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THE CZECHOSLOVAK AGRICULTURAL INDUSTRIAL COMPLEX

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The reconstruction of the mechanism of Czechoslovak economy and the changes in economic planning and management tied up with it, introduce a new element into the management system - the formation and development as well as the planning and management of national economic complexes. Long years of experience with centralized branch and departmental planning that constituted the basic structure of the plan and also reflected the organizational management structure of national economy, has shown that the administrative boundaries of the branches and the organizational separation of mutually connected productional entities were one of the reasons for the origin of disproportions in economy, requiring a fastidious coordinative function by the central organs of management.

The rise of hardships in economy, the slow speed of technical development and of adapting the economic structure to the requirements of the economy and the population, call for a new mode of management tied up with a pronounced growth in production elasticity and efficiency. Their solution is embodied in the formation and planning of national economy or inter-branch complexes, among which the agricultural-industrial complex is an important complex providing for nutrition ranks at the top.

Complexes in national economy, in our case the agricultural-food production complex, are the expression of a qualitatively new stage of development of the social division of labour, characterized by the emergence of new and relatively separated economic activities, and also being a manifestation of a change in the significance of the individual areas of economic activities providing for, and implementing, the sale of agricultural and food products. The extension of cooperation between the individual spheres and inside these spheres, along with the increased importance of the supplying branches for agricultural production, lead to the formation of this national-economic complex. At the same time it is also the need of solving problems of

management and planning that calls for the formation of complexes and for strengthening inter-branch coordination in the area of production quality and assortment, production engineering and technology, investments, production finishing and food assortments. The need of uniform management and planned development leads to the formation of national economic complexes.

Complexes may be set up in national economy according to several aspects. These aspects may be such of consumption, production, technology, and other ones. If we accept the aspect of consumption, we speak about the complex of nutrition, housing, health care, the cultural complex, the application of the aspect of production leads to the formation of the machinery-metallurgical complex, the power engineering complex, the transport complex etc.

Their importance in the economy of Czechoslovakia may be expressed by their share in the gross national income that was the following in 1982: the nutrition complex took a share of 21 %, the housing complex a share of 11,2 %, the clothing complex a share of 7.5 %, the health care complex a share of 4,8 %, the complex of cultural needs a share of 18 % in the gross national income.

The agricultural-industrial complex forms part of the inter-branch complex of nutrition. It is made up of the branches and departments of national economy interconnected with production and economic couplings that participate in food production. In terms of the vertical line of food production, the agricultural-industrial complex includes:

- a) branches providing for the production process in agriculture and food industry through the instruments of production,
- b) agricultural primary production,
- c) the processing industry, purchase and supply,
- d) branches serving, by a part of their activities, the interests of agriculture and food production, as well as transport.

The presented demarcation of the agricultural-industrial complex is close to the demarcation used by the COMECON



member countries and differs from the broader interpretation of the content of AIC by not involving the area of services (agricultural research, school system and publishing houses), the area of commerce with foods and public boarding.

Since the management and planning system has so far not made use of the complex approach, but restrict the AIC to an agricultural-food production complex (agricultural primary production and food industry), the economic characteristics of the AIC have been derived from the input-output balance of Czechoslovak economy. The input-output table includes 477 production sectors classified in terms of the modified standard of the UNO Statistic Commission. 52 of them belong to the agricultural-industrial complex with an internal division into branches that embody agricultural primary production, the production of instruments for agriculture and food industry as well as the area of services. The rest of the branches and departments of economy are aggregated into a single branch (see Appendix 1). The Table embodies the input and sale relationships of the agricultural-industrial complex for 1982, the last year of the input-output balance compiled. This balance is set up only once in five years, more recent data will be available as late as in 1987.

## II.

The agricultural-industrial complex and its position within the economy of the Czechoslovak Socialist Republic are characterized by a 21.5 percentage share in the produced gross national income, i.e. the national income produced within this branch amounts to 109.7 thousand million Kčs. Import for the needs of agricultural production represented 11.9 thousand million Kčs, i.e. 8.86 per cent of the sources produced within this branch, and for the needs of the food industry it attained 12.16 thousand million Kčs, i.e. 9.3 % of the sources produced within the food industry. More than 57 % of the production within this complex is consumed by

production and 42.8 % of production were earmarked for final use (personal and public consumption, increment of stocks, investments, export and losses), and thus the agricultural-industrial complex provides for the final use of 26.4 % of production within national economy.

1.585 mil. people were involved in the production process of agricultural-industrial complex (AIC) of the Czechoslovak Socialist Republic in 1982, the basic production funds available amounting to 356.9 thousand million Kčs. The value of the basic production funds is shared by machinery and equipment by 33.5 %. The AIC shares the total number of manpower in national economy by 26.3 %, the volume of basic production funds by 20.4 %. The availability of basic funds for work in the AIC amounts to 225.2 thousands of Kčs per labourer, this being, on average, an availability lower by 22.3 % than within the overall production sphere of Czechoslovak economy in the given year.

In the value structure of domestic production of the agricultural-industrial complex, the highest share is taken by material costs - 72.6 %, depreciations 4.78 %, wages amounted to 13.9 %, profit to 2.7 %, tax to 1.76 %, and the rest of net production to 4.36 %. In comparison with the other branches of national economy, there are some differences in AIC as to the value structure of this complex that follow from the economical mechanism and from the distribution processes of national economy tied up with the purchasing prices of agricultural products and with the prices of victuals. Its material costs are primarily higher by 2.5 %. The share of wage costs in AIC is higher by 0.6 %. The proportion of depreciations is also higher by 1 %, AIC exhibits, in contrast, a lower profit proportion, 2.7 % versus 8.9 % in the entire economy. Tax load in AIC amounts to 1.76 % and matches the load within the entire economy.

Between 1977-1982 the agricultural-industrial complex of Czechoslovakia underwent a development that might be characterized:

- by a slight increase of the proportion of final use in the production volume; within the 1977-1982 period this

- rose by 4 %,
- by the change in the production value structure in which the proportion of material costs rose by 2 %, the proportion of depreciations by 1 %, the proportion of the rest of net production by 5.9 %, and the proportion of profit dropped by 3.7 %,
- by increasing the import claims laid on AIC by 7.5 Kčs per 1000 Kčs of domestic production,
- by reducing the number of employees within the entire complex by 70 thousand persons, the greatest decrement having been registered in agricultural production,
- by a fast growth of the value of basic production funds that rose within the entire AIC by 147 thousand million Kčs. The industry of AIC had the major share in this development, by 72.2 thousand millions Kčs, and agriculture by 65.2 thousand million Kčs.

III.

Between the years 1977-1982 the composition of the branches and departments belonging to the agricultural-industrial complex of Czechoslovakia changed, as shown in Tab. 2

Agricultural-industrial complex of  
Czechoslovakia

Tab. 2

	Domestic prod. in thous.mil.		Basic prod. funds in th.m.		Employees in thousand pers.	
	1977	1982	1977	1982	1977	1982
Agriculture	105.8	123.1	160.5	225.7	1041.2	945.8
Food industry	100.1	125.5	42.1	54.6	202.9	173.9
AIC industry	77.7	93.3	51.8	76.6	413.0	465.4
AIC total	283.6	341.0	254.4	356.9	1657.1	1585.1
Czechoslovak nat.economy	1231.7	1540.4	1287.1	1746.0	6051.0	6019.9

The AIC production structure changed. The dominant change in terms of production is the decline of the share in agricultural production by 1.3 % and the same growth of the proportion of the food industry. From the aspect of the number of employees, the proportion of their number dropped



by 3.1 % in agriculture and by 1.3 % in the food industry, in the branches of industry involved in the AIC it rose by 4.4 %.

In the division of production the following changes were registered in the given period:

- the productional consumption of the branch of agriculture dropped from 27.5 % in 1977 to 25.9 % in 1982. The proportion of deliveries by agriculture to the food industry rose to 47.9 % in this period,
- the intermediate use of the food industry dropped from the proportion of 22 % to 19.7 % in 1982,
- the growth in the share of deliveries by input branches to agriculture from 19.5 % in 1977 to 22.4 % in 1982,
- the growth in the share of the final use of production in agriculture by 1.5 %, in the food industry by 7 %, and within the entire AIC by 1.9 %.

In the structure of the production value of AIC as well as of its particular entities, the following changes occurred:

- the material costs of AIC rose slightly from 65.3 % to 66.8 %. This embodies the growth effect of the proportion of the material costs of agricultural production and the food industry by 2 %, and the growth in the proportion of the material costs of the AIC industry by 4 %,
- the proportion of depreciations rose from 3.5 % in 1977 to 4.4 % in 1982. The greatest rise in the proportion of depreciations was in agriculture, where it grew by 1.5 %,
- the proportion of new value produced in AIC rose to a proportion of 20.8 %,
- the profit rate in AIC dropped in 1982 to the level of 2.5 %.

#### IV.

The position and the task of the AIC of Czechoslovakia are also expressed by the bonds of the other branches of economy to this complex and conversely, by the couplings of the complex with the other branches of national economy. The first group of couplings is expressed with the help of deliveries of the other branches for AIC needs, the second group of



couplings is embodied in form of AIC deliveries covering the needs of the other branches of economy.

In 1982 the deliveries of the agricultural-industrial complex for branches of the economy not included in the complex represented 40.5 thousand million Kčs, i.e. 9.3 per cent out of the total AIC production. The industry involved in AIC shares this volume of production by 76 per cent, the share taken by agriculture and the food industry amounts only to 23.8 per cent.

The other branches and sections supplied AIC in 1982 only with a value of 82 thousand million Kčs, i.e. with 6.3 % of their production total. If we express these deliveries in terms of the AIC production value, then the proportion of the other branches and section of economy amounts to 18.8 per cent, this pointing out the high division of labour and branch specialization, as well as the developed economic linkages of AIC within national economy.

The allocation and distribution of production in the centralized system of planning are rather affected administratively than in terms of the system or by the decisions of those participating in the market. This fact leads to the hypothesis that the structure of AIC inputs, or also of other branches of economy, as well as the distribution of outputs, are more affected by the organizational structure of economy than by productional and technological differences coming from the system. The verification of this hypothesis is particularly actual in mutually comparing the input-output tables of similar complexes of the socialist countries, the input-output tables of West-European countries. The comparing analysis has made it conspicuous that the input structures of the AIC branches are primarily determined technologically, whereas the output structures are predominantly affected by the planning and management system.

From the aspect of comparing the input and output structures of agriculture and food production in the input-output balances of the socialist countries with the inputs and outputs structures of these branches in Czechoslovakia we have examined in how far the technological effect of inputs di-

verges in time, or in how far the dynamic effects of the system make the technological process of agriculture and the food industry balanced in terms of input, or converge in a way that no more pronounced differences occur between similar countries. For empirical analysis we made use of the factor analysis of variance, namely on data of the aggregated input-output tables, covering the period of the years 1970-1983. With the help of the structure of the inputs and outputs of branches, two factors and their interaction were examined. The first was the influence of the branch on the economic system, this being a specific factor acting in the socialist countries, and the second factor bore upon the systems effect of source availability as well as of the mechanism of economy, or the stage of development of the production forces in the respective countries. Their interaction embodies the dynamic structural change and the differences in the structure of inputs and outputs of the individual countries expressed by the coefficient of the temporal difference of the input and output structure of the branches.

The answer to the question whether dynamic systems effects lead to convergence or divergence, calls for setting up groups of countries with the approximately same mechanism of economy, and for estimating the group means of inputs and outputs. Under convergence we subsequently understand the difference of the absolute differences of group averages that declines (or grows) in time as the result of the dynamical effect of the system. The result has shown that it is only agriculture and its structure of outputs which are strongly affected by the system dynamics, the other branches, where this effect was significant, (transport, domestic business, the fuels and power branch) do not belong to the AIC of Czechoslovakia. As far as the conclusion relative to the convergence of the technological structures of the AIC branches is concerned, this appeared to be statistically significant in agriculture, and less significant in the food industry. The branches of industry belonging to the AIC in Czechoslovakia, exhibit very scattered values

though with a high systems effect, thus indicating that their production-delivery couplings are narrowly tied to the needs of agriculture and the food industry.

V.

The agricultural-industrial complex of the Czechoslovak Socialist Republic, the position and significance of which in the economic system we wished to visualize, exerts a high systems and dynamic effect upon the entire economy. It follows from the statistical analysis that the effect is highest as far as its production and its ties with economy are concerned. The input systems effects are not as significant, and hence no strong systems impulses are being transferred into this complex. It belongs to the complexes that stabilizes Czechoslovak economic growth.



Inter-branch balance of the AIC of Czechoslovakia in 1982

In thousand mil. Kčs

Czechoslovakia

Branches	Agri- culture	Productional consumption				Other sectors of NE	Total	Final use	Losses Balance Diff.	Sources total
		Food in- dustry	Indust. fodder	Ind. in- volved in AIC	AIC total					
Agriculture	35024,0	64803,9	8793,9	200,2	108822,0	790,5	109612,5	20575,5	4939,9	135127,9
Food industry	1231,1	27445,2	3982,6	166,5	32825,4	8858,0	41683,4	98187,1	-456,9	139413,6
Industrial fodder	16887,3	13,5	2288,2	16,2	19185,2	53,5	19238,7	21,4	-207,3	19052,8
AIC industry	18867,0	6838,6	1090,5	21271,9	48068,0	30827,7	78895,7	63606,6	-278,6	142223,7
AIC total	72009,4	99101,2	16135,2	21654,8	208900,6	40529,7	249430,3	182390,6	3997,1	435818,0
Other branches of NE	8422,2	17255,2	1038,1	61363,9	82079,4	698663,3	780742,7	508993,6	7009,6	1296745,9
Material costs total	80431,6	140356,4	17173,3	83018,7	290980,0	739193,0	1030173,0	691384,2	11006,7	1732563,9
Depreciations	8433,0	2062,4	257,9	8408,6	19161,9	42621,0	61782,9	-	-	-
Wages and salaries	32236,5	5149,4	494,0	16730,2	55610,1	151584,7	207194,8	-	-	-
Other net production	2742,9	3270,3	112,5	10918,4	17044,1	84769,6	101813,7	-	-	-
Profit, loss	-5523,7	3938,5	400,7	13058,1	10873,6	101940,6	112814,2	-	-	-
Tax	4826,4	700,3	178,8	1369,3	7074,8	19588,5	26663,3	-	-	-
Domestic production	123146,7	15477,6	18617,2	133504,2	400745,7	1139697,1	1540442,8	-	-	-
Import total	11981,4	13036,6	435,6	8719,5	35073,1	157048,7	192121,8	-	-	-
Sources total	135128,1	139414,3	19052,8	142223,7	435818,9	1296745,8	1732564,7	-	-	-

Appendix 2

Classification of the balance of inter-branch relations  
of the AIC of Czechoslovakia in 1982

Line No.	Work area	Area of production	
		Code	Designation
1	Agri- culture	030	Plant production
2		040	Animal production
3	Food in- dustry	762	Sea products and salt water fish
4		764	Slaughterhouse and meat products
5		765	Small farm animal and game animal products
6		771	Fruit and vegetable products
7		781	Nonalcoholic beverages
8		766	Eggs and egg products
9		767	Dairy products
10		755	Industrial vegetable oils, animal fats and their derivatives
11		756	Edible vegetable fats and oils
12		758	Flavours and seasonings, acids and dyes for foodstuff purposes
13		786	Foodstuff concentrates and other finished food
14		787	Ingredients for pastry
15		799	Work of productional character in industry
16		751	Miller's products
17		772	Cereal products
18		773	Baker's wear
19		753	Sugar industry products
20	774	Pastry that keeps well	
21	775	Sweet products	
22	776	Pastry	
23	752	Malt products	
24	782	Brewery products	
25	754	Potato and starch products	
26	757	Alcohol /without synthetic/, yeast and vinegar	
27	783	Vine and mead	

Line No.	Work area	Production area	
		Code	Designation
28		784	Spirits
29		796	Natural and artificial ice
30		788	Tobacco products
31		794	Spring products
32		791	Industrial fodder
33		670	Flax, hemp and treated furs and sources
34	Other AIC branches	941	Purchase operations of agricultural and forestry products
35		942	Sales and supply operations /inclusive of storage economy operations/
36		945	Domestic and foreign trade operations /inclusive of public boarding/
37		432	Refrigerating and freezing devices
38		433	Filling and wrapping machines and package finishing devices
39		526	Machinery and equipment for sugar plants, breweries, malt houses, distilleries, liqueur factories, wine processing, yeast, mildew, acids, vinegar, enzyme productions, fat production, starch factories and potato driers
40		527	Machinery for milk, eggs, cereal and fodder, flour, meat, fish, tobacco processing, chocolate production, sweets production and food conservation
41		551	Wheel and caterpillar tractors
42		532	Parts of agricultural machinery, devices and assembly units
43		535	Agricultural machinery and equipment
44		538	Machinery and equipment for public boarding and sale
45		914	Repair and maintenance of machinery and equipment for the consumption and food industry of Czechoslovakia
46		251	Industrial measures



Line No.	Work area	Production area	
		Code	Designation
47		252	Preparations for plant protection and herbicides
48		263	Preparations for animal production
49		915	Repair and maintenance of tractors, agricultural machinery and equipment
50		610	Wraps
51		410	Structural engineering production
52		221	Power and heat
53			Other branches, sub-branches and production sectors in national economy