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**ANALYSIS OF COMPARATIVE ADVANTAGES IN CZECH
AGRICULTURAL AND FOOD TRADE AFTER THE ACCESSION
TO THE EUROPEAN UNION**

*ANALIZA PRZEWAG KOMPARATYWNYCH W CZESKIM HANDLU
ROLNO-SPOŻYWCZYM PO WEJŚCIU DO UNII EUROPEJSKIEJ*

Key words: comparative advantage, foreign trade, agricultural and food products

Słowa kluczowe: przewaga komparatywna, handel zagraniczny, produkty rolno-spożywcze

Abstract. Almost seven years have passed since Czech Republic joined the European Union. It is not a particularly long period; nevertheless, the first summaries of the accession results can be made. The presented paper carried out analysis and evaluation of the comparative advantages of the Czech Republic in the agriculture and food products trade. The calculations were made using Lafay's indicator. The research shows that the Czech Republic did not take the opportunity which was given by the full liberalization of the trade within the European Union.

Introduction

For Czech Republic and other member states, the accession to the European Union meant abolition of the limitations in trade, including the trade of agricultural products and food. While opening its market, the Czech Republic has also received the chance of selling its products at the developed European market. After almost seven years of functioning in the European structures, some conclusions relating to the competitiveness of Czech products on the common market can be made.

The objective of this paper is to present the chosen development tendencies in Czech agricultural and food trade and the analysis and evaluation of comparative advantages of Czech Republic in the agriculture and food trade after entering the EU. The research focuses on the products belonging to categories 0, 1 and 4 SITC in the years 2003-2010. The three sections include almost all agricultural and food products. The analyses were based on statistical data obtained from the database of foreign trade of the Czech Republic, made accessible by the Czech statistical office.

Overview of the foreign agriculture and food products trade of the Czech Republic

After its accession to the EU, the turnover of agricultural and food products in the international trade of the Czech Republic has increased dramatically. In the years 2003-2010, the export has increased from 1.4 to 3.7 billion EUR, and the import – from 2.1 to 5 billion EUR (Tab. 1). A particularly strong dynamic of growth was observed in the first few years after the accession. In the following years the agriculture and food turnover has still been increasing until 2009, when it decreased due to the world economy crisis.

One of the main criteria of evaluating the results of the foreign trade is the change in the balance of turnover. What is important is not only the value of the exchange and its change in the examined period, but also the level of covering the import by export and the ratio of the turnover balance to export (or, alternatively, total trade turnover).

In the year 2003 the negative balance of the agriculture and food products trade of the Czech Republic was above 0.7 billion EUR. In the following years the trade deficit increased. In 2010 the turnover of the agriculture and food products trade concluded with a deficit of 1.3 billion EUR. In the examined period a slightly higher growth dynamic was present in the export, rather than import, hence the level of covering the import by export increased from almost 67% in 2003 to 74% in 2010.

The dominant role in the Czech agriculture and food products trade is played by EU markets. The Union's share in Czech import and export exceeds 90%. The biggest supplier of agriculture

Table 1. Foreign trade of agricultural and food products in the Czech Republic in the years 2003-2010
Tabela 1. Handel zagraniczny artykułami rolno-spożywczymi w Czechach w latach 2003-2010

Specification/ Wyszczególnienie	Years/Lata							
	2003	2004	2005	2006	2007	2008	2009	2010
Import/Import								
Value [mln EUR]/ Wartość [mln euro]	2 146.88	2 654.53	3 214.11	3 699.27	4 365.45	4 852.45	4 693.25	5 002.42
The preceding year = 100/ Rok poprzedzający = 100	103.70	123.65	121.08	115.09	118.01	111.16	96.72	106.59
Year 2003 = 100/ Rok 2003 = 100	100.00	123.65	149.71	172.31	203.34	226.02	218.61	233.01
Export/Eksport								
Value [mln EUR]/ Wartość [mln euro]	1 432.03	1 755.65	2 417.92	2 572.51	3 161.30	3 767.59	3 481.33	3 712.71
The preceding year = 100/ Rok poprzedzający = 100	108.45	122.60	137.72	106.39	122.89	119.18	92.40	106.65
Year 2003 = 100/ Rok 2003 = 100	100.00	122.60	168.85	179.64	220.76	263.09	243.11	259.26
Balance/Bilans								
Value [mln EUR]/ Wartość [mln euro]	-714.85	-898.89	-796.19	-1 126.77	-1 204.15	-1 084.86	-1 211.92	-1 289.71
The level of covering the import by export [%]/ Poziom pokrycia importu eksportem [%]	66.70	66.14	75.23	69.54	72.42	77.64	74.18	74.22

Source: own study based on Databáze zahraničního...2011

Źródło: opracowanie własne na podstawie Databáze zahraničního...2011

and food products for the Czech market is Germany (25.5% share in 2009), second place is taken by Poland (14.8% in 2009). Czech agriculture and food products are exported mainly to Slovakia (26.4%) and Germany (23.3%) [Pohlová 2011].

The measurement used for evaluating the competitive position of a country is its share in the world trade. A significant role is played by the export side. The Czech Republic's share is not and never was particularly great. In 2007 it was 0.55% in export and 0.72% in import [FAO Statistical Yearbook 2009].

Evaluation of comparative advantages in agriculture and food products trade

A method used very often to evaluate the competitive position of the country in the international trade is the analysis of the level of the revealed comparative advantages. The scientific output in the area of calculating the revealed comparative advantages is significant¹. This paper uses the Lafay formula²:

$$LFI_i = 100 \times \left(\frac{x_i - m_i}{x_i + m_i} - \frac{\sum_{i=1}^N (x_i - m_i)}{\sum_{i=1}^N (x_i + m_i)} \right) \times \frac{(x_i + m_i)}{\sum_{i=1}^N (x_i + m_i)}$$

where:

x_i – export of the product (product category) i ,

m_i – import of the product (product category) i .

¹ In the subject literature, the most known formula for calculating the comparative advantage was proposed by Balassa [1965]. Other methods of measuring comparative advantages are presented by e.g. Hoen, Oosterhaven [2006].

² Lafay's Indicator used in this paper is a modification of the original index, which was made by M. Bugamelli [Marconi, Rolli 2008].

Table 2. Indicators of revealed comparative advantage LFI_i in agriculture and food products trade in the Czech Republic in the years 2003-2010 according to the SITC classification

Tabela 2. Wskaźniki ujawnionej przewagi komparatywnej LFI_i w handlu produktami rolno-spożywczymi Republiki Czeskiej w latach 2003-2010 według klasyfikacji SITC

SITC	Specification/Wyszczególnienie	2003	2004	2005	2006	2007	2008	2009	2010
001	Live animals/Zwierzęta żywe	1.21	2.25	1.99	2.06	1.92	1.80	1.64	1.69
011	Meat of bovine animals, fresh, chilled or frozen/ <i>Mięso wołowe: świeże, schłodzone lub mrożone</i>	-0.01	-0.26	-0.50	-0.47	-0.48	-0.35	-0.46	-0.45
012	Meat and edible meat offal, fresh, chilled or frozen (except meat of bovine animals)/ <i>Mięso i podroby mięsne jadalne, świeże, schłodzone lub mrożone (z wyjątkiem mięsa wołowego)</i>	-0.74	-1.50	-2.53	-2.62	-2.37	-2.97	-3.50	-3.49
016	Meat and edible meat offal salted, dried or smoked/ <i>Mięso i podroby mięsne jadalne, solone, suszone lub wędzone</i>	-0.04	-0.03	-0.03	-0.08	-0.25	-0.17	-0.14	-0.13
017	Meat and edible meat offal, n.e.s./ <i>Mięso i podroby jadalne pozostałe</i>	-0.25	-0.17	-0.03	0.02	-0.13	-0.04	0.16	0.21
022	Milk and cream/Mleko i śmietana	2.41	3.21	3.66	4.49	5.04	4.35	3.69	3.88
023	Butter/Masło	0.74	0.62	0.19	0.28	0.17	-0.01	-0.14	-0.35
024	Cheese and curd/Sery i twarogi	0.08	-0.29	-0.68	-0.75	-0.98	-0.94	-0.96	-0.95
025	Eggs fresh/Świeże jaja	0.27	0.11	-0.02	-0.05	-0.14	-0.16	-0.16	-0.13
034	Fish fresh, chilled or frozen/ <i>Ryby świeże, schłodzone lub mrożone</i>	0.26	0.16	-0.07	0.01	-0.05	-0.20	-0.16	-0.10
035	Fish dried, salted, smoked/ <i>Ryby suszone, solone, wędzone</i>	-0.04	-0.02	-0.04	-0.03	-0.03	-0.02	-0.02	-0.02
036	Crustaceans and molluscs (also in shell), fresh, chilled or frozen/Skorupiaki i mięczaki (również w lupinach), świeże, schłodzone lub mrożone	-0.05	-0.04	-0.05	-0.04	-0.05	-0.04	-0.04	-0.04
037	Fish, crustaceans and molluscs prepared or preserved/Ryby, skorupiaki i mięczaki, preparowane lub konserwowane	-0.65	-0.51	-0.48	-0.46	-0.41	-0.43	-0.38	-0.37
041	Wheat/Pszemica	2.31	0.55	2.92	1.96	2.31	2.29	3.01	2.30
042	Rice/Ryż	-0.22	-0.25	-0.22	-0.24	-0.21	-0.29	-0.22	-0.20
043	Barley, unmilled/Jęczmień niemielony	0.60	0.37	0.98	0.43	0.50	0.36	0.45	0.39
044	Maize/Kukurydza	0.06	-0.07	0.03	0.46	0.22	0.35	0.59	0.28
045	Cereals, unmilled/Zboża, niemielone	0.00	0.06	0.24	0.13	0.15	0.09	0.15	0.13
046	Meal and flour of wheat/Gryś i mąka pszenna	0.07	0.04	0.02	-0.05	-0.08	-0.04	-0.11	-0.07
047	Cereal meals and flours/Gryś i mąka ze zbóż	-0.01	-0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.02
048	Cereal preparations and preparations of flour/Przetwory zbożowe i przetwory z mąki	1.48	1.31	0.29	0.74	0.72	1.03	1.15	1.04
054	Vegetables fresh, chilled or frozen/ <i>Warzywa świeże, schłodzone lub mrożone</i>	-2.59	-2.02	-2.15	-2.34	-2.37	-2.10	-2.11	-2.51
056	Vegetables root and tubers, prepared/Warzywa, korzenie i bulwy przetworzone	-0.75	-0.73	-0.62	-0.60	-0.67	-0.73	-0.67	-0.71
057	Fruit and nuts fresh or dried/ <i>Owoce i orzechy świeże lub suszone</i>	-4.89	-4.01	-3.69	-3.57	-3.16	-3.47	-3.08	-3.10
058	Fruit preserved and fruit preparations/ <i>Owoce konserwowane i przetwory owocowe</i>	-0.53	-0.31	-0.34	-0.44	-0.52	-0.60	-0.53	-0.57
059	Fruit juices and vegetable juices/ <i>Soki owocowe i soki warzywne</i>	-0.16	-0.14	-0.22	-0.23	-0.24	-0.32	-0.24	-0.24
061	Sugar, molasses and honey/Cukier, melasa i miód	0.01	2.39	2.43	1.61	-0.05	0.48	0.23	0.46
062	Sugar confectionery/Wyroby cukiernicze	2.14	2.11	1.25	1.14	0.89	0.94	0.90	0.89

Source: see tab. 1

Źródło: jak w tab. 1

Table 2. Sequel
Tabela 2. Ciąg dalszy

SITC	Specification/Wyszczególnienie	2003	2004	2005	2006	2007	2008	2009	2010
071	Coffee and coffee substitutes/Kawa i jej pochodne	0.17	0.01	-0.10	-0.34	-0.53	-0.72	-0.27	-0.08
072	Cocoa/Kakao	0.11	-0.04	-0.28	-0.24	-0.30	-0.33	-0.30	-0.41
073	Chocolate and other food preparations containing cocoa/Czekolada i inne przetwory spożywcze zawierające kakao	-0.13	-0.35	-0.48	-0.29	-0.16	-0.03	-0.19	-0.15
074	Tea/Herbata	-0.18	-0.16	-0.17	-0.12	-0.17	-0.14	-0.10	-0.10
075	Spices/Przyprawy	-0.08	-0.12	-0.13	-0.12	-0.12	-0.12	-0.13	-0.12
081	Feeding stuff for animals/Pasza dla zwierząt	-2.66	-2.66	-1.70	-1.22	-0.87	-1.14	-1.24	-0.36
091	Margarine and shortening/Margaryna i tłuszcze podobne	0.24	0.32	0.24	0.36	0.46	0.17	0.02	-0.44
098	Edible products and preparations, n.e.s./Produkty i przetwory spożywcze, gdzie indziej niewymienione	0.04	0.18	-0.22	0.19	0.48	0.55	0.62	0.15
111	Non-alcoholic beverages/Napoje bezalkoholowe	0.95	0.38	0.40	0.77	0.88	0.45	0.67	0.57
112	Alcoholic beverages/Napoje alkoholowe	1.55	1.24	0.84	1.05	0.84	0.61	0.59	0.47
121	Tobacco unmanufactured; tobaccorefuse/Nieprzetworzony tytoń, odpady tytoniowe	-0.96	-0.91	-0.69	-0.48	-0.52	-0.38	-0.47	-0.51
122	Tobacco manufactured/Tytoń przetworzony i wyroby	1.81	0.73	0.64	-0.25	0.47	2.66	2.40	2.55
411	Animaloils and fats/Oleje i tłuszcze zwierzęce	-0.21	-0.26	-0.13	-0.07	-0.08	-0.15	-0.10	-0.08
421	Fixed vegetable fats, and oils "soft", crude, refined/Oleje i tłuszcze roślinne surowe rafinowane, miękkie	-0.98	-0.69	-0.05	-0.07	0.33	0.12	-0.59	1.09
422	Fixed vegetable fats, and oils, crude, refined other than "soft"/Oleje i tłuszcze roślinne stałe, surowe rafinowane i inne niż miękkie	-0.47	-0.42	-0.36	-0.29	-0.22	-0.17	-0.19	-0.18
431	Animal or vegetable fats and oils processed/Oleje i tłuszcze zwierzęce i roślinne przetworzone	0.07	-0.09	-0.11	-0.25	-0.22	-0.19	0.24	-0.20

Source: see tab. 1

Źródło: jak w tab. 1

This indicator is based on the import and export streams of a given country and, particularly on the character of the trade turnover balance. If the indicator's value exceeds zero, than the country has a comparative advantage in trading a product or a group of products. A negative value of the indicator reflects the lack of comparative advantage.

While analysis the valued of the LF_i indicator calculated for trade in the years 2003-2010 (Tab. 2) it can be observed that the Czech Republic has a revealed comparative advantage only in relation to a few groups of agriculture and food products. Particularly high advantages occur in the trade of milk and cream ($LF_i = 3.88$ in 2010) and tobacco products ($LF_i = 2.55$). A relatively advantageous situation occurs also in the area of cereal, particularly in the trade of wheat ($LF_i = 2.30$ in 2010). Czech Republic also has an advantage in the trade of live animals ($LF_i = 1.69$). Small relative advantages ($LF_i < 1$) can be found in the product categories such as: sugar, molasses and honey, confectionary, and alcoholic and non-alcoholic beverages. In relation to the group "alcoholic beverages" it needs to be pointed out that the positive level of comparative advantages is an effect of an extremely favourable situation in the beer trade, which export in 2010 was as much as 151.7 million EUR. The trade of high-percentage alcohols shows no comparative advantages. Products of this type generate deficit of 28.5 million EUR (2010).

In the analysed period there were no significant changes in the structure of the revealed comparative advantages. After the accession to the European Union, Czech Republic lost the advantages which it possessed in the pre-accession period in relation to few product groups, such as: butter, margarine, cheese and curd, fresh eggs, fish. Some of the advantages were weakened. Only in one group, unfortunately not very significant one – SITC 017, Czech Republic has gained a comparative advantage.

Analysis of the comparative advantages clearly shows that after the accession to the EU, the Czech food sector did not fully use the opportunity which was given by the full liberalization of the agriculture and food products trade. Accession to the Community revealed most of all the lacks in knowledge of foreign markets conditionings and an insufficient promotion of Czech food on the Union's market. The producers of food products insufficiently used the pre-accession period for improving their products' quality and widening the range of their products [Kraus, Bašek 2009]. The present effects of those abandonments are presently reflected in the weak competitive position of the Czech agriculture and food products sector.

Conclusion

After almost seven years of the Czech Republic's functioning in the structures of the European Union it can be stated that the membership in the EU did not cause an improvement in the foreign trade in the area of agriculture and food products. The carried out analysis shows that products of this type generate trade deficit of almost 1.3 billion EUR.

The analysis of comparative advantages shows that Czech agriculture and food processing industries did not take the opportunity, which was the full liberalization of the agriculture and food products trade in the EU. After accessing the Union, Czech Republic has lost their prior comparative advantages in relation to many processed food products, especially the products of milk and fats industries. Many advantages were weakened. On the other hand, the products in relation to which Czech Republic still possesses revealed comparative advantages are highly resources-demanding and are of low level of processing.

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Streszczenie

Od przystąpienia Republiki Czeskiej do Unii Europejskiej minęło prawie siedem lat. Nie jest to okres zbyt długi, niemniej można dokonywać pierwszych podsumowań wyników akcesji. W artykule dokonano analizy i oceny przewag komparatywnych Czech w handlu towarami rolno-spożywczymi. Do obliczeń wykorzystano wskaźnik Lafay'a. Z przeprowadzonych badań wynika, że Czechy nie wykorzystały szansy jaką dała pełna liberalizacja wymiany handlowej w ramach Wspólnoty.

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