes in price and market liberalisation that resulted in a full opening of the market took place e.g. in Estonia.

A reform nature of agricultural policies is evaluated according to the attained stage of the reform advancement across the individual areas of the agri-food sector. As a rule, five areas stated below are assessed:

- price and market liberalisation
- land use restructuring (land reform)
- privatization of upstream and downstream sectors
- the system of agriculture finance
- establishment of an appropriate institutional framework.

Although the evaluation of the attained stage of the reform advancement is oftentimes marked by bias (ideological preconception) and a false interpretation of facts, some conclusions may be drawn against the background of international comparison. According to the World Bank evaluation (Csaki, Nash 1998), among the countries in which reforms have advanced most dramatically (i.e. their policies were most reform-oriented) are Hungary, Slovenia, and the Czech Republic. Altogether, the authors evaluated 25 countries, including associated countries, the Balkan countries, and the successor states of the former Soviet Union. For a more detailed explanation of the evaluation criteria, please refer to the source quoted above. To give an example, for prices and markets, countries are scored 1-10 to reflect the market reform

Table 2. Advancement of agricultural reforms in the CEE countries and the CIS (at June, 1997)
(1 - command economy, 10 - transition to market economy completed)

State	Price and market liberalisation	Land reform	Processing industry and input sectors	Agriculture funding system	Institutional framework	Scores total
Hungary	9	9	9	8	8	8.6
Slovenia	8	9	8	8	9	8.4
Czech Rep.	9	8	8	8	8	8.2
Estonia	10	6	7	7	9	7.8
Latvia	7	9	7	7	8	7.8
Poland	9	8	7	6	8	7.6
Slovakia	7	7	8	8	7	7.4
Armenia	7	8	7	7	8	7.4
Lithuania	7	8	7	6	7	7.0
Macedonia	7	7	8	4	6	6.4
Albania	8	8	8	3	5	6.4
Georgia	7	7	5	6	6	6.2
Rumania	7	7	6	6	4	6.0
Russia	7	5	7	6	5	6.0
Kirghizia	6	6	6	6	5	5.8
Moldova	7	6	7	5	4	5.8
Croatia	6	5	6	6	6	5.8
Kazachstan	7	5	7	5	5	5.8
Bulgaria	6	7	5	4	5	5.4
Ukraine	7	5	7	5	3	5.4
Azerbaijan	6	6	5	4	4	5.0
Tadzhikistan	4	2	5	3	5	3.8
Uzbekistan	4	1	1	1	4	2.2
Turkmenistan	2	2	1	1	3	1.8
Belarus	3	1	2	2	1	1.8
Average	6.7	6.1	6.2	5.3	5.7	6.0

Source: Csaki, Nash 1998

²A stepwise implementation of Mc Sharry's reform of the Common Agricultural Policy, of 1992, or, the Agenda 2000 measures scheduled long-term, serves a good example.

implementation stage, whereby the lowest score indicates a direct state control of prices and the market, and the highest score refers to the national markets with a fully developed competition and a minimum state intervention.

For details refer to the Table 2.

The Table 2 indicates that in 1997, Slovakia was placed roughly in the first third of the Table; however, it was placed last from among the Visegrad Four countries. In terms of market liberalisation, land reform, and the market economy institution building, our country was given fewer scores than the countries mentioned above. Therefore, a more detailed analysis of the concrete indicators underlying this evaluation is needed.

As regards market liberalisation, listed among the drawbacks of the enforced policies are (Czaki, Nash 1998, p. 68): non-transparent and non-systemic actions of the State Fund for Market Regulation, poor efficiency of the agriculture commodity trade, minimum guaranteed prices should not be derived from the cost basis and their level should be gradually reduced; milk quota should be lifted, and subsidies to marginalized production regions ought to be gradually transformed to targeted support programmes. In land reform, among the major problems listed are the fragmentation of land ownership, dormant land market, and others. To remedy the situation, a recommendation is made to introduce land purchase subsidies to productive farmers.

Even, if the above categorisation and scoring would not be very accurate, however, they are an impetus to a scientific analysis of the state, effects, and necessary changes in the presently enforced agricultural policy. A need to conduct such an analysis is also obvious from the 1998 Government Policy Statement which formulates a need to elaborate a new agricultural policy concept.

THE AGRICULTURAL POLICY OF SLOVAKIA, ITS DEVELOPMENT AND EVALUATION

Early-reform Concepts

During 1990, R&D workers, state administration, and reform politicians were fully engrossed in the considerations of the upcoming changes in the economic policy that would eliminate the distortions of the past and prepare the agricultural sector for a market economy. Effectively, an amendment of the economic mechanism adopted by the resolution of the Government of the CSSR No. 187/1988 served as a framework for numerous future plans. To establish an economic environment with the market principles and mechanisms predominating, it was deemed essential to:

“establish a non-inflationary environment, provide opportunities for the creation of new ownership relations, largely based on private and shareholding companies; eliminate price distortions and embark on price deregulation; exert competition pressure on producers, introduce internal currency convertibility and a new employment

concept; formulate state, structural industrial, agricultural, energy, and environmental policies” (Kuzma 1990).

The starting position, which was characterised by high food supplies in both relative and absolute terms and the farmers' income parity (clearly exceeding similar indicators of other countries), was rightly referred to as a factor “impeding the transition to a market economy” (Klinko 1990). Even more so, if this situation was an outcome of massive public transfers into agriculture. In 1989, these transfers totaled SKK 18.2 billion in the SR, of which the so-called supplementary price support amounted to SKK 14.2 billion, which evidences the extent of the distortion of both the agricultural prices and consumer prices. (Allusion is made to the consumer price subsidies that were allocated in an estimated amount of Kcs 10 billion annually) (Klinko 1990).

The author quoted above was very precise in naming the substance of the problem of corporate transformation (which is a lingering problem, largely due to the inertia of the mindset of market operators): “...experiences have shown that if the existing entities are to become rational market players, it does not suffice to grant them economic or legal independence, or, a self-governing status. To achieve this, companies are bound to overcome the monopoly of exclusivity, indispensability, or irreplaceability, and give up an idea that the obligation of the State is to guarantee every company a stable position in the market, continuing sales of all its production, and adequate income levels” (Klinko *ibid.*).

Generally it was understood that the reform was bound to guide the sector to a higher efficiency, and although the former Czechoslovakia was comparable with the advanced European countries in food and input consumption, effectively, it lingered behind in terms of productivity and efficient use of production inputs. “A solution will never be found, if a hackneyed argument is repeated that it is the supplier sectors of the national economy to be blamed for rising agri-food production costs” (Klinko 1990b).

The problem was to be resolved by a transition to a new socio-economic model of economy based on private ownership. As distinct from restitution and privatisation that were enforced in the official policy later on, in the initial stage of the “pre-reform” considerations an opinion was voiced that there had to be more “ways of the deetatization” of state ownership. The author (Klinko 1990b), together with others, is supportive of a method that would not transform the present state ownership to group or private ownership (via reprivatization or privatisation).

“It is believed that in both cases, one would be faced with a new expropriation of the vast majority of the population, because under the Slovak conditions, state ownership is, de facto, public (social) ownership, because the salvage value of the originally “nationalised” assets is very low...” (Klinko 1990b *ibid.*). The suggested way of doing this was to transfer state assets to the National Property Fund and lease all their production parts to economic operators for a rental fee equal to the annu-

ity of the reproduction value of the assets leased. A business solution was also sought for the land issue, as it was rightly assumed that the non-transparency and fragmentariness of land ownership would impede "the establishment of a private economic sector in agriculture" (Klinko 1990b).

At that time, a lot of ideas were reanimated about the prospects of agriculture as an integrating factor of the economy of rural areas, about an environment-friendly agriculture, and the prospects of developing an enclosed natural rural marketing cycle, in conjunction with the "low-input sustainable agriculture" model (Hutnik 1990).

Based on the proposals made, a complex task of the price rehabilitation in agriculture (production prices exceeded consumer prices) was to be resolved through a compromise. Given the fact that a radical solution that involved cutting the production costs down to the demand price level, or, an increase of production prices to the cost level with a simultaneous compensation of the inhabitants through salary and income adjustments (Klinko 1990c) was not feasible in practical politics, a solution was found in price regulation using guaranteed and guide purchase prices.

Stages of Agricultural Policy after January 1, 1991

In conjunction with the adopted Economic Reform Scenario launched in the national economy on January 1, 1991, the objective of the **First Stage** was to establish a market-oriented and efficient agricultural sector with a potential to compete internationally. Among the short-term reform goals, there were a speedy transformation and attuning the sector to new economic conditions.

In the focus of the speedy transformation, there were:

- setting up of new legal entities based on private ownership and settling of ownership rights to agricultural property,
- improvement of the market orientation of agricultural production with an objective to establish stable market conditions,
- improvement of the efficiency and competitiveness of farmers and food processors and an improved allocation of production across the regions with regard to their natural and market conditions.

At that time, the objective of the agricultural policy measures was to further a speedy restructuring of enterprise forms in agriculture (based on private ownership) and production (which entailed attuning to a situation in which the vital signals for a producer were those of the market). In parallel, the agricultural policy measures were to give some guarantees to economic operators in the stabilisation of market prices, regulated protection against foreign competition (customs policy, import quotas, countervailing duties) and protection against the monopoly of purchasers and suppliers of production inputs. To stabilise the market, tools were incorporated into the system the role of which was to mitigate dramatic price fluctuations (price reporting duty, for instance),

guaranteed prices (common wheat, rye, milk, slaughter bulls and heifers) and an intervention mechanism was triggered off via the market guarantee fund, or, the State Fund of Market Regulation. To promote the establishment of new private-based farms, the consolidation of land titles was launched and the transformation of cooperatives and the privatisation of state enterprises were implemented.

In addition, direct support and interest subsidies were implemented, the objective being the enhancement of production diversification, alternative agriculture, organic agriculture, environmental measures and the like, i.e. a wide range of measures to support the restructuring and environment-friendliness of agricultural production. Direct payments to enterprises operating in less-favoured areas were also introduced, along with the conversion of land use to less intensive forms and tax reliefs (uniform tax-free minimum of Kcs 1,200 per hectare of agricultural land, deferred tax payments on wages and remuneration totaling Kcs 2.8 billion in 1992 were discharged later on).

Budget costs allocated for the measures above totaled almost Kcs 10 billion in 1991, and in 1992, Kcs 7.3 billion. However, these amounts were by a third or even a half less than in 1989.

The outcome of this stage of agricultural policy was attuning agricultural production to the then existing demand, however, the much expected turnaround in the production efficiency and competitiveness did not occur. Several reasons accounted for that. The most relevant one was an excessive budget restriction (i.e. a drop in the income due to the change in market conditions – a dramatic disparity in prices and cuts of the public fund transfers), the immediate result being a drop in production intensity and a less efficient use of the invested fixed capital. (Costlier loans were also to be listed among the changed market conditions). Due to the enterprise liberalisation, agricultural enterprises were largely deprived of their non-agricultural income.

Changed ownership relations and an upheaval of the socio-political situation eroded the security of enterprise and the position of a qualified management. In addition, restructuring of business structure was not realized, and the implied boom of family farms did not happen. The formally transformed agricultural cooperatives continued to operate in the work-for-hire mode. Not much progress was reported in the transformation of state enterprises, and the promised land consolidation was progressing in a very slow pace. Purchasers maintained a monopsonic position and moreover, lived on supplier credit. A stringent budget climate (critical shortage of funds), coupled with other adverse circumstances (the restructuring of the business sector came to a deadlock, marketing was discontinued, the presence of price disparity), offered little motivation to invest human and financial resources in the rationalisation and higher efficiency of production.

The Second Stage of agricultural policy, for the implementation of which political preconditions were created by the establishment of an independent state in 1993, was focused on the agricultural sector stabilisation. Its for-

mally declared goals were based on the traditional goals of agricultural policies in the West-European countries; they were geared towards the protection and a sweeping furtherance of agriculture and accompanied by massive transfers on the part of consumers and taxpayers. After 1994, budget transfers increased annually, and to promote investments in the sector, off-budget funds were employed (income from privatisation). Several pragmatic solutions were adopted that contributed to the stabilisation of the marketing conditions of primary producers (the introduction of a fixed milk price in 1993 and premium payments) and the abatement of the poor sector liquidity (green loan guarantees, rediscount of green bills, and from 1994 onwards, cheap loans granted by the Support Fund). To improve the sector liquidity, the Fund of Market Regulation resorted to several acts which may be justified by a need to intervene into the market only with great difficulty. Since 1994, sweeping direct payments to support the purchase of operating inputs and investment subsidies for the machinery purchase have been upward-sloping and accounted for the investment rehabilitation and the input price growth.

After 1994–1996, which was a period of a moderate growth of agricultural production and improvement of the income indicators of companies, the constraints of sweeping stabilisation policies were manifested in the slump and cuts in 1997 and 1998 production and deteriorated 1998 figures. The reasons of this deterioration may be sought in natural disasters (which is especially true of 1998); however, other reasons may also account for this slump. Clearly, among the reasons are under-capitalisation of the sector and a shortage of operational funds. However, it is questionable whether under the conditions of a transitional economy it is feasible to offset this drawback by sweeping transfers of public funding, as evidenced by the hitherto stabilisation policy which has obviously hit its limits.

The next, **Third Stage** of agricultural policy, the objective of which is the sector preparation for accession to the EU single market, is to evaluate the experiences of the previous two stages. This will call for the completion of a task that has not been fully implemented by the First Stage, namely, a thorough restructuring of the micro-sector (including consolidation of land titles) and a better production allocation in line with the production conditions through a selective support of the individual production and regional segments of primary production. In addition, the role of the Third Stage is to attempt to solidify the role of a market price support which will not be easy given the WTO commitments in external protection. It is likely that some room for manoeuvre will be provided by the future currency exchange rate development. To date, the association efforts of primary producers and the integration impulses on the part of the distribution network and processors have failed to play a more active role. Therefore, settling the issue of bad debts whose servicing depletes the primary production resources is of paramount importance.

CONCLUSION

In our opinion, an innovated agricultural policy concept that is expected to prepare the agricultural sector for the accession of Slovakia to the European Union will have to mobilize the resources available for a more efficient use in the key areas. The completion of the sector restructuring ought to be pivotal in these efforts. Hence, a prerequisite is an enhanced support of institutional framework, to facilitate the ownership rights enforcement, in both corporate management and the enforcement of the land owners' rights. Public spendings for making the ownership rights record-keeping and their transfers functional (owners' identification, functional operability of cadastral offices) and the acceleration of the commenced process of the land titles consolidation are to be among its priorities. An explicit support by means of the agricultural policy tools must be rendered to the ownership consolidation of production cooperatives which are the most common form of enterprise in agriculture. The forms of ownership consolidation are irrelevant, as their transformation to other legal forms of enterprise is easy to imagine; of relevance, however, is the pooling of the currently fragmented property participation in the registered capital of cooperatives in the hands of responsible owners able to fully enforce their ownership rights in corporate management.

Therefore, the Third Stage of agricultural policy should focus on the goals as follows:

- acceleration of the business sector restructuring;
- support of agriculture and processing industry modernisation, with an objective to enhance their competitiveness under the conditions of the globalizing economy;
- solidification of the marketing structures of agriculture and food industry and the involvement of primary producers (marketing associations) and the enforcement of various forms of market support using public funding;
- the introduction of an institutional framework to carry out the CAP interventions, the system of the direct payments distribution and control; a market surveillance system, and other administrative measures ensuring registration, testing and control of production and income.

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Arrived on 17th November 2000

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Problems of constructing Economic Accounts for Agriculture in the Czech Republic

Problémy sestavování Souhrnného zemědělského účtu v ČR

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Abstract: The article deals with the development of Economic Accounts for Agriculture (EAA) construction in Research Institute of Agricultural Economics. It categorizes the data sources and problems of their obtaining. It explains the methodic principles of EAA construction which has been published until now and the computation of the derived main indicators. Finally it briefly compares the results with the EU.

Key words: Economic Account for Agriculture, agricultural commodities, Agriculture effectiveness Indicators

Abstrakt: Článek pojednává o vývoji a problémech sestavování souhrnného zemědělského účtu ve VÚZE. Stručně rozebírá problémy se získáváním dat, jejich kategorizací a zdroje. Vysvětluje metodické principy tvorby dosud publikovaných ročníků souhrnných zemědělských účtů a výpočet základních indikátorů z něho odvozených. V závěru provádí stručné porovnání s EU.

Klíčová slova: souhrnný zemědělský účet, zemědělské komodity, indikátory efektivity zemědělství

INTRODUCTION

Economic Accounts for Agriculture (EAA) in the Czech Republic have been worked out by the Research Institute of Agricultural Economics (further VUZE), Prague, from the year 1994 with the methodological assistance of ASA Bonn. VUZE first in the CR translated into the Czech methodological documents of Eurostat as the obligatory manual for constructing EAA.

The basic principle of EAA is based on an approach where the agricultural branch is considered as a single national farm without respect to the real farm structure. This so-called *functional approach* defines the agriculture as a set of production branches. This methodic approach differs from that one used in the other branches of national economy, where the different, so called *institutional approach* is commonly used. This one is based on the sector definition as a set of enterprises (institutions) with their main activities corresponding to this sector. Tendencies to the unifying of national accounts for all branches of national economy caused the change of the EU methodology (expressed in the new Manual on the EAA/EAF 97 and obligatory for the EU countries from 1998) based on the modified institutional approach. According to this new approach, the agriculture is considered as a set of agricultural units which includes in principle all enterprises (Kind of Activity Units) which provide some agricultural activities and which are reduced only to these agricultural activities and to the other activities with these agricultural activities inseparably linked.

Constructing EAA in the CR by VUZE for the years 1994–1998 is based on the original functional approach (in accordance with the Manual on the EAA/EAF, 1987). But in 1999, the Czech Statistical Office (further CSU) in addition has for the first time construct the EAA for the year 1998 according to the above the mentioned new methodology.

This paper deals mainly with the VUZE approach and describes the Excel implementation of EAA obtained from the ASA-team (Boese, Angermueller, Kruse) in the framework of international cooperation and programs and modified by the VUZE team (Ratinger, Fischer, Foltyn, Zednickova) in the period 1994–1999 according to the needs and possibilities of the Czech agriculture and Czech information sources.

INFORMATION SOURCES AND FILLING EAA

Problem of filling EAA consists in confrontation of methodological requirements of the EAA (Figure 1) and their realisation on the base of available data sources. In principle, it can be said that it is necessary to search for some regions of the EAA data information in more different sources and to consider them with respect to the definitions of the EU methodology. This situation is further complicated by the non-compatibility of the Czech and EU information sources.

As sources of the required data for the EAA, we use 4 types of information sources in the following list of importance:

- direct statistical data (where the source is the CSO or other official statistic sources, e.g. branch statistics),
- expert data and estimates,
- the own computation of non-investigated data,
- computed, derived and final indicators in the Excel spreadsheet and the check mechanisms.

Direct statistical data

In this category, we range officially valid data every year published by the CSO or their preliminary officially estimated values if they are at a disposal and they are adequate to the EU methodology. To this category, we consider e.g. data about total amount of plant production according to individual commodities, number of heads of animals etc. With respect to the fact that the CSO has no detailed information concerning the structure of the animal production, it is necessary to use branch statistics of the Ministry of Agriculture and specialised commodity studies.

The next group is covered by the cost data (inputs of intermediate consumption and factor costs) which are derived from the investigation of test agricultural enterprises provided every year by VUZE. The data of agricultural inputs from the other sectors are available from Input - Output balances of the CSO, but they are not available each year and the time lag of publishing them is several years.

Expert and model data

There are many indicators in the EAA which are really unaccessible from the official sources. This deals with e.g. selfsupply of farmers with the own agricultural products, the data of it are contained in the experts' estimates with the background in the research works and studies or individual unofficial analyses and investigations. Further, the intrabranh consumption of seeds and feed is obtained from the experts' estimates or from the specialised mathematical models. Mathematical models serve as a source also in the case of structure of animal breeding when the corresponding data are not available or those available are not realistic enough.

Computations of the non-investigated data

The EAA as a global characteristic of all agricultural activities contains according to the EU methodology not only main agricultural products, but also commodities of even lower importance which are not contained in the official statistics or they are not complete. For these commodities there are the approaches used outgoing from the principle of similarity with the other commodities which are available.

For these commodities, the following rule is used: all input data are substituted by the average of similar commodities in relation to hectare or head of animals or unit of the final agricultural production. As soon as the orig-

inal information source is found, these algorithms will be substituted by these new original figures.

Computations of final indicators and check mechanisms

The EAA express a lot of indicators, which according to the some algorithms can be derived from the other data still, contained in the EAA. For these indicators there are used the mathematical principles of computation which are implemented in the spreadsheet. On the other hand, there are many indicators, which it is possible to compute the two different ways (with the theoretically same results). This fact is used for the different check and control tests, which indicate the correctness of EAA results.

The EAA in this sense provide back test of the correctness of the source EAA input data. This deals with computations of feed consumption for animal categories and parallelly the defined feeding part of the total production of plant commodities. The implementation of the theoretically correct algorithms is enabled by the Excel matrix structure of the EAA.

Calculation of the value added

Basic definitions

Final Agricultural Production (FAP in the sense of the Manual on EAA 1987): serves as a base for construction of the EAA. It is computed as a sum of final production of the individual commodities without intrabranh consumption and plus all changes between the beginning and ending stock of these commodities.

Intermediate Consumption (*IC*): is the sum of all necessary inputs for the agricultural production of the national farm (in the sense expressed above) without intrabranh consumption.

The following kinds of the value added serve then as the basic indicators for measuring of effectiveness of the agriculture and as a base for computing incomes of production factors incoming to its production process.

Gross Value Added at market prices (*GVAmP*):

$$GVAmP = FAP - IC,$$

where *IC* is the Intermediate Consumption.

Gross Value Added at factor costs (*GVAFc*):

$$GVAFc = GVAmP - TAX + SUB,$$

where *TAX* are all taxes and *SUB* are all subsidies linked with the agricultural production.

Net Value Added at Factor Costs (*NVAFc*):

$$NVAFc = GVAFc - DEP,$$

where *DEP* is depreciation.

Net Income from the Agriculture Activity of Total Labour (*NI*):

$$NI = NVAFc - REN - INT,$$

where *REN* are rents and *INT* are interests which are to be paid.

Indicator 1 – Net Value Added at factor costs on one employee in the agriculture (*IND1*):

$$IND1 = NVA_{fc}/AWU/INF,$$

where *AWU* is Annual Work Unit and *INF* is the global Inflation measured by the Consumer Price Index CPI.

Indicator 2 – Net Income from the Agriculture Activity per one Employee of total labour input in the agriculture (*IND2*):

$$IND2 = NI/AWU/INF,$$

where *AWU* is annual work unit and *INF* is the global inflation measured by the consumer price index CPI.

Share of the agriculture on *GDP* (*GDPagr*):

$$GDPagr = GV_{amp}/GDP,$$

where *GDP* is the gross domestic product (in the purchaser prices) of the Czech Republic

Explanation to computations

Final Production and intermediate Consumption are expressed in the part of production (production accounts) of EAA. The Gross Value Added is assigned as the difference between them.

Taxes on production: The main part of them are constituted by the property tax and motor vehicle tax. The next part is constituted by the tax compensations in the part of itemised subsidies to agrofood complex.

(Sources: CSO, financial statistics, and the data from the Ministry of Finance, CR, Ministry of Agriculture). Unfortunately they are at least one year delayed. Partial control can arise from the comparison with the rate of the taxes in the total final consumption – in CR about 1.5%, in EU 0.4–2.8%.

Subsidies: the calculation is done in accordance with the assign of subsidies in the agrofood complex (source Ministry of Agriculture).

Depreciation (Consumption of the Fixed Capital): The calculation is done in accordance with the data of the depreciation in the holdings having more than one hundred employees. The final calculation is done by widening of this value in proportion to the ratio of all employees in agriculture and the employees of the mentioned group of enterprises. The check of correctness is done by the results of the tested enterprises, by the items of the depreciation related to one hectare of the utilised agricultural land. The results are published in the "Green Reports" for the Czech agriculture. It is necessary in both cases to deduct the value of depreciation of the animals (it is assumed about 30% by the VÚZE estimations).

In the calculations, which were done until now, the data of the replacement prices of the fixed capital goods are missing. Unfortunately, these data are necessary for the correct calculation. CSO now prepares the basis for

them. These data will serve also in the next years for the Capital Account calculations.

Rents: The calculation is done in accordance with the received rents in the enterprises greater than 1000 ha and less than 1000 ha. The final calculation is carried out by the ratio of the total utilised agricultural area and the area of the two types of enterprises mentioned above. By the estimation of VÚZE, about 90% of land are rented.

Interest: The calculation is realised from the data of the Central Bank about the total credit granted to agriculture and the average interest rates.

Compensations of employees: This indicator is calculated as the product of volume of paid employees and the average agricultural wage, and widened in accordance with the rate of the social and health contributions and the wages.

LAST RESULTS FOR THE CZECH AGRICULTURE AND COMPARISONS WITH EU

Results of EAA for the Czech agriculture are presented with the time series from the year 1994 in the table 1. For the year 1998 there are also presented partial results of the CSO (only production part) according to the new EU methodology.

From the mentioned table we can see that the economic size of the Czech agriculture (share of the Value Added in market prices in GDP) permanently slightly decreases 2.8, 1.9, 1.8 per cent (for 1994, 1997, 1998, respectively) which is comparable with the EU situation, where this average rate was 1.6% for 1997 (e.g. Belgium 1.1%, Germany 0.8%, Austria 0.9%).

The worse result is revealed by the comparison of the basic structure of the Final Agricultural Production (*FAP*) inside the framework of which the Gross Value Added at market prices (*GV_{amp}*) is created, characterised by the indicator *GV_{amp}/FAP*. This share was in 1997 in the CR 28.9%, while in the EU about 50% (Germany 45.8%, Austria 46.5%, Netherlands 50.5% and Italy 71.9%). This indicates lower effects of inputs in the final production in the CR.

The similar situation is indicated by the share *GVA/IC*, where *IC* is Intermediate Consumption. This share reached in 1997 in the CR was only 40.7%, while in the EU 111% (Germany 84.4%, Austria 90.6%).

If we take into account also the subsidies in the EU countries which create part of Net Value Added at factor costs (*NVA_{fc}*), these comparisons are still worse for the CR. The *NVA_{fc}* create the income of production factors, i.e. labour, land and capital. The share *NVA_{fc}/FAP* was in the CR only 24.1%, while in the EU 52.1% (Germany 38.5%, Austria 45.5%).

If there is considered the basic indicator of productivity *NVA_{fc}/AWU*, i.e. the net Value Added at factor costs per one agricultural employee (*AWU*), then the comparison between the CR and the EU is much worse. This indicator demonstrates that in the CR there was created 3 236 ECU for one *AWU* (by the nominal exchange rate),

Tab. 1. Basic results of the Economic Accounts for Agriculture of the Czech Republik (mil. CZK)

Indicator	1994	1995	1996	1997	1998	1999
<i>Final agricultural output</i>						
Wheat	9,684	7,766	11,051	11,990	10,679	8,856
Rye	723	604	654	925	886	494
Barley	5,401	3,994	5,862	7,501	4,935	3,753
Oats	463	322	528	638	371	285
Maize	281	123	471	810	359	435
Other cereals	235	98	173	205	219	208
Cereals total	16,787	12,907	18,740	22,069	17,449	14,030
Pulses	395	431	419	341	454	284
Potatoes	3,927	7,502	6,639	4,326	6,929	3,245
Sugar beet	2,213	3,162	4,013	3,156	2,766	2,155
Root crops total	6,140	10,664	10,653	7,483	9,695	5,400
Rapes	2,456	3,629	3,092	3,656	4,719	4,979
Other oilseeds	1,009	1,158	852	825	1,549	1,716
Flax	101	144	68	21	39	70
Hops	1,389	1,452	1,446	890	606	847
Other industrial crops	310	477	684	561	406	170
Industrial crops total	5,265	6,860	6,142	5,952	7,319	7,782
Fresh vegetables	7,312	4,825	5,199	5,053	4,937	4,861
Fresh fruit	2,471	3,885	5,099	4,386	4,318	3,836
Grapes	593	415	941	533	699	719
Other crop products	916	290	198	220	167	245
FINAL CROP OUTPUT	39,879	40,279	47,390	46,036	45,038	37,157
Cattle (including calves)	8,196	10,233	11,105	10,416	9,756	7,611
Pigs	20,131	21,593	25,347	24,162	22,816	19,113
Poultry	4,049	3,993	4,208	5,092	6,656	6,213
Other animals	878	998	1,063	1,024	1,068	998
Animals total	33,255	36,817	41,723	40,695	40,296	33,935
Milk	16,706	18,102	19,795	18,259	20,328	18,535
Eggs	5,080	4,254	5,239	6,415	6,605	5,099
Other animals products	3	3	2	1	1	1
Animals products total	21,790	22,358	25,036	24,676	26,934	23,636
FINAL ANIMAL OUTPUT	55,045	59,175	66,759	65,370	67,230	57,571
FINAL AGRICULTURAL OUTPUT	94,923	99,454	114,149	111,407	112,269	94,728
<i>Intermediate consumption</i>						
Seeds and plants	3,241	3,008	3,221	3,596	3,602	2,911
Fertilizers and soil improvers	3,973	4,412	4,938	5,326	5,066	4,057
Plant protection products	3,074	3,392	4,113	4,210	4,587	4,441
Pharmaceutical products	718	311	343	314	548	462
Feedingstuffs	18,641	19,423	22,055	26,291	25,543	22,277
Other inputs	33,289	30,300	38,155	39,422	40,503	36,627
TOTAL INTERMEDIATE CONSUMPTION	62,936	60,846	72,825	79,159	79,849	70,775
<i>Global indicators</i>						
GROSS VALUE ADDED AT MARKET PRICES	31,987	38,608	41,324	32,248	32,420	23,953
Subsidies linked to production	2,255	4,631	6,167	7,070	8,979	10,418
Taxes linked to production	2,270	2,384	2,503	1,889	1,776	1,565
GROSS VALUE ADDED AT FACTOR COST	31,972	40,855	44,988	37,429	39,623	32,806
Depreciation	9,449	10,551	11,839	10,160	11,167	11,167
NET VALUE ADDED AT FACTOR COST (NVAfc)	22,523	30,304	33,149	27,269	28,456	21,640

Continuation of Table 1

Indicator	1994	1995	1996	1997	1998	1999
Labour costs total	21,971	21,412	23,853	25,758	27,055	25,573
Labour costs expressed in AWU	17,405	18,930	19,798	23,131	23,538	22,249
NET OPERATING SURPLUS	5,118	11,374	13,351	4,138	4,918	-609
Rent and other payments	1,600	1,374	1,557	1,600	1,402	1,400
Interest	4,509	5,038	4,878	5,094	2,997	2,856
NET INCOME FROM AGRICULTURAL ACTIVITY OF TOTAL LABOUR (NI)	16,414	23,892	26,714	20,575	24,057	17,384
Number of agricultural employees (persons)	246,549	221,620	217,208	213,738	204,189	190,800
Number of annual work units (AWU)	195,316	195,934	179,848	191,937	177,644	165,996
Indicator 1 = NVA_f/AWU/INF (in CZK/1 employee)	115,317	141,764	155,150	110,304	112,018	89,290
Indicator 2 = NI/AWU/INF (in CZK/1 employee)	84,039	111,769	125,032	83,227	94,701	71,729
Profit/loss	-991	4,962	6,916	-2,556	519	-4,865
GDP of the CR at market prices	1,148,600	1,381,100	1,572,300	1,668,800	1,798,300	1,836,300
Share of the agriculture in GDP at market prices (%)	2.8	2.8	2.6	1.9	1.8	1.3
Global inflation (INF) measured by CPI to the year 1994 (%)	100	109	119	129	143	146

Source: VUZE

while the average for EU was 16 441 ECU (Austria 11 793 ECU, Germany 19 108 ECU). Even if we take into account the difference in price levels and the difference in the level of subsidies, then we can deduce that the productivity in the Czech agriculture is much lower than in the EU (only about 50%). This situation is reflected by the structure of *NVA_f*. While in the CR the share of labour costs on the *NVA_f* creates 86.2%, in the EU only 23.6% (Germany 16%, Belgium only 8.9%).

In the Czech agriculture, we can see permanent decrease of the total labour forces which is also comparable with the situation in the EU. The share of employment in the agriculture in the total employment in the national economy create in the CR about 6% and in the EU about 5%.

In the table we can see in the last column value of the Final Agricultural Production computed according to the new methodology of the EAA. The comparison of the total FAP shows the important increase of this indicator according to the new approach (123 mio CZK against 112 mio CZK). This increase does not mean higher effectiveness of the Czech agriculture for it is caused by the

adding of the own feed into the FAP. On the other hand, the Intermediate Consumption will be higher about the same value. Then the consequence of these changes is that Gross Value Added (i.e. effectiveness) of the Czech agriculture will remain the same.

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Arrived on 28th November 2000

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Approaches to the solution of the quantification of the Agricultural and Food Policies concept implementation by the year 2005

Prístupy k riešeniu kvantifikácie uplatnenia koncepcie agrárnej a potravinovej politiky do roku 2005

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Abstract: The paper elaborates on a model solution of the Research Institute for Agriculture and Food Economics (RIAFAE), Bratislava, which served as a basic tool for testing the impacts of the Agriculture and Food Policy Concept of Slovakia by the Year 2005 and the impacts of the implementation of the EU Common Agricultural Policy on the agri-food sector in Slovakia. For the Concept needs, the basic RIAFAE APSM model was expanded by a simulation of the costs and income of agricultural production, coupled with the scale of agricultural production and support policies. In the quantification part of the paper, the solution focuses on the projections of the parameters of the intensity and extent of the production of major agri-food commodities, price and the price environment projections, support policy projections, and agriculture income projections.

Key words: the Concept, model, policy, agriculture, simulation

Abstrakt: Príspevok sa zaoberá modelovým riešením VÚEPP Bratislava, ktoré tvorilo základný nástroj testovania dôsledkov Koncepcie agrárnej a potravinovej politiky Slovenska do roku 2005 a dôsledky aplikácie Spoločnej poľnohospodárskej politiky EÚ na agropotravinársky sektor Slovenska. Základný model APSM VÚEPP bol pre účely Koncepcie rozšírený o simuláciu nákladov a príjmu odvetvia poľnohospodárskej výroby vo väzbe na rozsah poľnohospodárskej výroby a úroveň podpornej politiky. Riešenie je v kvantifikačnej časti orientované na výhľad vývoja parametrov intenzity a rozsahu produkcie hlavných agropotravinárskych komodít, výhľad vývoja cien a cenového prostredia, výhľad vývoja podpornej politiky a vývoj dôchodkovej úrovne poľnohospodárstva.

Kľúčové slová: koncepcia, model, politika, poľnohospodárstvo, simulácia

FOREWORD

In 1999 and 2000, three crucial documents related to the strategic issues of the future development of the agri-food sector in Slovakia were elaborated and presented for review. The documents tie into the Government Policy Statement, which in its agriculture section contains a statement about a market economy-based solution of the problems, which have been accompanying the transformation of this sector of the economy. The documents are as follows:

- The Analysis of the Development of Agriculture and Food Industry in the SR in 1990–1998,
- Agriculture and Food Industry Development Programme by the Year 2010,
- Agricultural and Food Policy Concept by the Year 2005.

From the sectoral point of view, pivotal role is played by the Agriculture and Food Industry Development Programme by the Year 2005, as it formulates a concept of the development of the production and economics of the agri-food sector long-term; it, too, considers the future accession of Slovakia to the European Union and the impacts of this change upon the agri-food development

in the country. The paper details the solutions applied in the simulation of the impacts of the enforcement of these conceptually vital documents on the Slovak agri-food sector.

DATA SOURCES AND METHODS

In drafting the background materials for the Agricultural and Food Policy Concept by the Year 2005 (hereafter, the Concept), analytical and synthetic, model, and simulation methodologies were applied. The solution to the starting position in agriculture and food industry is based on a synthesis of the findings contained in the paper The Analysis of the Development of Agriculture and Food Industry Between the Years 1990 and 1998. The externalities of a future development are a concentrated outcome of the analyses of foreign sources, the agri-food market projections, notably of the OECD, the EU Commission, the Economic Research Service of the US Department of Agriculture (ERS USDA), Food and Agriculture Policy Research Institute, Iowa University, USA (FAPRI), and the World Trade Organisation.

The macroeconomic conditions of the future development were based on several documents, namely, the Medium-Term Concept of the Socio-Economic Development of the SR, INFOSTAT (the Institute for Information Technologies and Statistics) projections, Bratislava, and the Institute for Forecasting of the Slovak Academy of Sciences.

The forecast of agriculture and food industry development was based on the documents quoted above. In addition, background commodity concepts and papers elaborated by professional research institutes and the Slovak Agriculture University (SAU) on the development of production and consumption of major agri-food commodities, envisaged changes in the intensity of the use of in-kind inputs in plant and animal production were also used. The SAU also collaborated on the drafting of the parts of background materials focusing on the business structure, R&D and consultancy development. After 1999, support policy, which underlied the meeting of the set goals, was closely linked with the quantification of the development capital need and the extent of subsidy support. The majority of the background materials mentioned above were an input to an econometric model solution of the development of the supply and demand balance of the major agri-food commodities (the RIAFE APSM model). Implicitly, this is also based on external competitiveness. For the Concept needs, the solution was expanded by a simulation of the income of agricultural production based on the projected in-kind and price

changes of the cost items of the individual commodities under modeling, production price swings, the scale of agricultural production, and the quality and impact of support policies.

In its quantification part, the projection of the agricultural sector development was focused on the:

- projections of the intensity and scale of production of the major agri-food commodities,
- price and the price environment projections,
- support policies projections,
- income projections (revenue and gross profit).

The output of the RIAFE APSM model is the balance of the major agri-food commodities including the production scale and intensity. The development of prices and the price environment as a model input were addressed in close correlation with the world price swings and the projections of the domestic market price support (MPS).

Profit figures are an outcome of the simulated production scale and prices, parameters of the in-kind consumption, of the variable costs of commodities and the input price projections, commodity fixed costs (depreciation of machinery, buildings, structures, overheads, rental, etc.) and labour costs derived from the changes in labour consumption and the real income development. The income level was simulated by adding production subsidies to the profit, whereby the subsidies were commodity-earmarked and disbursed depending on the scale of production, and income support were also factored in. Basic scheme of the model solution is represented in Figure 1.

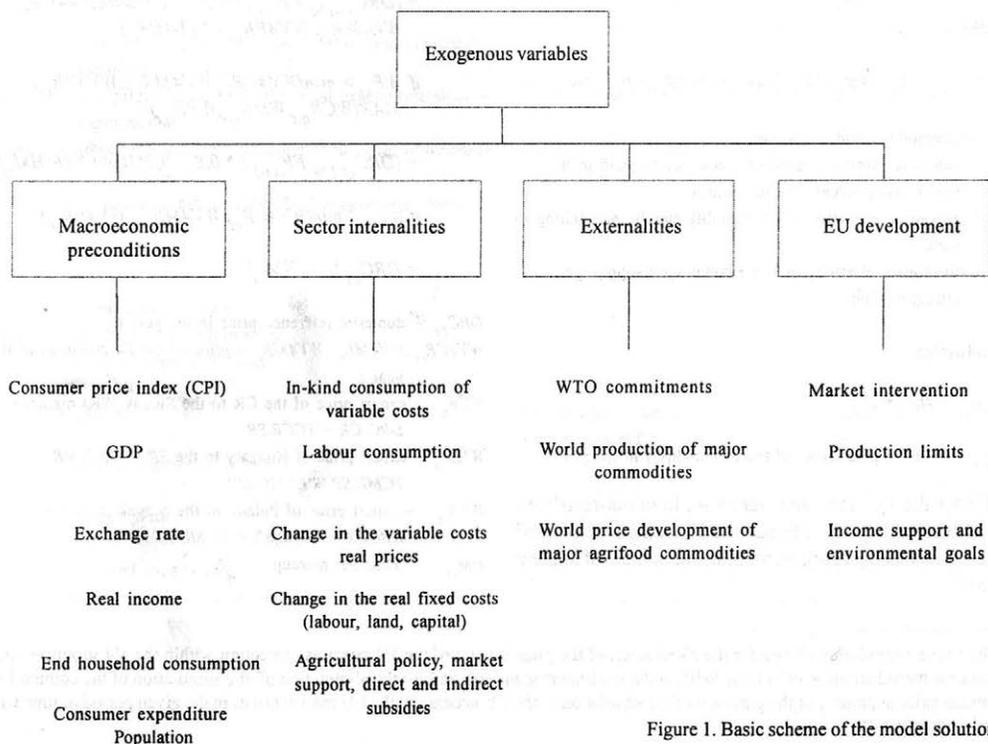


Figure 1. Basic scheme of the model solution

BASIC FUNCTIONAL DEPENDENCIES OF THE SUPPLY AND DEMAND MODEL

The model solution database is sequenced from 1989 to 1999, followed by the 2000–2010 projections. Among the commodities under modeling, there are: wheat, barley, rye, oats, maize for grain, rape (canola), sunflower, rape meal, sunflower meal, soya meal, rape-oil, sunflower oil, potatoes, sugar-beet, sugar, milk, butter, cheese, skimmed milk powder, eggs, beef, pork, and poultry meat.

Planted Areas

$$Ha_{i,t} = Ha_{i,t-1} * (FP_{iil}/FP_{ii,t})^{ehai} * (FP_{ikl}/FP_{ik,t})^{ehaik} \dots * (FP_{ijl}/FP_{ij,t})^{ehaij}$$

$Ha_{i,t}$ – area of the commodity i sown in the year t

$$Hz_{i,t} = Ha_{i,t} * K_{i,t}$$

$FP_{j,t}$ – farmer prices of the commodity j in the year t

$eha_{i,t}$ – own elasticity of i commodity supply, part falling to an area of land

$eha_{i,j}$ – cross elasticity of i to j commodity, part falling to an area of land,

$H_{z,t}$ – area harvested in the year t

$K_{i,t}$ – harvested/sown area ratio in the year t

Under the EU accession scenario, in crops impacted by the CAP, the planted area is limited by the percentage of the set-aside within the time horizon concerned.

Yield

$$Y_{i,t} = Y_{i,t-1} * K_{i,t} * (FP_{1,t}/FP_{1,t-1})^{ey_{i,1}} \dots * (FP_{n,t}/FP_{n,t-1})^{ey_{i,n}}$$

$Y_{i,t}$ – commodity yield in the year t

$K_{i,t}$ – intensity growth or drop of a commodity yield in the year t , independent of price swings

$ey_{i,t}$ – own price elasticity of i commodity supply, part falling to yield

$ey_{i,j}$ – cross price elasticity of i to j commodity supply, part falling to yield

Production

$$Q_{s,i,t} = Ha_{i,t} * Y_{i,t}$$

$Q_{s,i,t}$ – domestic production of the commodity i in the year t

Under the EU accession scenario, in quota-restricted commodities, a quota is fixed based on which the planted area is calculated (sugar), or, for milk, the number of milking cows.

Number of Livestock

The number of beef cattle is derived from the share of the individual livestock categories depending on the number of milk cows and the projections of efficiency parameters. The number of milk cows is a result of milk production.

$$Y_{m,t} = Y_{m,t-1} * K_p * (FP_{1,t}/FP_{1,t-1})^{e_{i,1}} \dots * (FP_{n,t}/FP_{n,t-1})^{e_{i,n}}$$

$Y_{m,t}$ – milk production in the year t

$e_{i,t}$ – own price elasticity of i commodity supply

$e_{i,j}$ – cross price elasticity of the commodity i and j supply

$$S_{d,t} = Y_{m,t} / D_t$$

$S_{d,t}$ – number of milk cows in the year t

D_t – milk yield in the year t

The number of cows with no market milk production are an exogenous projection and the livestock number and meat production are derived from the herd turnover in the said category.

Sow numbers are derived from the pork meat production coupled with the breed efficiency parameters.

The production of poultry and eggs is simulated by a production function, as in milk production.

Prices¹

$$FP_{i,t} = WP_{i,t} * (1 + MPS_{i,t}), \text{ or} \\ = (DRC_{i,t-1} \vee FP_{i,t-1}) * 0,8 + 0,2 * \min(WV4CR_{i,t}, WV4MR_{i,t}, WV4PR_{i,t}) * (1 - HM_{i,t})$$

$$\text{if } WP_{i,t} > \min(WV4CR_{i,t}, WV4MR_{i,t}, WV4PR_{i,t}) > \text{MAX}(WCR_{ij,t}, WMR_{ij,t}, WPR_{ij,t})$$

$$= (DRC_{i,t-1} \vee FP_{i,t-1}) * 0,8 + 0,2 * Wpi,t * (1 - HM_{i,t})$$

$$\text{if } WP_{i,t} < \min(WV4CR_{i,t}, WV4MR_{i,t}, WV4PR_{i,t})$$

$$= DRC_{i,t} * (1 - HM_{i,t})$$

$DRC_{i,t}$ – domestic reference price in the year t

$WV4CR_{i,t}, WV4MR_{i,t}, WV4PR_{i,t}$ – price of the V4 countries in the year t

$WCR_{i,t}$ – export price of the CR to the Slovak (SR) market = $DRC_{i,t} + TC_{i,t}$

$WMR_{i,t}$ – export price of Hungary to the SR = $DRC_{i,t} + TC_{i,t} + IT_{i,t}$

$WPR_{i,t}$ – export price of Poland to the Slovak market = $DRC_{i,t} + TC_{i,t} + IT_{i,t}$

$HM_{i,t}$ – DRC-FP markup

¹ The above formulation allows for the elimination of the price impact of the V4 customs protection within the V4 group; it, too, allows for the substitution of WP for WIP (under the import scenario), and for the elimination of the stimulation of the commodity domestic price support. For the purposes of the simulation of the EU accession, the EU market prices in the given period of time will apply automatically.

$MPS_{i,t}$ – level of the SR market support of i commodities

$WP_{i,t}$ – world price of the commodity i

$$WIP_{i,t} = WP_{i,t} + IT_{i,t} + TC_{i,t}$$

$WIP_{i,t}$ – import price of the commodity i

$IT_{i,t}$ – duty on the commodity i

$TC_{i,t}$ – costs of transportation of the commodity i to the SR

Food Industry Use

$$Qd_{i,t} = Qd_{i,t-1} * (FP_{1,t}/FP_{1,t-1})^{ed_{i,1}} * \dots * (FP_{n,t}/FP_{n,t-1})^{ed_{i,n}} * (I_t/I_{t-1})^{el_{i,i}} * P_t$$

$Qd_{i,t}$ – use of the commodity i in food industry

$ed_{i,1}$ – own price elasticity of i commodity demand

$ed_{i,j}$ – cross price elasticity of i to j commodity demand

$el_{i,i}$ – income elasticity of i commodity

I_t – real income per capita in the year t

P_t – population in the year t

$$RP_{i,t} = DRC_{i,t} * (1 + SR)$$

$RP_{i,t}$ – retail price of i commodity in the year t

SR – consumer spread

Food Expenditure

$$Wdos_{i,t} = Wdos_{i,t-1} * (RP_{i,t}/RP_{i,t-1})^{edos_{i,i}} * (RP_{j,t}/RP_{j,t-1})^{edos_{i,j}} * (I_t/I_{t-1})^{edosI}$$

$Wdos_{i,t}$ – other food expenditure share of the total consumer spending in the year t

$edos_{i,i}$ – own price elasticity of other food expenditure share to i commodity

$edos_{i,j}$ – cross price elasticity of other food expenditure share to j commodity

$edosI$ – income elasticity of other food expenditure share

$$Wp = Wmp + Wdos$$

Wp – food expenditure share

Wmp – model food expenditure share

$Wdos$ – other food expenditure share

$$Emp = Qd * RP$$

Emp – model food expenditure

$$Edos = Esp * Wdos$$

$Edos$ – other food expenditure

Esp – consumer expenditure (exogenous)

Import and Export

$$Import = Q_i + (Q_S + Q_{PZ} - Qd_d - Q_{KZ}), \text{ if } (Q_S + Q_{PZ} - Qd_d$$

$$- Q_{KZ} + Q_i) < 0,$$

$$Q_i, \text{ if } (Q_S + Q_{PZ} - Qd_d - Q_{KZ} + Q_i) \geq 0,$$

Q_{PZ} – beginning inventory

Q_{KZ} – ending inventory

Q_i – minimum market access

$$Export = Q_d - Q_{KZ}$$

Export is a theoretical exportable quantity and not a quantity effectively marketable in foreign markets. Marketable export may be derived by analyzing all the price environments and barriers compared to the SR export prices and exportable surplus.

Ending inventory is derived from a previous three-year average of the domestic consumption percentage share, or directly defined, in some commodities, as a result of surplus (e.g. potatoes). In the case of the accession of the Czech Republic, Hungary, and Poland to the EU, EU export conditions in accordance with the Agenda 2000 are automatically simulated in the model and applied to the commodities under modeling and their impact upon the Slovak market.

Feed Consumption

$$Q_{ks,t} = Q_{ks,t-1} * (FP_{i,t}/FP_{i,t-1})^{ek_{i,i}} * (FP_{j,t}/FP_{j,t-1})^{eh_{ij}} * LVU_t$$

$Q_{ks,t}$ – feed consumption in the year t

LVU_t – total number of Livestock Units calculated from the herd turnover in the year t dependent on the supply and demand development in individual commodities of animal products

$ek_{i,i}$ – own price elasticity of i feed demand

ek_{ij} – cross price elasticity of i to j feed demand

Total Demand

$$Q_{dd} = Q_d + Q_{ks} + Q_o + Q_{os}$$

Q_{dd} – total domestic demand

Q_o – use for seed

Q_{os} – other use

VARIABLE AND FIXED COSTS OF THE COMMODITIES UNDER MODELING

Expert estimates (up to the present) are exogenous variables coupled with the intensity of the: a) development of the changes in in-kind consumption of seeds, fertilizers, pesticides, seed and fertilizer production and consumption, consumption of feed, fuels, utilities, labour, other materials, depreciation of machinery and buildings, and overheads per unit of production of the individual commodities under modeling and, b) the development of the real price changes in individual cost items.

The sum of costs is a product of the final commodity-modeled production, prices and in-kind consumption of production factors.

$$N1_i = \sum_{k=1}^m Q_{si} * (N_{ik} * P_{v_k})$$

$$N2_i = \sum_{k=1}^m Q_{si} * (N_{ik} * P_{f_k})$$

$$N = \sum_{i=1}^n N1_i + N2_i$$

$N1_i$ – variable costs of i commodity

$N2_i$ – fixed and working costs of i commodity

N_{ik} – in-kind consumption of variable costs

N_{ik} – unit consumption of fixed costs, or, hourly labour consumption

P_{v_k} – price of variable cost item

P_{f_k} – price of fixed cost item

N – total costs of all commodities

Sales amount (T) is a product of prices and scale of production.

$$T = \sum_{i=1}^n Q_{si} * FP_i$$

Value added (PH) is a difference between sales and variable costs.

$$PH = T - \sum_{i=1}^n N1_i$$

Gross profit (HZ) is a result of a difference between value added and working and fixed costs of the modeled scale of production.

$$HZ = PH - \sum_{k=1}^m N2_i$$

Profit (Z) is a sum of gross profit and product of support per unit of production and scale of production.

$$Z = HZ + D_{pp}$$

$$D_{pp} = \sum_{i=1}^n Q_{si} * D_{pp,i}$$

$D_{pp,i}$ – subsidies for production support of i commodity

D_{pp} – subsidies for production support total

Total agriculture income is a sum of profit and income support.

$$CP = Z + DP$$

DP – income support

CP – total income

RESULTS AND DISCUSSION

The simulations were conducted under several scenarios:

a) the basic scenario with progressive trends of the sector preparation for the EU accession by the adaptation to world prices, use of development intensity trends, however, without the application of the EU CAP instruments;

b) scenario under which the EU CAP instruments were applied within the scope of the Agenda 2000 (prices, interventions, production limits, compensations, environment payments) with the effects of the EU prices nearing the world prices in the wording of the Agenda 2000;

Scenario b) was applied in the Agriculture and Food Development Programme by the Year 2010, for the country's EU accession in 2003. It was found that the level of intensity, efficiency and production in 2002, i.e. prior to the EU accession, was generally low. A new support policy of the SR and the pre-accession strategy are unlikely to deliver tangible results in such a short period of time (2 years) that would make the agricultural and food sector ready for a highly competitive EU environment. For example, this also concerns a low attainable quota level. Presumably, an outcome would be an increase in the import of some food commodities.

Judging by the simulated results, the application of the Concept tools and goals by the year 2005, and subsequently after the EU accession, is the precondition of a marked increase in the production efficiency, competitiveness, and the scale of production. In the pre-accession period, generated profit (dramatic loss reduction), coupled with income support, would establish conditions for the production intensification and restructuring and an indispensable technological rehabilitation. These results will also be manifested in food industry which, considering the current state of the majority of Slovak enterprises, is unlikely to survive under the EU conditions.

Using the model, the following risk scenarios of the Concept were tested:

SQ Scenario, or the status quo scenario, which entails the maintenance of the current nominal support level, i.e. effectively, its drop. The disparity between the domestic prices and world prices of commodities, which existed in 1999, would continue.

IC Scenario, under which domestic prices are derived from the world import prices (world price + world market transportation costs + duty). The existing disparity between the domestic and world import prices of commodities would be gradually reduced by 2005. Even in nominal terms, the support would maintain the year 2000 support level, and production stimulation would be only contingent on the swings in these prices (low support level will not stimulate production).

SC Scenario – under this Scenario, domestic prices are equivalent to the world import prices (world price + world market transportation costs + duty). Support mechanism would be eliminated, and production stimulation would only be contingent on the swings in these prices (support mechanism elimination).

The simulation of the above scenarios of agricultural policy with a varying degree of liberalisation (starting with keeping the support mechanism at the year 2000 level down to its elimination) indicated, as distinct from the proposed Concept, a dramatic deterioration of the future agriculture and food industry economic indicators. Save for the SC Scenario, it would be trade benefiting from this deterioration.

CONCLUSION

Among the most sensitive parts of the solution with a high risk rate is:

- a) price development derived from the national support and world prices development
- b) development of the in-kind consumption of inputs
- c) input price development
- d) the support policy development and orientation.

For the above reasons, and assisted by RIAFE Prague, there is under way a model of partial market equilibrium across a whole range of food commodities, with options of various specific functions and scenario policies. Some

initial findings have been transposed into the Concept, notably, the effect of the Concept upon the food industry and trade. It is believed that the present solution has met the goals stipulated in conjunction with drafting of the Agriculture and Food Industry Development Programme by the Year 2010 and the Agriculture and Food Policy Concept. Its strength is to be seen in the simulation of the magnitude of changes across a wide range of time-sequenced indicators.

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Arrived on 17th November 2000

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EU membership – problems and risks for the Czech agrarian sector

Problémy (rizika) agrárního sektoru ČR při vstupu do EU

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Abstract: Since 1994, within the grant project, the writers of the paper cover in their research work the solution to topical tasks in the Czech agricultural sector. They also analyse its development. In March 2000 the analysis of the completion of task is specified in the document no. 107/10/34/6999/0, the conception of Czech agricultural policy with regard to the requirements raised by EU. The summary of the results and opinions concerning the aims of agricultural policy in the CR and their solution form the content of this paper. EU entry is a long-term task for the CR, introducing a great number of changes in the sphere of legislation and budget levelling of the CR to the Common Agricultural Policy of the EU. The writers also evaluate the preparation of the agricultural section for EU entry and anticipate changes after entry. On 6 June 2000, negotiation between the CR and EU on "Agriculture" was started with the aim to specify the terms of the Czech Republic's entry into the European Union. Benefits of quick EU entry for the Czech Republic: a) extension of agrarian products market – to sell the products for higher prices; b) improvement of protection of our agricultural original producers and the Czech agrarian market; c) to gain multiplied subsidies for the development of rural regions. Possible sale of cheap agricultural land in the Czech Republic to the economically stronger EU members will become a serious risk. On the other hand, the neighbouring EU members are afraid of the cheap labour force coming from the CR (upon EU entry). The principles of agricultural policy of the present Czech government comply with the interests of the CR to join the EU and are listed both in the programme declaration of the Government and the above named document "Conception of agricultural policy of the CR from the aspects of EU requirements" approved by the Government in 1999. However, they were adopted without state budget funding. Entry to the Union will not be possible unless they are implemented.

Key words: agrarian policy, preparation for admission to the EU, problems of agriculture in CR, the negotiations with the EU, the economic impacts

Abstrakt: Autoři se ve své výzkumné práci zabývají v rámci grantových projektů od roku 1994 možnostmi řešení aktuálních úkolů agrárního sektoru ČR a rozbořem příčin jeho vývoje. V březnu roku 2000 předložili zprávu k řešení vnitřního grantového projektu ČZU v Praze č. 107/10/34/6999/0: Analýza plnění úkolů ČR, definovaných v dokumentu Koncepce agrární politiky ČR z hlediska požadavků EU. Souhrn výsledků a názorů na cíle zemědělské politiky ČR a jejich řešení je obsahem tohoto příspěvku. Dlouhodobým cílem ČR je vstup do Evropské unie, který pro resort zemědělství přináší velké množství úkolů v oblasti legislativního i rozpočtového přiblížení ke Společné zemědělské politice EU. Autoři rovněž hodnotí přípravu agrárního sektoru na vstup ČR do Evropské unie a očekávané změny po přijetí ČR do EU. V Bruselu bylo 6. 6. 2000 zahájeno jednání ČR s EU o kapitole „Zemědělství“, které bude definovat pro tento resort ČR podmínky pro přijetí do Evropské unie. Ke prospěchu zájmu ČR o rychlý vstup do EU lze uvést: a) možnost rozšíření trhu s agrárními produkty za vyšší ceny; b) zlepšení ochrany našich zemědělských prvovýrobů i vnitřního agrárního trhu ČR; c) možnost získat násobně vyšší dotace na rozvoj venkovských regionů. Závažným rizikem bude možnost odprodeje levné zemědělské půdy v ČR ekonomicky silnějším subjektům z EU. Oproti tomu sousední státy z EU mají obavu z přílivu levnějších pracovních sil z ČR (po přijetí do EU). Zásady zemědělské politiky současné vlády ČR jsou v souladu se zájmy ČR o začlenění do EU obsaženy jak v programovém prohlášení vlády, tak v podrobně rozpracovaném a vládou v roce 1999 přijatém dokumentu „Koncepce agrární politiky ČR z hlediska požadavků EU“. Byly však přijaty bez zabezpečení ze státního rozpočtu. Bez jejich realizace bude přijetí ČR do EU málo reálné.

Klíčová slova: zemědělská politika, příprava vstupu do EU, problémy zemědělství ČR, jednání s EU, ekonomické dopady

INTRODUCTION

In the programme declaration of the Czech government (and in the election programme of the CSSD as well) reasonable attention is given to agriculture and its target definition i.e. to adapt the Czech agriculture to the standards of the Common Agricultural Policy of the EU in-

cluding effective market regulation as fundamental instrument of food price stabilisation both for the consumers and primary products and the ways of supporting of these targets.

The document adopted by the government provides analysis of the Czech agricultural policy targets in the period before the EU entry including the time schedule,

different solutions and the funding of target implementation: The document is called the Conception of Agricultural Policy of the CR for the period following the year 1999 which identifies four pillars of agricultural policy:

- A – Market regulation and income support
- B – Environmental measures (complete care for soil)
- C – Refurbishment and transformation of companies (development of market structure)
- D – Services and institutions in compliance with the EU

In terms of time and contents, the implementation the above "pillars" are segmented as follows: "Revitalisation" (2000–2001), "Adjustment" to the EU system (from 2002). The estimate of the minimum budget according to the Czech proposal accounts for 23.6 bln. per year and according to EU proposal, 40.7 bln. CZK per year. Present level (14.2 bln. CZK) will be reduced significantly in 2001 by the Ministry of Agriculture department. The Minister of Agriculture prepared and reasoned his requirement on the increase of the Ministry of Agriculture budget in 2001 (by approx. 4 bln. CZK, as opposed to 2000). Considering the Czech budget situation the draft budget approved in "the first reading in the Czech Parliament" will be 3.1 bln. CZK lower. Budget limits obviously indicate (besides further objective terms) the implementation of the Conception of agricultural policy. This might also result in the postponement of the date of EU entry.

The negotiation of the CR regarding EU entry and the opening of the Chapter of Agriculture has entered its crucial stage in June, 2000. The negotiation of the terms of the Czech entry into the EU and particularly the terms set out for the agricultural department in terms of fixing the production quotas (i.e. the scale of Czech agriculture) and in other spheres as well, will be a difficult and lengthy process. This concerns the sale of cheap Czech land to the economically stronger EU members and the EU countries fears about the influx of cheaper labour from the CR (according to the EU principles about the free movement of capital and labour). The budget incomes of the CR so far do not allow to apply the EU provision no. 1257 "Support of rural development" about the increase of subsidies primarily for agriculture (and its non-production functions).

In the term for the CR the advantages of EU entry should prevail over the disadvantages. It is in the economic and political interest of the CR to negotiate acceptable conditions for the EU entry soon while the nearest term (2004) is obviously unreal.

The decrease in the average prices of the primary agricultural producers was by 11,7% (as opposed to the previous year, meaning that in terms of revenue the decrease was 11 bln. CZK). Extreme droughts in 2000 (at the end of spring) locally reduced the expected crop harvest by 7 bln. CZK, causing further worsening of the economic status of agricultural primary producers in the CR.

In order to compensate for the consequences of droughts, the CR will issue bonds accounting for 5 bln. CZK (similar compensation has been provided to the producers in the Slovakia).

DISCUSSION

In part 4.2.4. "Agriculture" of programme declaration of the Czech government, two sphere of tasks are listed which are only partly being fulfilled, or not at all. The Declaration reads "The fundamental programme task of the Czech government in agriculture is to end the decreasing of scale and economic impact and to prevent further devastation of rural space. The government will, in compliance with regional development programmes, create conditions for the improvement of the level and scale of quality agricultural production, first, the production sphere. On the other side, it will support the environmental stability, settlement and function of the rural sphere in non-advantageous terms".

It is obvious that a considerable part of the implementation of these tasks depends on the increase of Czech economic efficiency as a whole and the related improvement of the budget supporting the above tasks. It should be noted that the subsidies for land management in mountain and sub-mountain areas are reserved corresponding to budget possibilities and the basic fulfilment of this aim.

The programme declaration, inter alia, says: "The conception of the agricultural policy will also entail the increased efficiency and the range of subsidies and support serving as off-price instrument of covering the multi-function of agricultural, food prices stabilisation and maintenance of the incomes of agricultural workers. In the process of levelling the terms with the EU, the adoption of so called "green oil" will be proposed.

According to the above-mentioned declaration, in the last two years the non-inflation development of food-prices was maintained (obviously due to the fall of agricultural product prices in 1999). In 2000, the newly adopted amendment on the return of part of the oil tax to the agricultural producers (green oil) became efficient. This amendment is subject to vast criticism of smaller producers as it is very complex and difficult in terms of administration – due to this they do not often use the instrument for cutting the production costs. The aim to maintain the incomes of agricultural workers on a level comparable to other sectors has failed. In 1999/2000, the average income in the CR continued to fall below 75%. This causes further outflow of the most skilled workers from agricultural primary production (including managers). These problems relate to the results of internal grant project structure of J. Palán at the Czech Agricultural University in Prague (no. 104/10/21197) which, on the basis of 5 representative case studies, mentioned the top management in the field of agriculture. It is evident that available databases of information are not used effectively and market research is not systematic. The service provided to key customers is not perfect. Proper orientation in problems of food-supply chains is missing. Knowledge and skills in the sphere of foreign trade are also lacking (see *Zemědělská ekonomika*, 46, 2000 (6), p. 255–256).

Besides the lower protection of the food market in the CR in terms of duties, subsidised exports of superfluous products (i.e. in comparison with the EU) and the above mentioned results of the survey, weaken the position of agricultural primary producers in the market and deepen the increasing deficit of our foreign agricultural trade.

With regard to the loss-making agricultural primary production in the CR (growing since 1991), the ability to compete in this field before the EU entry is becoming weaker. After joining the EU, a lower intensity of plant production (per hectare yields of potatoes, wheat, sugar beet and other crops) will become another factor. This increases the share of fixed costs per product. In the CR, the quality of the final treatment of consumer products is often lower (as opposed to the EU). However, there are also positive aspects of Czech agriculture competitiveness, which was published by the authors earlier (Bra-beneč, Šafecová 1998).

The position of the Czech agriculture in the EU will depend greatly on the scale of production in the sector which will be negotiated by the Czech teams for EU entry.

Foreign trade balance of the agricultural sector

The development of the Czech foreign trade balance is a relatively reliable criterion for lower protection of our home market on one side and low active support of exports on the other. The fundamental data about the foreign trade balance of agricultural production is listed in Table 1.

In 1991, agricultural exports of the CR exceeded the volume of agricultural imports (positive balance 2.1 bln. CZK). In this particular year, after price liberalisation and removal of the second part of the negative VA tax imposed on food prices in the CSFR, it was necessary to increase the export of agricultural products to compensate for the fall of purchase power by almost 1/3. This was obviously the last period when our export of agricultural commodities was not "handicapped" by additionally adopted commitments within the GATT, implemented from 1 January 1996 by WTO (World Trade Organisation), as opposed to EU member-states. The range of discriminating measures is due to a different level of customs rates existing when the contracts were signed. These are derived from a different level of average prices for poultry meat (i.e.: chickens, ducks, turkeys and their parts). Our average export prices per kg were

50%–100% higher in 1997–98 than the prices of the same imported commodities.

Table 1 suggests that in 1995–1999 the volume of agricultural exports of the CR has in fact stagnated at the level 30–35 bln. CZK per year, but agricultural imports have increased by 10 bln. CZK. The negative balance of foreign agricultural trade almost doubled from 12 up to CZK 23.8 bln. This trend resulted in the development of liabilities of the agricultural trade share in the general trade deficit of the CR. The above mentioned share increased in 1995 from 12.58 % up to more than 34% in 1999. The decisive share in the negative balance of agricultural foreign trade of the CR comes from trade with the EU states from which we import voluminous commodities produced (or producible) in this country of comparable quality. This applies to potato starch, apples, and food for dogs and cats, sugar and others, which usually do not enrich the choice in our food market. By joining the EU the results for significantly different conditions for our agricultural foreign trade would be eliminated in the common EU market. The problem would lie with the ability to compete of our producers and manufacturers of agricultural commodities.

According to the OECD method, the total production of agricultural primary production the CR (expressed in prices set up by agricultural manufacturers in 1998) was 129 bln. CZK. In 1999 (when the fall of agricultural product prices was more than 11%) it was. CZK 119 bln. Although agricultural imports and exports often represent, in terms of price, many times the value of those of primary production, they constitute a considerable part of the total production (see Table 1 in 1999 – imports – 57.8 bln. CZK, exports CZK 34 bln)..

The expected consequences of the unified economic strategies of the EU

The strengthening of the economic power and stability of 15 EU member states is based on 3 main principles:

- 1) Unified market (including duty-free movement of the goods and services)
- 2) Free movement of the capital
- 3) Free movement of labour

Most of the member countries have adopted the new forth principle – the introduction of the unified EURO currency.

Table 1. The development of agricultural foreign trade of the Czech Republic and its balance in bln. CZK

Year	1995	1996	1997	1998	1999
Agricultural export	35.6	29.1	32.2	33.7	34.0
Agricultural import	47.6	51.0	55.6	55.8	57.8
Agricultural trade balance	-12.0	-21.9	-23.4	-22.1	-23.8
Share of agriculture export in total Czech import (%)	6.19	4.90	4.46	3.97	3.66
Share of agricultural import in total Czech import (%)	7.11	6.78	6.45	6.01	5.79
Share of agricultural trade negative balance in % in total commercial deficit of the CR	12.58	13.88	16.78	28.08	34.17

Source: Report on the Czech Agriculture in 1999

The last three EU member countries admitted the need to adjust to the unified economic strategy in the sphere of agriculture (regardless of the different conditions of Austria or Finland).

The CR does not pay a great attention to the preparation for unified economic strategy of the EU despite the declared interest of the CR in the EU entry in the first wave.

Within the unified market, it is necessary to secure unity for quality and product marking. This will entail technological modernisation of our food processing industry, which is not feasible without foreign capital investment.

The free movement of the capital can contribute, for example, to the further modernisation of our food industry after the Czech admission to the EU. At the same time it represents the most serious threat to agricultural primary production in the CR where the current price of agricultural (as well as non-agricultural) land is at least ten times lower than in the neighbouring EU countries. In the Czech Republic agricultural production is carried out on land leased from smaller owners (farmers). For the economically stronger EU countries it would be profitable to invest free capital into the "purchase of land in the CR". The new owner would naturally decide on whether this land will be used as agricultural land or if another use is preferred. The Polish government, at preliminary negotiation regarding entry, wants to solve this problem by having a long "transitional period". The CR has not so far specified its requirements.

The principle of free movement of labour in the EU countries enables anyone to settle or work in any member country. The implementation of these principles (neighbouring EU member countries, especially Austria protect themselves during the transitional period) might have a greater impact on the CR after its EU entry than is generally expected. It cannot be ruled out that much higher wages in Germany and Austria comparing with the CR will create a strong drive for job seeking not only in the case of highly skilled experts from CR abroad, but a similar interest will be shown by craftsmen or other professionals (or seasonal labour). Due to these developments, a brand new situation might appear in the Czech labour market. It should be properly considered how the forthcoming situation could be solved.

CONCLUSIONS

The implementation of the agricultural policy tasks in terms of compatibility with the unified agricultural policy of the EU is very difficult without reasonable funding

Important first steps towards the compatibility of the Czech and the EU agricultural policy were the adoption

of the Act No. 252 on Agriculture in September 1997 and the approval of the document: The Conception of Agricultural Policy in the CR for the period before EU entry by the Czech government in 1999.

In 1999–2000, the preparation and approval of Czech legislation on agriculture, compatible with the effective legislation in the EU was sped up

In 1999–2000, the volume of funds for agriculture and maintenance of rural region were increased. The proposed cuts of the budget for the Ministry of Agriculture in 2001 will result in the delayed implementation of the principles outlined in the Conception of Agricultural Policy (with regard to approaching the EU).

The competitiveness in agricultural primary products for the CR as opposed to the EU has been decreasing since 1991 due to loss-making developments in the whole agricultural field. The improvement of legislative conditions for price stability and the sale of agricultural products would create an environment to restore the competitiveness.

Current Czech state budget receipts do not allow for the "support and development of rural areas in the CR" on the scale currently applied in EU countries. It is obvious that the above funds would not allow the CR to contribute to the Common Agricultural policy of the EU on a level acceptable to member countries.

Without EU entry, the CR does not have a real prospect to improve its very unfavourable foreign-trade agricultural balance.

EU entry could create real conditions for the majority of our primary agricultural producers to restore their competitiveness against the range of agricultural primary producers in the EU and thus to stabilise its business environment.

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Arrived on 8th November 2000

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The Likely Effect of the WTO Negotiations Upon the SR Agri-food Trade

Pravdepodobný vplyv rokovaní WTO na agropotravinársky obchod SR

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Abstract: The current situation alludes to the continuing efforts towards the world trade liberalisation. It is likely that this trend will be advocated in the current negotiation round of the World Trade Organisation, of which the Slovak Republic is also a member. A comparatively low average tariff level applied in the Slovak agri-food import calls for a better knowledge of the level to which it will be practicable to reduce the currently applicable tariffs while ensuring at least a minimum protection of domestic producers.

Key words: commodity, "sensitive item", import, duty, tariff quota, customs union, price, the WTO

Abstrakt: Aktuálna situácia naznačuje pokračovanie snáh o ďalšiu liberalizáciu svetového obchodu. Táto tendencia sa pravdepodobne bude presadzovať v prebiehajúcom kole rokovaní WTO, ktorej členom je aj Slovenská republika. Pomerne nízka priemerná úroveň colných sadzieb uplatňovaných v slovenskom agropotravinárskom dovoze vyžaduje poznať úroveň na ktorú bude možné znížiť v súčasnosti platné colné sadzby a pritom zabezpečiť aspoň nevyhnutnú ochranu domácich producentov.

Kľúčové slová: komodita, „citlivá položka“, dovoz, clo, colná kvóta, colná únia, cena, WTO

FOREWORD

A new round of the WTO multilateral negotiations opened at the 3rd Conference of Ministers in Seattle, in late 1999, gravitates towards further liberalisation of the world trade. The overriding priorities of these negotiations are agriculture and services.

Market access is among the vital areas to be addressed during the negotiations on agriculture. By accessing to the WTO, the Slovak Republic has undertaken to reduce tariffs of agri-food commodities during the transitional period (between the years 1995 and 2000), by 36 per cent on the average, and no less than 15 per cent. In addition, in 24 most sensitive agri-food commodities to which countervailing duties were applied, due to the elimination of non-tariff barriers, tariffication was applied, i.e. countervailing duties were factored in the duty amount. In the Uruguay Round GATT Agreement negotiations, the Slovak delegation succeeded to negotiate a concession that during the transitional period, the duty on wheat flour, apples, apple juice, malt not roasted, and hop cones need not be reduced.

In the 24 commodities mentioned above, in case of preferential duty, minimum or current market access was set in the form of tariff quota (the so-called GATT quota). Minimum market access was defined as 3 per cent share of import in domestic consumption, and during the transitional period, this share was regularly raised up to a level of the current market access, defined as 5 per cent

share and over of import in domestic consumption. In addition to the GATT quotas, bound, or, preferential duty is applied in accordance with the applicable free trade agreements. Bound and preferential tariffs and also market access quotas are enshrined in the Schedule of Commitments of each member.

Tariff quotas on the imports of sheep and mutton, yoghurts, potatoes, other sugars, pasta, ice-cream, and wine have been massively used long-term. In beef cattle, beef, pigs, pork, sunflower oil, margarins, non-alcoholic beverages, spirits, and dextrins fluctuations in the quota use have been reported. On the other hand, poultry meat, meat edible offal, powder milk, butter, must grape, starches, rape and sunflower seeds, rape-oil, and spirits have been reporting a low quota application. The Slovak Republic is among the WTO member countries with a low tariff quota use. (In the years 1995–1998, the SR quota use ranged between 37 and 47 per cent, although the WTO average was 46–65 per cent).

As distinct from its major business partners, the Slovak Republic has a very low average customs incidence because the tariff level is based on a low market protection applied prior to the Uruguay Round of GATT Agreement. In the majority of commodities, the customs level in the SR is below the EU and the CEFTA country levels. Therefore, the level of the reduction of the present customs level on the part of the SR is vital in the light of the commitments following from the WTO negotiations.

OBJECTIVE

To formulate the position of Slovakia within the context of the WTO negotiations, it is important to familiarise with the extent of a maximum admissible reduction of the domestic market tariff protection. The paper objective was the simulation of an average customs incidence of the so-called sensitive items of the Slovak agri-food foreign trade, while observing the requirement for at least a minimum protection of domestic producers.

METHODOLOGY

The Characteristics of Sensitive Items

Imported agri-food commodities of the 24 groups of the Harmonised System of Customs Tariff were broken down based on whether or not falling under the so-called non-substitutable import category, which are essentially commodities the country is unable to produce nationally and, at the same time, have a most significant impact upon the import volume, and their shortage on the domestic market is conducive to a marked growth of the import volume. In addition, this group of sensitive items is among the higher-tariff commodities which is a factor of the domestic trade protection. It is assumed that the upcoming WTO negotiations will bring about changes that will result in a further tariff drop; hence, it is important for the SR to know to what extent this process will affect the tariffs of sensitive items.

The 1998 bound duty effective under the Uruguay Round of GATT Agreement was applied to the customs value of 289 sensitive items of import. Hence, administrative duty was applied, and not the effectively assessed duty on each of the 289 sensitive items of the customs statistics; next, theoretical 1998 average administrative duty was calculated of the total volume of the theoretically assessed duty in 1998 and the import customs value. This procedure was applied to the entire import of sensitive items including/excluding the CR (with which Slovakia has a customs union). Also, the procedure was applied to the bound duty level effective under the Uruguay Round of GATT Agreement (of the same 289 sensitive items and identical import volumes, in the same customs values) for the year 2000 (the last year of the applicability of the commitments of the Uruguay Round of GATT Agreement). Further considerations were based on some pre-defined assumptions. The most important assumption was that if a minimum protection of domestic producers is to be ensured, the import price with duty (i.e. price at which identical imported goods would be sold on the Slovak market) would not fall below the level of the domestic producers reference price provided that the latter was not created by a monopoly or monopsonic position of interest groups.

Basic Algorithm

All the sensitive items (save for those for which a domestic equivalent was not available) were assigned/de-

rived domestic prices of the Slovak producers of identical goods. If the domestic price exceeded the import price (including the duty at the year 2000 level), the algorithm assigned a duty at the 2000 level, or, selected commodities with a lower, or, identical domestic price, and assigned a duty to them reduced against the year 2000 duty by a value of the difference between the import price (with the duty for the year 2000) and the domestic price. Thus, the duty level of the year 2000 was maintained in some commodities, and in others, reduced to a level at which the domestic price was equivalent to the import price (including the reduced duty). In this fashion, the simulated level of an average customs incidence of sensitive items after the year 2000 was set (using the 1998 parity of trade, customs value, and import volume).

Scenarios

There are two basic approaches to the evaluation of the impacts of the import duty reduction (with the Czech Republic included or excluded); however, as long as the CR and SR are in a customs union, it is irrelevant to evaluate the total import of sensitive items (Slovak trade with the CR is duty-free). Under the scenario of the CR being a member of the EU and the SR not, (and, subsequently, the customs union between the CR and the SR could no longer exist), the effect of the duty reduction under consideration was applied to the total import of all the sensitive items.

– Scenario 1 assumes that during the period under evaluation (1998–2003), the volume of the import of sensitive items in value terms will be made up of:

- unchanged (constant) quantities in terms of weight (at the 1998 level),
- import prices affected by the development of domestic and world prices in commodities in which price projections are feasible, or, inflation and currency exchange rate developments in commodities which do not allow for the projection of domestic and world prices.

Import duty after the year 2000 is a weighted average of the import duties of sensitive items calculated using the basic algorithm.

– Scenario 2 assumes that during the period under evaluation (1998–2003), the volume of the import of sensitive items will be made up of:

- changed (variable) quantity in terms of weight derived from the import of sensitive item groups in 1994–1998 (largely a logarithmic, attenuation function),
- import prices affected by the development of domestic and world prices in commodities in which price projections are feasible, or, inflation and currency exchange rate developments in commodities in which the projections of domestic and world prices are not feasible.

Import duty after the year 2000 will be proportionally reduced by a certain level in all the sensitive items within the next five-year period (with the exception of commodities with zero duty).

– Scenario 3 assumes that during the period under evaluation (1998–2003), the volume of the import of sensitive items will be made up of:

- changed (variable) quantity in terms of weight derived from the import of sensitive item groups in 1994–1998 (largely a logarithmic, attenuation function),
- import prices affected by the development of domestic and world prices in commodities in which price projections are feasible, or, inflation and currency exchange rate developments in commodities in which the projections of domestic and world prices are not feasible.

Import duty after the year 2000 is a weighted average of the import duties of sensitive items calculated using the basic algorithm.

RESULTS, DISCUSSION

The Characteristics of the 1998 Agri-food Import of the SR

The total volume of the Slovak foreign trade exchange and agri-food products in 1998 is shown in the Table 1.

The balance of the so-called non-substitutable commodities (bananas, citrus fruits, rice, soya meal, fish fillet, coffee, cocoa, and others) accounted for 35.1 per cent of the total balance.

The commodity structure of the SR agri-food import in 1998 indicates that in terms of volume, among the most significant commodity groups of the Slovak agri-food import were especially residues of milling and animal fodder (Group 23), miscellaneous edible preparations (Group 21), tobacco and tobacco substitutes (Group 24), preparations of cereals (Group 19), and also preparations of vegetables, fruits and nuts (Group 20), coffee, tea, and spices (Group 09), animal or vegetable fats and oils (Group 15), meat and edible meat offal (Group 02), edible vegetables, certain roots and tubers (Group 07), and preparations of meat, of fish (Group 16).

The territorial structure of the 1998 agri-food foreign trade of the SR is characterised by a positive trade balance only with the former Soviet Union countries and the "rest of Europe" (Norway, Lichtenstein, Switzerland, Croatia, Macedonia, Yugoslavia, Bosnia, Hercegovna, Albania, and Iceland).

In 1998, the residues of milling and animal fodder, edible fruits and nuts, miscellaneous edible preparations,

preparations of vegetables, fruits, and preparations of cereals and milk were among the commodities imported from the EU.

The 1998 import from the CEFTA countries was largely composed of tobacco products, spirits, miscellaneous edible preparations, and preparations of cereals and milk.

The 1998 agri-food import from the CR was dominated by tobacco products and spirits, preparations of cereals and milk, animal and vegetable fats, and miscellaneous edible preparations.

The Slovak agri-food market is rather poorly protected against import and this protection is falling. In 1998, the import of agri-food commodities to Slovakia reported a 2.92 per cent average customs incidence. In some commodity groups, customs protection is almost non-existent (products of animal origin, vegetable plaiting materials, fish and molluscs), or the protection is insignificant (residues and waste, animal fodder, preparations of meat, of fish, live animals, edible fruits and nuts, and the like). The 1998 average customs incidence, even when disregarding the Slovak agri-food foreign trade with the Czech Republic, was reported to be 4.31 per cent.

The involvement of Slovak agriculture in the international integration processes which are conducive to a gradual opening-up of the Slovak market and lifting the barriers to international trade exchange is contingent on the WTO General Agreement on Tariffs and Trade and the European Agreement on the Association of the SR to the EU (Association Agreement).

The Share of Sensitive Items in the Total Agri-food Import of the SR

In 1998, sensitive items accounted for 28.6 per cent of the total Slovak agri-food import (in the parity of trade value). From the Harmonised System of Customs Tariff point of view, the commodities of this category were listed in groups 01, 02, 04, 07, 08, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, and 24.

Given the fact that the SR and the CR are in a customs union, it is irrelevant to specify the share of the total import of sensitive items in the total import volume. When taking the criterion into account, sensitive items (excluding the CR) accounted for 13.1 per cent of the total agri-food import of the SR.

In 1998, the Slovak agri-food import of sensitive items from the EU countries accounted for 13.1 per cent of the total import from these countries.

The 1998 Slovak agri-food import of sensitive items from the CEFTA countries (excluding CR) accounted for 34.8 per cent of the total import from these countries.

To provide a complete picture, it should be noted that in 1998, sensitive items accounted for 59.6 per cent of the total import from the CR which corroborates the fact that a contingent duty reduction in this commodity category (within the framework of further WTO negotiations) will not fully encumber the Slovak import as long as the SR and the CR will continue to operate as a single customs territory.

Table 1. Total trade and share of agro-products (billion SKK)

Indicator	Import (parity of trade)	Export (fco)	Balance
Total:	456.7	375.9	80.8
of which agricultural sector	31.3	16.1	15.2
% share of the total	6.8	4.3	18.8

Source: SR customs statistics

In 1998, the CR accounted for 69.38 per cent of the total import volume of sensitive items, CEFTA countries by 80.16 per cent, and the EU by 17.66 per cent. If, for reasons mentioned above, the 1998 shares of sensitive items in the import volume of sensitive items are net of the share of import from the CR, then the CEFTA share (the CR excluded) is 35.22 per cent, and the EU share is 57.68 per cent. From what has been said, it is obvious that the expected reduction of tariffs is likely to have a more dramatic effect upon the changes in the volume of imports from the EU and the CEFTA countries.

The Food-stuff Import Share in Food Production and Domestic Consumption

In 1998, agriculture and food industry accounted for 8.08 per cent of the gross domestic product of Slovakia. Altogether, agri-food commodities accounted for as much as 6,8 per cent of the total Slovak import, however, their share in the negative balance of foreign trade amounted to 18.8 per cent. This is largely due to a low export performance (4.3 per cent of total import) and a rather poor competitiveness of these commodities.

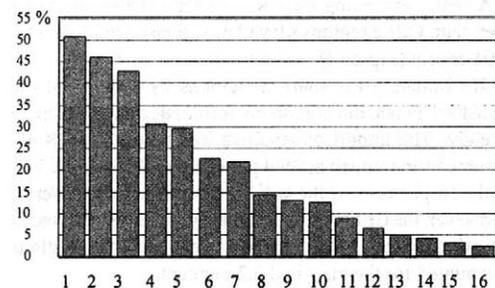
By matching the commodities of the Harmonised System of Customs Tariff of the 1998 import with the corresponding branches of food industry (based on the 1-02 Food Schedule of the Ministry of Agriculture of the SR), a rough estimate of the share of import in the domestic

food production, or, consumption (processed and end products of the agri-food sector) can be made. For the purposes of our analysis, and given the unavailability of appropriate statistical data, domestic consumption was conceived as production increased by 20 per cent mark-up. As shown in the graphs below, the import share in domestic production was quite significant in some food industry branches.

This share was markedly manifested largely in the production of non-alcoholic beverages, fish processing, canning industry, sugar confectionery and pastry industry, production of coffee and coffee substitutes, distilling and fats industries. In these branches, the import volume in value terms exceeded 20 per cent of domestic consumption. Such a high import is not only a result of a low domestic market protection but also an inadequate competitiveness and a low level of domestic offer (Graph 1 and 2).

The branch structure by the sensitive item import share varies. By far the highest share was reported in freezing industry (30 per cent), confectionery and pastry industry, coffee production and distilling industry (18 per cent). Six other branches reported shares exceeding five per cent of import (Figure 3).

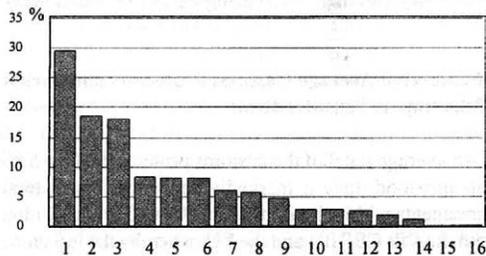
Processed food commodities accounted for 52 per cent of agri-food import. However, animal nutrition products for which domestic resources¹ are partly available, represented a large import group. In import (excluding the CR) they reported a 16 per cent share. Agricultural commod-



- 1 Production of non-alcoholic beverages
- 2 Fish processing
- 3 Canning industry
- 4 Sugar confectionery and pastry industries
- 5 Freezing industry
- 6 Distilling industry
- 7 Fats industry
- 8 Sugar-refining industry
- 9 Meat industry
- 10 Baking and confectionery industry
- 11 Poultry industry
- 12 Beer industry
- 13 Milk industry
- 14 Wine industry
- 15 Starch industry
- 16 Milling industry

Domestic consumption = production - export + import

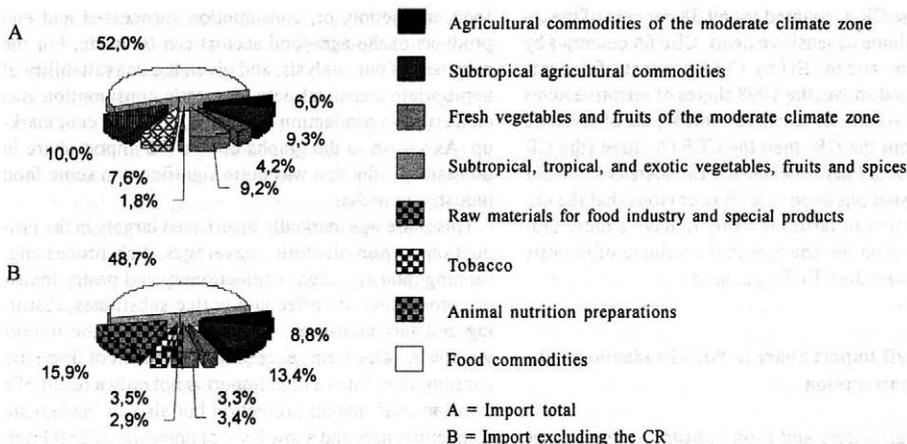
Graph 1. Import Share in Domestic Consumption, by Branches of Industry



- 1 Freezing industry
- 2 Confectionery and pastry industry
- 3 Distilling industry
- 4 Meat industry
- 5 Poultry industry
- 6 Production of non-alcoholic beverages
- 7 Beer and malt industry
- 8 Canning industry
- 9 Fats industry
- 10 Wine industry
- 11 Milk industry
- 12 Baking and confectionery industry
- 13 Starch industry
- 14 Sugar-refining industry
- 15 Milling industry
- 16 Processing industry

Domestic consumption = production - export + import

Graph 2. Sensitive Item Import Share in Domestic Consumption, by Branches



Graph 3. Commodity Group Shares in Import

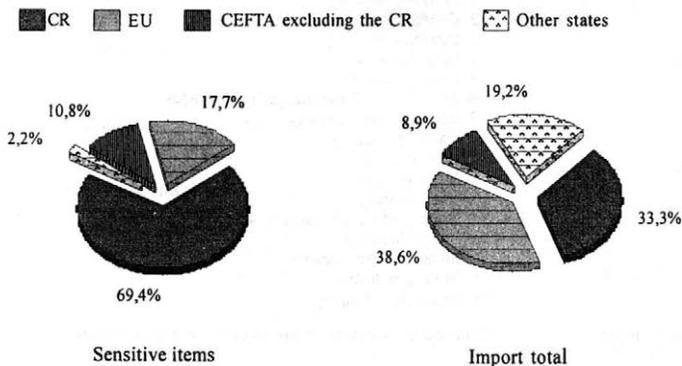
ities accounted for 6 per cent (9 per cent, excluding the CR) of the Slovak agri-food import. Tobacco import share was 7.6 per cent, subtropical and tropical fruits, vegetables, and spices 9.1 per cent. It is assumed that with the advancement of production, intensification and technological restructuring, marketing, and other positive factors, it would be feasible to replace at least 20 per cent of import with domestic resources without a need to create more barriers to trade (fruits, vegetables, animal nutrition, non-alcoholic beverages, sugar confectionery and pastry industry, canning and freezing industries, and others).

The Level of Average Customs Protection and Tariffs of the Import Sensitive Items

An average level of the customs protection of the Slovak agri-food trade is markedly dependent on bilateral agreements within the framework of the Customs Union with the CR; CEFTA, and the EU, whereby the influence

of the Customs Union is crucial. Given the fact that the commitments under the Customs Union cannot serve as arguments on the part of the SR in the current WTO negotiation round, it is necessary to evaluate the Slovak customs protection level objectively, net of the imports from the Czech Republic. The graph below provides a clear picture of the situation. The share of import from the CR in the total 1998 agri-food import amounted to 33 per cent, the EU reported 39 per cent share, and the CEFTA share, excluding the CR, was reported to be only 9 per cent. Other regions played only a marginal role with 19 per cent (Figure 4).

If evaluating the share of regions by imports of the sensitive items, the arguments formulated above gain on weight. The import of sensitive items from the CR accounted for as much as 69.4 per cent, while from the EU, only 18 per cent of the total import of sensitive items. However, the CEFTA share, similarly to the CR, (i.e. much less dramatically) increased to 11 per cent. Other regions accounted for the marginal 2.2 per cent.



Graph 4. Import Shares According to Regions

¹ For instance, rape and sunflower oil meal instead of imported soya meal

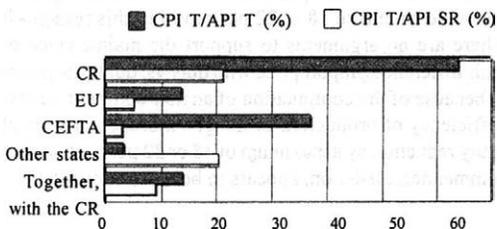
An outcome of this brief analysis are two facts that differ depending on the approach adopted:

1. Sensitive items are "sensitive" because Slovak trade with the CR is highly sensitive, and it is also partly sensitive with the EU and CEFTA, and the results of another WTO negotiation round which, (understandably enough) does not deal with bilateral agreements, will not have a dramatic effect upon the agri-food trade of Slovakia. However, Slovak agri-food trade will be affected by them within the context of the results achieved by the European Union, USA, and the Cairns group;
2. Sensitive items are "sensitive" and of relevance to the Slovak customs protection because a further deterioration of this level of customs protection may result in the import from other regions exerting pressure upon the level of the preferred terms of trade mutually granted between Slovakia and the CR, and the EU.

With regard to the task defined, the authors of this paper support the application of the arguments presented in the second proposition.

The share of the import of sensitive items from the CR in the total import from the CR accounted for as much as 60 per cent, from the EU, only 13 per cent, and from the CEFTA countries, 35 per cent. Goods imported from other regions do not face any competition in the local market and are in high demand. It is estimated that these goods account for about 20 per cent of the import volume. This indicates that it is a big problem for Slovakia to compete in all the basic, i.e. "common" commodities traditionally produced in the Central European region of the moderate climate zone (Graph 5).

The transformation and restructuring of agriculture and food industry has not met the original expectations and goals. It is an ongoing process that will continue. Therefore, it is necessary to set a level of protection of the domestic market below which further drop is unacceptable for Slovakia. It is likely that this argument will also be advocated by the Czech Republic, which deals with similar transformation and restructuring problems in agriculture. Our analyses indicate that in the majority of



CPI T – import of sensitive items from the given region
 API T – agri-food import from the given region
 API SR – total agri-food import of Slovakia

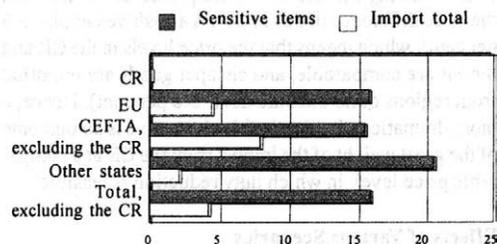
Graph 5. The Import Share of the Sensitive items

sensitive items, the CR is able to successfully compete in the Slovak market. The position of Hungary is similar and in addition, being an agricultural, export-oriented country, Hungary will be interested in market liberalisation, which does not correspond with our goal (Graph 6).

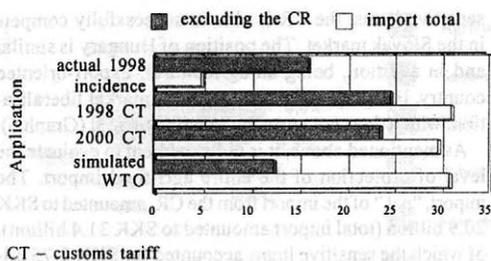
As mentioned above, it is not expedient to evaluate the level of protection of the entire agri-food import. The import, "net" of the import from the CR, amounted to SKK 20.9 billion (total import amounted to SKK 31.4 billion), of which the sensitive items accounted for SKK 2.75 billion (i.e. 13 per cent). Their average incidence was 16.1 per cent. As distinct from the 4.3 per cent incidence of the total import, this is an almost four times higher incidence. The incidence of the import from other countries amounted to as much as 21 per cent, from the CEFTA countries (excluding the CR) 15.6 per cent. It seems that there is not much potential for further liberalisation of the agri-food trade within the CEFTA grouping. The customs incidence of the imports from the EU (15.9 per cent) is at the CEFTA level of incidence, however, the import volume is much greater. The customs incidence of the total import from the CEFTA countries is almost double the average of all the imports (net of the CR), which only corroborates the above considerations.

By applying the 1998 Uruguay Round GATT commitments to the 289 import sensitive items, excluding the import from the CR (irrespective of bilateral agreements), the average customs incidence of imports would increase to 24.7 per cent, in other words, mutual (Slovak-Czech) agreements and the corruption, the effect of which is difficult to measure, would reduce protection in sensitive items by 8.6 per cent. By applying the Uruguay Round GATT commitments also to the import from the CR, the customs incidence would increase to as much as 31.1 per cent. The application of our commitments would appropriately reduce our administrative average customs incidence of sensitive items to 23.6 per cent (excluding the CR), or, 29.8 per cent (including the CR), which is a drop by approx. 4 per cent.

If minimum protection of domestic producers is to be ensured, import price with duty should not drop below the reference price level of domestic producers on the condition that this price is not a reflection of the monopoly and monopsony positions of the interest groups. A



Graph 6. Average Customs Incidence



Graph 7. Average Customs Incidence of Sensitive Items

simulated level of the average customs incidence of sensitive items set in this fashion should not drop below 19.3 per cent after the year 2000 (using the 1998 import and prices). This cumulated value of the average customs incidence is, as opposed to the 1998 commitments of Slovakia applied to the import of individual sensitive items, by 5.4 per cent lower than in 1998 (24.7 per cent), or, 4.3 per cent lower than when applying the commitments for the final year 2000, in which the WTO agreements will terminate (23.6 per cent). Hence, the position of Slovakia in the upcoming WTO negotiations reflects its willingness to agree to a general reduction of duties on agri-food commodities (derived from the sensitive item group) by 18 per cent (19.3 per cent/23.6 per cent) (Graph 7).

Should any unforeseen events take place within the SR-CR Customs Union (theoretically, if the Customs Union is abolished), our position, given the scale of the mutual trade, would be more difficult. In such a case, the interpretation of the simulated results must be more conservative. The cumulated incidence calculated by applying the year 2000 bound duties to the entire agri-food import of 289 sensitive items (including their import from the CR) amounted to 29.8 per cent. The simulated level of the average customs incidence of these sensitive items after the year 2000 (using the 1998 prices and import) dropped to 23.3 per cent. Indeed, this is by far a higher percentage than the import net of the CR, however, at the same time, it is a drop by 22 per cent (23.3 per cent/29.8 per cent). A logical outcome of the application of WTO bound duties also to the import from the CR ought to be an increase in the average customs incidence which has been proven. A more dramatic reduction as distinct from the simulation excluding the CR is a consequence of the fact that the price difference of this import is a positive Graph(+3.9 per cent), which means that the price levels in the CR and the SR are comparable, and cheaper goods are imported from regions other than the CR (-3.8 per cent). Hence, a more dramatic reduction in this alternative is an outcome of the great weight of the import from the CR at a comparable price level, in which duty reduction is feasible!

Effects of Various Scenarios

In accordance with the methodology, there were simulated differentiated levels of import and prices and their

effect upon the level of customs protection. The results indicate the following:

- under the scenario of the existence of the Customs Union between the SR and the CR (i.e. cases "excluding the CR"), there will be negative differences between the average import price of sensitive items with duty and an average domestic reference price starting from the year 2001. In other words, the average import price with duty will be below the average domestic reference price (with the exception of Scenario 2);
- under the scenario of the non-existence (abolished) Customs Union between the SR and the CR (i.e. cases of the total import of commodities falling under the category of sensitive items), in 2001, positive differences between the average import price with duty and the average domestic reference price will be demonstrated only in scenario 1; in 2002, in scenarios 1 and 2, however, the above differences are relatively small, i.e. domestic reference prices will be only slightly below the average import prices with duty.

This alludes to the fact that when considering duty reduction under the scenario of the existence of the SR-CR Customs Union, commodities falling under the category of sensitive items will be non-saleable in the domestic market starting from 2001. In the case of the non-existence of the Customs Union between the SR and the CR after the year 2000, a total non-saleability of sensitive items in the domestic market would be postponed to the year 2002. This indicates that the domestic prices of sensitive items are high and non-competitive related to the import prices with duty; hence, there is a need to make the domestic production of these commodities more efficient within a short period of time. Otherwise Slovakia would have to try to maintain the current domestic market customs protection within the WTO, which is not viable.

The differences between the simulated scenarios in general (taking account of their relative nature) indicate that a general duty reduction is a solution more acceptable for Slovakia than reduction based on levelling off the prices of import and domestic market. This is justified by higher domestic prices of goods with a great weight in the category of sensitive items in which a reduction to the world price level would be much greater than the simulated 18 or 22 per cent. For this reason - if there are no arguments to support the maintenance of this difference (import price with duty vs. domestic price) - because of the continuation of an non-competitive low efficiency of production of the given branch, a general duty reduction by a maximum of 18 or 22 per cent, as recommended earlier on, appears to be more convenient.

CONCLUSION

The position of Slovakia in the WTO negotiations reflects its willingness to agree to a general reduction of duties on agri-food commodities under groups 1-24 of the Customs Tariff (derived from the category of sensitive items), by 18 per cent maximum. The differences be-

tween the simulated scenarios in general (taking account of their relative nature) indicate that a general duty reduction is more convenient for Slovakia than a reduction based on levelling off the prices of import and domestic production. This is justified by higher domestic prices of goods with a great weight in the category of sensitive items in which a reduction to the world price level would be much greater than the simulated 18 per cent. For this reason – if there are no arguments to support the maintenance of this difference (import price with duty vs. domestic price) – because of the continuation of the non-competitive low efficiency of production of the given branch, a general duty reduction, provided that Slovakia would have to consent to that, is more convenient.

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Arrived on 17th November 2000

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Ekonometrické modely při analýze struktury tvorby hospodářského výsledku sektoru zemědělství

The economic results of the agriculture sector analysed by econometric models

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Abstract: The synthetic (global) macro-economic views of the national economy results issue from the analysis of the basic "quadrangle" structure formed by gross national product, employment, inflation and the foreign trade impact. For the sector of agriculture, this quadrangle is modified to the analysis of the profit (event. value added) dependence on labour, production area (intensity indicator) and the cost-investment activities. In the form issuing from the exogenous relative indicators, there is taken into consideration the impact of intensity, productivity and profitability. There are analysed the structures specific and interesting for the economic mezzo-sphere, resp. micro-sphere. In the thesis, these structures are analysed on the sector data. Macro-economic (mathematic-statistical) estimates of the dependence of profit, resp. value added on the mentioned three relative, resp. absolute factors are provided in different variants, issuing from their different statistical measurings, i.e. from their expression through different indicators. The individual dependencies (models) are discussed in detail both from the used statistical data point of view, as well as with regard to their further use for simulation computations.

Key words: economic result of agriculture, economic micro-models, profit, value added

Abstrakt: Syntetické (globální) makroekonomické pohledy na výsledky národního hospodářství vycházejí z analýzy základní „čtyřúhelníkové“ struktury tvořené hrubým domácím produktem, zaměstnaností, inflací a vlivem zahraničního obchodu. Pro odvětví zemědělství je v práci tento čtyřúhelník modifikován na analýzu závislosti zisku (popř. přidané hodnoty) na pracovní síle, výměře (ukazatel intenzity) a nákladově-investiční činnosti. V pojetí vycházejícím z exogenních poměrových ukazatelů se uvažuje vliv intenzity, produktivity a rentability. Jsou analyzovány struktury, které jsou specifické a zajímavé pro ekonomickou mezzosféru resp. mikrosféru. Práce tyto struktury zkoumá na datech odvětvové úrovně. Jsou prováděny ekonometrické (matematicko-statistické) odhady závislosti zisku resp. přidané hodnoty na zmíněných třech poměrových resp. absolutních faktorech v různých variantách, které vycházejí z jejich různých statistických měření, tzn. z jejich vyjádření pomocí různých veličin. Jednotlivé závislosti (modely) jsou podrobně diskutovány jak z hlediska použitých statistických podkladů, tak i z hlediska jejich dalšího použití k simulačním výpočtům.

Klíčová slova: ekonomický výsledek zemědělství, ekonometrické mikromodely, zisk, přidaná hodnota

LITERÁRNÍ PŘEHLED

Práce navazuje na dřívější práci Linharta a Froňka (1991). Některé metodické náměty a jejich zasazení do širšího metodického kontextu lze nalézt ve Froňkové práci (1991). Tvorba a aplikace jednoduchých ekonometrických modelů založených na regresní analýze resp. metodě nejmenších čtverců je popsána v řadě publikací. Základní učebnicový charakter má kniha Drapera a Smithe (1966). Ekonometrické modelování je popsáno v monografii Malinvaudové (1969). Přehled o matematických metodách a jejich vlastnostech dává také obsáhlá kniha, jejímiž autory jsou Zwillinger a Kokoska (2000). Této publikace je mj. užito ve formulaci pravděpodobnostního parametru P při popisu výsledků matematicko-statis-

tických testů. Pro odhad jednotlivých závislostí je užito výsledků zpracování Souhrnného zemědělského účtu tak, jak je prováděno ve VÚZE. Formulace statistického obsahu použitých údajů vychází z metodické práce Foltýnovy (2000) a z rozsáhlejší práce Foltýna, Zedníčkové a Fischera (1998). Statistické podklady byly čerpany z několika ročníků Zpráv o stavu zemědělství ČR.

METODIKA

Syntetické (globální) makroekonomické pohledy na výsledky národního hospodářství nebo jeho odvětví vycházejí z analýzy základní struktury („čtyřúhelníku“),

kteřá je tvořena hrubým domácím produktem (jeho vývojovou tendencí), zaměstnaností, inflací a vlivem zahraničního obchodu. Základním problémem je kvantifikace vzájemné souvztáhnosti faktorů a výsledku. Při verbálních úvahách může sice být tento kvantitativní popis výsledkem expertního odhadu, ale je rozhodně vhodnější využít některých ekonometrických postupů, jejichž výsledky naopak dávají podklad pro další následné expertní úvahy.

Pro jednotlivá odvětví národního hospodářství je užitečné modifikovat ekonomický obsah zmíněné čtveřice se zřetelem na jeho specifiku. Pro zemědělství to tedy může být vhodná analýza závislosti zisku na pracovní síle, výměře (ukazatel měřící extenzitu) a nákladově-investiční činnosti (odpisech). V relativním pojetí se jedná o vliv intenzity, produktivity a rentability resp. veličin, které je měří. Současně se však jedná o přechod na mezzoeconomické resp. mikroekonomické pojetí problematiky. Zatímco výše uvedený pohled na celé národní hospodářství („čtyřúhelník“) měl jednoznačně makroekonomický charakter, má analýza vlivu intenzity, produktivity a rentability na úroveň hospodářského výsledku (speciálně zisku) podnikový charakter. To znamená, že jsou zde vlastně analyzovány struktury, které jsou specifické a zajímavé pro ekonomickou mikrosféru, speciálně pro podnik, i když je analýza prováděna pro celé odvětví národního hospodářství. Toto odvětví je v případě zemědělství výstižně popisováno termínem „národní farma“.

Celková analýza národního hospodářství, která je prováděna v rámci struktury „čtyřúhelníku“ tvořeného hrubým domácím produktem, zaměstnaností, inflací a vlivem zahraničního obchodu, má obvykle spíše kvalitativní charakter. V tomto textu je podána kvantitativní charakteristika ekonomické struktury tvorby výsledku odvětví zemědělství formou jednoduchých modelů v pojetí, které odpovídá mikroekonomické analýze.

Je zřejmé, že pro podnikové užití výsledků metodicky shodných s touto analýzou by bylo nutné provést nové propočty modelových parametrů vycházející z podnikových údajů. Základní metodický pohled na věc by se však neměnil. To by tkvělo v tom, že by se metodicky využilo výsledků obsažených v následujícím textu mj. tak, že by se i při podnikové analýze vycházelo u exogenních (nezávisle) proměnných spíše z relativních veličin, než z absolutních.

Kromě zisku (ve dvojím statistickém pojetí) je zde pro měření ekonomického výsledku zemědělství užito hrubé přidané hodnoty a čisté přidané hodnoty, které představují důležité prvky souhrnného zemědělského účtu. Jejich statistické vymezení je podáno v dalším textu.

V následujícím textu jsou uvedeny některé vybrané výsledky ekonometrických propočtů, které byly prováděny pro čtveřice veličin, které jsou makroekonomickými ukazateli pro odvětví zemědělství ČR. Jedná se o relativně simplifikované modely, jejichž vlastním účelem je umožnit odborné veřejnosti vědecko-analytické i vládní a správní rychlou orientační informaci ověřující účinnost souboru předpokládané úrovně exogenních faktorů při tvorbě ekonomického výsledku odvětví. Poměrně pře-

hledné a jednoduché funkce tří proměnných umožní rychle propočty bez využití složitých bilančních metod, které vyžadují rozsáhlý podkladový materiál, který je spojen s rizikem kumulace chyb vyplývajících ze značného rozsahu souboru dílčích podkladů.

I když se jedná o ukazatele stejného ekonomicko-teoretického vymezení a tudíž stejného ekonomického obsahu, může se jejich kvantifikace lišit v závislosti na statistické metodice jejich šetření. Ta je navíc ovlivněna i metodikou základního pořizování dat (celkové šetření, výběrové šetření) a to jen zvyšuje kvantitativní diferenciace výsledků reprezentujících daný ekonomický ukazatel.

Získané závislosti nemají absolutizovaný charakter, ale každá z nich představuje určitý specifický pohled na danou problematiku. Z hlediska noetického se širšího pohledu na věc dosáhne spojením a konfrontací výsledků. Pro prognostické užití, které má simulačním postupem ověřovat předpoklady o budoucím vývoji, je nutné kritickou analýzu spojit s dalšími věcnými úvahami, s expertními odhady apod.

Do tohoto textu byly až na jednu výjimku zahrnuty pouze lineární závislosti. Důvodů pro takový postup je více. Technicko-věcným je skutečnost, že zisk, který je často užíván jako závisle proměnná, nabývá záporných hodnot. Tím jsou transformační možnosti závisle proměnné značně omezeny a jejich užití pro odhad parametrů řešení lineárních normálních rovnic při metodě nejmenších čtverců je v některých případech nemožné. Další důvod plyne z provedení některých alternativních výpočtů, které ukázaly, že např. logaritmická transformace exogenních proměnných, při které je zachována linearita v parametrech, nepřináší podstatné zlepšení pro výpočet endogenní proměnné. Poměrně krátké časové řadě navíc vyhovuje lineární závislost jako vhodná relativně lokální aproximace ostatních možností. Lineární závislost také při jednotném použití dává poměrně širokou možnost vzájemné komparace jednotlivých modelů.

Základem práce je matematicko-statistické (ekonometrické) stanovení obvyklou metodou nejmenších čtverců, parametrů funkcí, které popisují strukturu závislosti ukazatelů ekonomického výsledku zemědělství (endogenní proměnné, závisle proměnné) na některých faktorech (exogenních proměnných, nezávisle proměnných), které jí ovlivňují.

Pro tyto závislosti se v textu užívá též pojmu model I, když se jedná o matematicky poměrně jednoduché objekty, je přece jen možno tohoto pojmenování užít, protože se jedná o modelové postižení, i když zjednodušené, struktury jistého ekonomického jevu.

Ke každé závislosti byl počítán také obvyklý soubor matematicko-statistických výpočtů, které hodnotí ziskovou funkci. Jednalo se o obvyklou analýzu rozptylu pro vhodnost proložení a testování *t*-testem významnosti jednotlivých koeficientů spojené se statistickými charakteristikami jejich přesnosti. Pro jednotlivé testy byla udána tzv. *P*-hodnota, která představuje nejmenší velikost hladiny významnosti, při které je hypotéza o nevýznamnosti testu (modelu, koeficientu) zamítnuta (srovnej Zwillinger, Kokoska 2000). Protože *P*-hodnota je pravdě-

podobnost, pohybuje se její velikost od 0 do 1. Jestliže je P malé, znamená to zde, že je koeficient statisticky významný. Je tedy velmi malá pravděpodobnost, že pro naše data při analýze jednotlivých koeficientů zamítneme hypotézu o nevýznamnosti regresního koeficientu, která ve skutečnosti platí. Naopak při větším P je pravděpodobnost takového chybného rozhodnutí („chyby prvního druhu“) velká, což znamená, že lze považovat odpovídající koeficient za statisticky nevýznamný. V tomto textu bude věnována pozornost pouze koeficientům u proměnných. Absolutní člen má vlastně význam výpočetní a jeho interpretace je především užitečná pouze s ohledem na zasetí výpočtu endogenní proměnné do věcně vyhovujícího intervalu. Obdobná úvaha platí o interpretaci P při analýze rozptylu, kdy je testován celý model a vhodnost jeho užití jako celku a tím i do jisté míry jeho simulačně-predikční použitelnost.

Důležitou komparativní charakteristiku bylo násobné R , (odmocnina z charakteristiky R^2 , koeficient vícenásobné korelace), které představovalo jednak souhrnný pohled na vhodnost volby daného modelu a jednak umožňovalo rychlou komparaci mezi jednotlivými modely.

Při popisu jednotlivých závislostí je třeba mít na paměti, že i když koeficienty u některých proměnných jsou nevýznamné, neznamená to, že se jich vzdáváme při predikčních výpočtech. Tam obvykle zvyšují přesnost odhadu. Nevýznamnost lze chápat jako upozornění na zmenšení míry vlivu dané exogenní proměnné na endogenní proměnnou.

Při konstrukci modelu se vycházelo vždy z ročních údajů v časové řadě let 1994–1999. Je to poměrně krátká časová řada, pouze 6 let, ale představuje výsledek relativně srovnatelných, když už nelze napsat homogenních, ekonomických poměrů. Pro výpočetní statistické účely je však další zkracování řady nepřijatelné a vedlo by k relativní destrukci vypovídacích schopností modelů. Stejně dlouhá časová řada je jednou z podmínek vzájemné srovnatelnosti modelů. Z těchto důvodů bylo vhodné, že se v těch případech, kdy nebyly pro některé roky údaje zcela nebo částečně k dispozici, přistoupilo k jejich statistickému odhadu. Pro větší informaci bylo zvoleno i několik různých postupů pro takové odhady a pro každý způsob odhadu byl počítán zvláštní model. Blíže o způsobu odhadů bude pojednáno v dalším textu při popisu jednotlivých závislostí.

Po odhadu modelu bylo jako základní modelový proceť prováděno empirické ověření vhodnosti modelu tím, že pro hodnoty nezávisle proměnných, ze kterých se vycházelo při konstrukci modelu, byly pomocí získané funkce počítány hodnoty endogenní (závisle) proměnné, které byly srovnávány se skutečností. Kvalitativní popis stupně této shody je v textu obvykle formulován jako krátká úvaha o shodě se skutečností.

VÝSLEDKY A DISKUSE

Ze všech výpočtů, které byly prováděny, jsou zde uvedeny jen ty, které dávají smysluplné výsledky, které mo-

hou být použity při dalších, zejména predikčních aplikacích. Postupovalo se tedy metodou kritického výběru, kdy jedním z hlavních hledisek byla míra shody výsledků modelu se skutečností v konstrukčním období, tj. v tom období, ze kterého se vycházelo při odhadech parametrů.

Koeficienty u proměnných jsou uváděny tak, aby umožňovaly provedení výpočtů a odpovídají přesnosti výsledků zapisovaných na počítači. Nebyla tedy prováděna zaokrouhlovací unifikace na shodný počet desetinných míst.

Dále ještě něco o značení. Pro větší přehlednost není v tomto textu užito obvyklého matematického značení s jednoduchými symboly, které jsou dle potřeby indexovány, ale značení proměnných se provádí celými slovy nebo srozumitelnými zkratkami, které vyjadřují jejich význam, tedy např. „zisk“, „HPH“ atp. Nejlepší aplikovatelné modelové výsledky byly získány s poměrovými ukazateli (exogenními proměnnými), Takové veličiny jsou značeny v závorkách dvojicí tvořenou slovy popř. zkratkami. Prvky dvojice jsou v takovém případě odděleny znakem „/“. Pokud je užito absolutního ukazatele (závisle proměnná, ale někdy i nezávisle proměnné), je samozřejmě užito jednoduchého slovního popř. zkratkovitého značení bez operačních symbolů, tedy např. „zisk“ nebo „HPH“ apod. Jestliže tedy je užito symbolu (zisk/náklady), znamená to, že daná proměnná představuje poměr zisku a nákladů a tedy zobrazuje zisk na jednotku nákladů. Obdobně (KZP/výměra) je poměrem konečné zemědělské produkce a výměry, vyjadřuje tedy konečnou zemědělskou produkci připadající na jednotku výměry. Výrazem (KZP/pracovník) se označuje produktivita, tedy KZP připadající na pracovníka. Někdy je za označení proměnné přidáno ještě v závorkách vysvětlení o jejím původu. Tak např. značení (VÚZE) znamená údaje o úrovni zisku vypočtené metodou Výzkumného ústavu zemědělské ekonomiky. Při značení matematických operací jsme se přidrželi „počítačového“ značení, takže symbol „*“ znamená násobení.

Je také užitečné přijmout některé terminologické konvence. Pro ukazatele vzniklé dělením dvou ukazatelů se v textu užívá označení poměrové a pro ukazatele netransformované, „jednoduché“, jako je třeba počet pracovníků, se užívá pojmu absolutní. Nejedná se tedy v tomto případě o absolutní hodnotu v matematickém slova smyslu.

Nejprve budou popsány závislosti, při jejichž konstrukci se vychází při hodnocení ekonomického výsledku odvětví zemědělství především z veličin v pojetí souhrnného zemědělského účtu (SZÚ). Konečná zemědělská produkce (KZP) je v SZÚ součtem veškeré zemědělské produkce, která opouští zemědělské podniky pro další užití včetně exportu (údaje v aktuálních tržních cenách, mil. Kč.). Odečte-li se od této veličiny mezipotřeba (součet veškerých přímých i nepřímých výrobních vstupů), získá se hrubá přidaná hodnota (HPH) pro zemědělství v tržních cenách. Náklady jsou podle SZÚ definovány jako součet mezipotřeby, daní k produkci, odpisů, nákladů na pracovní sílu, pachtovného a úroků.

Prvá závislost má tvar

$$\text{HPH} = 14,51805 + 99,20658 * (\text{zisk/nákl.}) + 0,256887 * (\text{KZP/výměra}) + 33,86256 * (\text{KZP/pracovník})$$

Přítom jednotky pro HPH, zisk, náklady a KZP jsou mil. Kč, výměra je udána v tis. ha a pracovní síla je vyjádřena počtem osob. Při poměrových číslech, která jsou zde užitá, je rentabilita (zisk/náklady) nepojmenované číslo vyjadřující počet jednotek (Kč) zisku připadajících na jednotku (Kč) nákladů. Intenzita (KZP/výměra) vyjadřuje objem konečné zemědělské produkce (v tis. Kč) připadající na jeden hektar zemědělské půdy a konečně produktivita vyjadřuje objem KZP (mil. Kč) připadající na jednoho pracovníka. Zisk, náklady, KZP a počet pracovníků jsou zde vzaty ze souhrnného zemědělského účtu, výměra je podle Statistické ročenky půdního fondu ČR. Všechny údaje jsou převzaty z publikace ve Zprávách o stavu zemědělství ČR.

Je tedy HPH zemědělství chápána jako funkce rentability (zisk/náklady), intenzity (KZP/výměra) a produktivity (KZP/pracovníka). Pro tuto závislost je násobné $R = 0,996$, což je velmi uspokojivý výsledek. Shoda s tendencí a velikostí mezi modelovými odhady a skutečností je uspokojivá. Tato funkce má poměrně dobré možnosti predikčního užití; je zajímavé, že proměnná (KZP/výměra) má podle testu velmi málo významný vliv ($P = 0,485$).

V další závislosti je závisle proměnnou zisk (v mil. Kč – opět podle SZÚ)

$$\text{zisk} = -1\,357,64 + 110\,854,2 * (\text{zisk/náklady}) + 75,44555 * (\text{KZP/výměra}) - 1\,094,29 * (\text{KZP/pracovník})$$

Také zde je násobné R vysoké (0,998). Pro referenční roky je však shoda mezi skutečností a jejím zpětným odhadem z modelu poněkud horší. I když je tato funkce v praxi poněkud méně užitečná než předchozí, potvrzuje základní tendence v ovlivnění ekonomického výsledku vzhledem k předpokládaným nárůstům nebo poklesům zisku. Jednotky jsou pro exogenní proměnné samozřejmě stejné jako v předchozím případě. Menší užitečnost potvrzuje i dosti malá významnost koeficientů u (KZP/výměra) i (KZP/pracovník), přestože hodnocení modelu jako celku analýzou rozptylu je poměrně příznivé. To znamená, že zvolená struktura je poněkud problematická (záporný koeficient u produktivity) i když její znalost je nesporně užitečná.

Další závislost vyjadřuje strukturu tvorby HPH v zemědělství (opět v tržních cenách) v závislosti na rentabilitě (zisk/náklady – měrné jednotky jako výše), intenzitě (hrubý domácí produkt vytvořený v zemědělství – HDP – v tis. Kč na výměru v ha) a na produktivitě (HDP zemědělství v mil. Kč na pracovníka). Přitom hrubý domácí produkt byl určen pomocí podílu zemědělství na celkovém HDP z údajů HDP pro celé národní hospodářství podle publikace ve Zprávách o stavu zemědělství ČR. Závislost má tvar

$$\text{HPH} = -2,75724 - 44,0227 * (\text{zisk/náklady}) - 0,57073 * (\text{HDP/výměra}) + 294,5935 * (\text{HDP/pracovník})$$

Při kontrolních propočtech této funkce je opět velmi dobrá shoda se skutečností a analýza rozptylu též potvrzuje její vhodnost pro predikční užití. Také násobné $R = 0,998$ je vysoké. Zajímavé je, že opravdu významný je koeficient u produktivity (HDP/pracovník), kdežto koeficient u (HDP/výměra) je málo významný ($P = 0,419$) a koeficient u (zisk/náklady) také není příliš významný ($P = 0,200$). Zejména poslední koeficient dosti překvapuje a je jistým upozorněním na meze užití HPH popř. HDP pro měření ekonomické účinnosti zemědělství.

V další závislosti je závisle proměnná HPH nahrazena ziskem podle souhrnného zemědělského účtu. Závislost má tvar

$$\text{zisk} = -102,017 + 112\,197,3 * (\text{zisk/náklady}) + 6,992086 * (\text{HDP/výměra}) - 71,2485 * (\text{HDP/pracovník})$$

Zisk je opět uváděn v mil. Kč. Ostatní jednotky (rozměry jednotek) jsou stejné jako v předchozích závislostech. Predikční užití tohoto modelu je dosti spolehlivé. Jistým překvapením je, že velký podíl závislosti na sebe bere pouze veličina (zisk/náklady) a že koeficienty u ostatních nezávisle proměnných jsou prakticky nevýznamné. Pro (HDP/výměra) je $P = 0,991$ a pro (HDP/pracovník) je $P = 0,998$. Je tím však poněkud eliminován nepřiznivý dojem pramenící z toho, že úroveň zisku je nepřímo úměrná velikosti produktivity, kdy je spočítán záporný koeficient $-71,2485$.

I když kontrolní propočty vykazují shodu s tendencemi změn (tzn. shodu se skutečností ve kladném či záporném zisku), je shoda v objemech dosažených zisků relativně menší. Přesto však je násobné $R = 0,998$ i zde dosti velké.

Další závisle proměnnou, která měří hospodářský výsledek zemědělství, je jeho čistá přidaná hodnota v nákladech faktorů (ČPH(n.f.) v mil. Kč). V souhrnném zemědělském účtu je definována ČPH(v nákl. faktorů) = HPH (v nákl. faktorů) – odpisy.

Přítom HPH (v nákladech faktorů) = HPH (v tržních cenách) + subvence – daně bez DPH + kompenzace DPH. Daně představují veškeré daně vázané na produkci. Závislost využívá pro měření rentability a intenzity v tomto případě KZP (související jednotky jako výše).

$$\text{ČPH(n.f.)} = 4,939039 + 85,05319 * (\text{zisk/náklady}) + 0,601526 * (\text{KZP/výměra}) + 14,46224 * (\text{KZP/pracovník})$$

Shoda modelu se skutečností je uspokojivá – násobné $R = 0,989$ – to potvrzují kontrolní simulační propočty pro data, ze kterých byla daná závislost odhadována. Také predikční užití podle analýzy rozptylu je možné. Opět však je vliv (KZP/pracovník) málo významný ($P = 0,406$). Vliv intenzity je též nepříliš významný i když větší ($P = 0,299$). Z hlediska celkové modelové struktury je třeba považovat za pozitivní skutečnost, že jsou všechny koeficienty u exogenních proměnných kladné.

V dalším modelu struktury tvorby ČPH v zemědělství je pro konstrukci odpovídajících poměrových nezávisle proměnných užito hrubého domácího produktu vytvořeného v zemědělství (jednotky opět jako výše). Závislost má tvar

$$\text{ČPH(n.f.)} = -15,1952 - 65,7626 * (\text{zisk/náklady}) + 0,866444 * (\text{HDP/výměra}) + 234,1761 * (\text{HDP/pracovník})$$

Tato závislost dává při srovnávacím výpočtu mimořádně dobrou shodu se skutečností, což potvrzuje i úroveň násobného $R = 0,999$. Také analýza rozptylu ukazuje na velmi dobré predikční možnosti. Koeficienty jsou všechny statisticky významné. I relativně nejhorší $P = 0,084$, které patří k testu významnosti proměnné (HDP/výměra), svědčí o přijatelné významnosti tohoto koeficientu. Na druhé straně však záporný koeficient u produktivity upozorňuje na omezení predikčních možností na oblast proměnných blízkou konstrukci oblasti. To znamená, že bude-li počítána závisle (endogenní) proměnná pro hodnoty nezávisle proměnných, které se více liší od hodnot nezávisle proměnných, ze kterých byla tato funkce konstruována, může se dojít v nejhorším případě i k některým nepoužitelným výsledkům.

Doposud se při odhaděch závislosti vycházelo ze souhrnného zemědělského účtu, tak jak je vypracován ve Výzkumném ústavu zemědělské ekonomiky (dále jen VÚZE) v Praze podle jeho publikace ve Zprávách o stavu českého zemědělství. Zde jsou také postupně publikovány i údaje o zisku a nákladech, které jsou počítány bilanční metodou na základě výsledků výběrových šetření VÚZE s využitím některých údajů ČSÚ. Zejména úroveň zisku, která bude pro tento případ značena „zisk(VÚZE)“, se při této metodě zjišťování liší od úrovně podle souhrnného zemědělského účtu a to nejen co do velikosti, ale i co do tendence resp. znamének.

Bylo proto užitečné spočítat ekonometrické modely založené na řadách těchto údajů popř. na smíšených souborech řad, kdy některé vycházely ze souhrnného zemědělského účtu a některé z bilančních metod.

V prvním případě se využilo zisku z bilanční metody a naopak nákladů ze souhrnného zemědělského účtu. Výsledná funkce má tvar:

$$\text{zisk (VÚZE)} = -0,50387 + 101,2403 * (\text{zisk/náklady}) + 0,054897 * (\text{HDP/výměra}) - 0,27594 * (\text{HDP/pracovník})$$

Zisk je v mil. Kč, veličina (zisk/náklady) je bezrozměrné číslo, které vyjadřuje, kolik tis. Kč zisku připadá na 1 Kč nákladů, (HDP/výměra) je v tis. Kč. na ha zemědělské půdy a (HDP/pracovník) představuje, kolik mil. Kč z HDP připadá na 1 pracovníka. Přitom se samozřejmě rozumí, že HDP představuje hrubý domácí produkt vytvořený v zemědělství. Shoda modelu se skutečností je velmi dobrá, násobné $R = 0,9998$, což je opravdu vysoká hodnota. Také analýza rozptylu potvrzuje značné predikční možnosti, ale opět jako v předchozím případě je velmi významný vliv rentability, kdežto u proměnných (HDP/

výměra) je $P = 0,765$ a u produktivity je dokonce $P = 0,983$, což je významnost opravdu malá. To kompenzuje poněkud skutečnost, že je koeficient u proměnné (HDP/pracovník) záporný, současně to však limituje predikční možnosti na oblast nezávisle proměnných blízkou konstrukční oblasti obdobně jako u předchozího modelu.

V dalším modelu se využilo zisku z bilanční metody a nákladů podle počtu VÚZE při užití bilanční metody vycházející především z vlastního výběrového šetření a podkladů ČSÚ. Aby byla zachována stejná délka časové řady, tzn. od roku 1994 do roku 1999, která je nutná nejen vzhledem k požadavku vzájemného srovnání modelových závislostí, ale představuje i jisté věcně logické minimum pro výpočty, bylo nutno stanovit chybějící členy této řady odhadem. VÚZE šetří tyto náklady pro podniky s půdou od roku 1996, pro podniky bez půdy od roku 1998. Celkové náklady pro roky 1996 a 1997 byly odhadnuty poměrovou metodou. Z řady 1996–1999 byly odhadnuty roky 1994 a 1995 různými matematicko-statistickými postupy.

Nejprve bylo využito „zpětné predikce“ pro zmíněné dva roky metodou autoregresní posloupnosti řádu 1. Projekce byla tedy na dva roky dozadu. Při využití takto získané řady nákladů byla odhadnuta tato funkce:

$$\text{zisk(VÚZE)} = -0,17636 + 130,1794 * (\text{zisk/náklady}) + 0,008278 * (\text{HDP/výměra}) + 0,549009 * (\text{HDP/pracovník})$$

Jednotky pro (zisk/náklady) byly stejné jako v předchozím případě, tj. tis. Kč zisku na 1 Kč nákladů. Také ostatní jednotky poměrových ukazatelů jsou stejné jako v předešlé závislosti.

Násobné $R = 0,99998$, což je vynikající výsledek. Shoda se skutečností byla tedy dobrá i predikční využitelnost byla vyhovující. Jako v předchozím případě je statisticky významný koeficient u rentability a u ostatních nezávisle proměnných je významnost malá. P se v obou případech pohybuje kolem 0,9. Uspokojující je, že jsou všechny koeficienty u proměnných kladné. Přesto však je třeba při praktickém užití tohoto modelu jisté opatření, která vyplývá z toho, že jedna z řad potřebných pro určení nezávisle proměnných není celá bezprostředně šetřena, ale je výsledkem jistého odhadu.

To platí i pro další model, který vychází ze zisku a nákladů VÚZE. Náklady pro roky 1994 a 1995 byly odhadnuty metodou řetězových indexů pomocí geometrického průměru řetězových indexů ze známé části řady. Byla získána funkce

$$\text{zisk(VÚZE)} = -0,16984 + 130,5679 * (\text{zisk/náklady}) + 0,004102 * (\text{HDP/výměra}) + 0,728152 * (\text{HDP/pracovník})$$

Přitom se opět rozumí označením HDP hrubý domácí produkt vytvořený v zemědělství. Shoda se skutečností je opět velmi dobrá, násobné $R = 0,99998$, a také predikční schopnost velmi dobře vyhovuje. Jinak platí o celé závislosti to, co bylo napsáno v předchozím případě. Uspokojuje to, že jsou koeficienty u proměnných kladné,

méně příznivé je, že jsou koeficienty u intenzity a produktivity málo významné. Opět se P v těchto dvou případech pohybuje kolem 0,9. Jednotky jsou u všech proměnných stejné jako v předchozím případě.

Další dopočet v řadě nákladů byl proveden tak, že roku 1996 byl dopočten nejprve rok 1995 pomocí řetězového indexu pro celkové náklady právnických osob a z takto doplněné řady 1995–1999 byl autoregresí prvního stupně dopočten rok 1994. Byl získán vztah:

$$\text{zisk}(VÚZE) = -0,69039 + 107,5185 * (\text{zisk/náklady}) + 0,190199 * (\text{HDP/výměra}) - 6,05884 * (\text{HDP/pracovník})$$

Tento model se od předchozího liší jenom způsobem stanovení časové řady nákladů a tak jsou jednotky všech proměnných stejné jako v předchozím případě. Predikční použití je opět možné vzhledem k příznivému výsledku analýzy rozptylu pro celý model. Nejvýznamnější je opět koeficient u proměnné (zisk/náklady), kde $P = 0,0038$, u ostatních nezávisle proměnných je významnost menší, zejména u produktivity – (HDP/pracovník) – kde je $P = 0,762526$. Vzhledem k tomu, že je koeficient u této proměnné záporný, platí opět, že tato proměnná má pouze výpočetní smysl a účel v oblasti blízké konstrukčnímu oboru modelu.

Shoda se skutečností je pro tento model vyhovující, násobné $R = 0,9996$. Také zde jsou jednotky veličin shodné s oběma předchozími případy.

Doposud byly uváděny modely založené na poměrových ukazatelích jako nezávisle (exogenních) proměnných. Byly však také provedeny výpočty vycházejících z absolutních údajů. Jejich výsledky byly při srovnání modelových výpočtů se skutečností výrazně horší a jejich praktická použitelnost je problematická. Ve stručné diskusi bude podán kritický přehled dosažených výsledků.

Při stanovení závislosti zisku (dle SZÚ) na pracovnících, výměře a odpisech byly při kontrolních modelových propočtech získány výsledky, které se nejen lišily od skutečnosti svou velikostí ale v letech 1994 a 1998 i znaménkem. Tím chybí takovému modelu i základní vlastnost orientace v předpokládaných základních dynamických vlastnostech. Ani logaritmická transformace nezávisle proměnných zde nepomohla a vedla v zásadě k obdobným výsledkům. To ostatně plyne i z vlastností monotone odhadované funkce, která je lineární v logaritmické transformaci nezávisle proměnných.

Poněkud lepší je situace, kdy se ekonomický efekt vyjadřuje pomocí hrubé přidané hodnoty (HPH) v zemědělství v mld. Kč. Nezávisle proměnnými jsou opět počet pracovníků (v tis.), výměra (tis. ha) a odpisy (v mil. Kč). Byla spočtena závislost

$$\text{HPH} = 2\,576,139 + 0,125959 * \text{pracovníci} - 0,16358 * \text{výměra} + 0,005723 * \text{odpisy}$$

I když není závislost příliš těsná (násobné $R = 0,8198$ je viditelně menší, než v případě poměrových ukazatelů), jsou přece zachovány základní tendence pohybu HPH,

což znamená, že při kontrolních propočtech skutečné údaje a modelové odhady současně rostou a klesají. Na druhé straně je však test vhodnosti modelu v analýze rozptylu málo významný ($P = 0,449$) a to by mělo vést ke zdrženlivosti v predikčním využití tohoto modelu. Jednotlivé koeficienty u nezávisle proměnných jsou též málo statisticky významné. Poměrně nejlepší je významnost u odpisů ($P = 0,236$), i když ve srovnání s poměrovými ukazateli je to stále málo. U koeficientu pro vliv pracovníků je $P = 0,535$ a nejhorší je $P = 0,684$ pro koeficient odpočítávací výměře.

Obdobné výsledky dává i logaritmická transformace nezávisle proměnných, kdy je získána závislost:

$$\text{HPH} = 17\,332,38 + 33,68239 * \ln(\text{pracovníci}) - 2\,162,15 * \ln(\text{výměra}) + 65,15594 * \ln(\text{odpisy})$$

Přítom označení $\ln(\text{pracovníci})$ znamená přirozený logaritmus z počtu pracovníků v tisících, $\ln(\text{výměra})$ přirozený logaritmus z výměry zemědělské půdy v tis. ha a konečně $\ln(\text{odpisy})$ je přirozený logaritmus odpisů v mil. Kč b.c.

Násobné $R = 0,8467$ ukazuje, že i když došlo k jistému zlepšení, logaritmickou transformací se získalo jen málo. To potvrzuje také analýza rozptylu pro celkový model, kdy se trochu zlepšily predikční možnosti modelu ($P = 0,393$), ale stále zůstávají za predikčními možnostmi při užití poměrových ukazatelů. Zlepšila se významnost koeficientu u odpisů ($P = 0,195$) a u pracovníků ($P = 0,437$). Naopak je velmi málo významný koeficient u výměry, kdy je $P = 0,721$, což odpovídá spíše značné nevýznamnosti. Nárůsty a poklesy jsou stejné u modelu i u skutečnosti. Je zajímavé, že v obou případech vykazují značnou diferenci mezi modelovými výpočty a skutečností roky 1998 a 1999.

Lze tedy konstatovat, že závislosti založené pouze na absolutních ukazatelích mají spíše podpůrný charakter a jejich využití v praxi musí mít relativně značně kritický ráz.

ZÁVĚR

Výsledky této práce nemají pouze noetický a analytický charakter. I když se zde jedná o poměrně jednoduché ekonomicko-matematické modely, skutečnost, že jejich parametry jsou výsledkem statistického odhadu, dává prostor k jejich simulačnímu užití. Výsledky takových výpočtů představují příspěvek k ověření předpokladů o budoucím ekonomickém vývoji a o schopnosti daného systému resp. subsystému reagovat na podněty kvantifikovatelné exogenními faktory. Ekonomické úvahy jsou pak podporovány kvantitativními výsledky, které představují výsledky převodu ekonomických úvah do „modelového“ jazyka.

Důležitou podmínkou praktického využití těchto a podobných modelů je jejich soustavná aktualizace. To znamená provádění nových odhadů modelových parametrů v závislosti na postupném časovém vývoji, se kterým přibývají nové statistické údaje. V jistém slova smyslu se

taková aktualizace již provádí, protože v relativně nedáv-
né minulosti byly modelové odhady struktury tvorby
ekonomického výsledku zemědělství počítány, ale
v menším rozsahu a poměrně nesoustavně. Jisté zkuše-
nosti jsou také s obdobným modelováním v potravinář-
ství (srovnaj práci Linharta a Froňka z roku 1991). I když
v současné situaci se bude při aktualizaci jednat přede-
vším o využití možnosti pracovat s delšími časovými řa-
dami, bude v budoucnu také možné a vhodné posouvat
konstrukční interval v časové řadě tak, že bude dána
menší váha vzdálenější minulosti popř. bude taková mi-
nulost zcela z výpočtu vyřazena. To umožní řešit i tzv.
zlomové situace, kdy v modelovaném úseku ekonomické
reality dochází k zásadním změnám, které se projevují
i významnou změnou modelových parametrů. Zlomům
v časové řadě mohou odpovídat také změny ve statisti-
cké metodice stanovení jednotlivých ukazatelů, kdy vzni-
kají problémy s homogenitou časové řady. V takovém
případě může být převedení údajů na společnou metodi-
ku problematické. Možnosti praktického použití se
v každém případě soustavnou aktualizací samozřejmě
rozšíří zejména s ohledem na bezprostřední použitelnost
získávaných výsledků. Bylo by užitečné, aby se tato prá-
ce stala východiskem pro zmíněnou strukturovanou kon-
tinuální modelovací činnost s jasně určenými možnostmi
aplikace.

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Došlo 27. 12. 2000

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