

ANALYSIS OF SUNFLOWER AND OILSEED RAPE COMPETITIVENESS IN THE CONDITIONS OF SLOVAKIA AND CZECH REPUBLIC

Zuzana Bajusová*, Tatiana Bullová

Slovak University of Agriculture in Nitra, Slovak Republic

The paper primarily deals with the development of agriculture in the Slovak Republic and Czech Republic, analyzes the agricultural sector in the period 2012–2022 and examines in more detail agriculture, its plant production, especially oilseeds. Attention is given to brief information on the development and situation of the sunflower and oilseed rape, where we focus on the analysis of the development of selected indicators during the observed period, such as production, area sown, yields. Within our research we deal with the concept of competitiveness, using the appropriate indicators. Based on the data, via analysis we quantified the value of Revealed Comparative Advantage index (RCA) and Competitiveness Growth Index (RCA 1). The development of society and the opening of borders between individual states caused the development of foreign trade. Membership in the European Union meant for Slovak and Czech foreign trade the relinquishment of sovereignty in this areas and the adoption of a common trade policy that establishes rules for foreign trade within member countries, but also towards third countries. At the same time, however, Slovak Republic and Czech Republic gained access to the single internal market, which is of significant importance for foreign trade of countries.

Keywords: competitiveness, agriculture, oilseed rape, sunflower, market

Introduction

The growth in international trade has been quite impressive in the last two-and-a half decades due to falling trade costs and lower trade barriers. The reduction in trade barriers will lead a country towards its comparative advantages; it results in more competitive pressures and the transfer of factors of production, leading to productivity gains from trade (Batra and Khan, 2005). The European Union failed to achieve the objective of the Lisbon strategy to become the most competitive region in the world by 2010. The reasons for the failure to reach this optimistic objective might be different for each of the EU-27 countries and for different economic sectors. The increasing integration of agri-food products in global markets might strengthen competitive pressures for European agri-food sectors leading to declining EU agri-food competitiveness (FoodDrinkEurope, 2012, 2014). The concept of comparative advantage is a cornerstone of economic theory and can be attributed to Ricardo's theory of comparative advantage, generally known as the Ricardian theory which put forward that different productive factors specialize in different economic activities based on their relative productivity differences. According to the Ricardian theory, differences in relative productivity determine the pattern of trade, and then the observable pattern of trade can be used to infer unobservable differences in relative productivity (Danna-Buitrago and Stellan, 2022). Many factors determine export competitiveness. Understanding foreign trade competitiveness changed in the late '90s. Trade theory altered, according to the Krugman hypothesis, in that period, in which emphasis shifted to consumer preferences and economies of scale instead of focusing on comparative advantage, as explained by Ricardo's theory and the Heckscher-Ohlin model. Despite this fact, many economists analyze foreign trade using comparative advantage concept (Travkina and Tvaronavičiene, 2011). The primary factor determining a country's involvement in foreign trade, the natural conditions that the country has. For countries that do not have a sufficient raw material base available, foreign trade is more important than for countries with rich resources of raw materials. For this reason,

foreign trade has for small resource-poor economies a decisive role in the entire economy and determines what the position the country can build in the international division of labor (Rojíček et al., 2016). The issue of competitiveness of Slovak products, including agro-food products on foreign but also the domestic market, and the preservation of the viability of the agrarian sector belongs to permanently current topics. In the current period, the need for an increase is often mentioned food self-sufficiency of Slovakia and also an increase in the share of domestic products in retail stores due to the negative impacts on the manufacturing sector (Matošková et al., 2018).

Material and methods

To define object of research, paper is focused on the analysis and investigation of market development of selected agricultural commodities for the period 2012–2022 namely in Slovakia and Czech Republic. The subject of the analysis are main components of plant production, namely oilseeds, which as agricultural commodities have a significant place on the Slovak and Czech markets, as part of the analysis of rapeseed and sunflower oil seeds. The material for the processing of the scientific contribution are the available data obtained from the statistical databases: Eurostat and Faostat. The analysis resulted in determining the competitive advantage of the monitored agricultural commodities grown in the conditions of Slovak Republic and in the conditions of the Czech Republic based on selected indicators for determining competitiveness. To provide a deep analysis and thus meet the aim of the paper, the method of analysis was used to closely examine the market for agricultural commodities and its development over time. Comparison method was used to compare the markets between selected countries. Graphic representation method, which was used to create graphs and tables using Microsoft Excel and Microsoft Word programs. Mathematical-statistical methods and formulas used for the analysis of market development and the calculation of competitiveness of the country and agro-food trade, such as:

- absolute changes to determine the differences between individual years,
- base index, chain index,
- arithmetic averages to express average values,
- revealed comparative advantage (RCA):

$$\ln \left[\frac{(x/m)}{(X/M)} \right]$$

where: x – commodity export value; m – value of commodity import; X – the value of the country's total agro-food exports; M – the value of the country's total agri-food imports

If:

- $RCA > 0$ indicates that the country has revealed comparative advantages in exporting the given commodity group.
- $RCA < 0$ the country has a comparative disadvantage in the given commodity group.
- $RCA = 0$ is neither a comparative advantage nor a disadvantage.

Competitiveness growth index (RCA 1):

$$\left[\frac{(x_{ij}X_i)}{(X_jX)} \right]$$

where: x_{ij} – export of country “ i ” in commodity group “ j ”; X_i – total export of the country; X_j – world export in commodity group “ j ”; $X...$ – total world export

The equation compares the export rate of a certain country in a given commodity group with the total export share of that country in total world exports. If $RCA1 > 1$, it means that there is an exposed comparative advantage (Dúbravská and Kunová, 2004).

Results and discussion

During the period 2012–2022, oil crops were grown in Slovakia on an average of 260,007 hectares. The highest production of oilseeds in the monitored

period was recorded in Slovakia in 2018, namely 804,580 tons. In the long term, production in Slovakia has a growing character and the value of oilseed production in the Czech Republic is decreasing. Year-to-year production develops in a fluctuating trend, caused by changes in input prices, costs, and also changes in the weather. Because growing crops requires suitable soil, water, sunlight, and heat. For example, a decrease in the amount of precipitation and extreme heat reduce their productivity. Higher temperatures and longer growing seasons allow new crops to be grown, affect the spread of certain types of pests, and so on.

Oilseed rape is one of the most common and most cultivated oil crop in the Czech Republic and Slovakia, despite the fact that it is more demanding to grow. Its seeds are rich in oil, which is obtained by pressing. It can also be used in its pulps, which are high-quality fodder for cattle. It is the most important oil crop in the Czech Republic. The Czech Republic is among the five largest rapeseed growers in Europe.

The following results were achieved in the field of rapeseed cultivation. In Slovakia, the gross production of rapeseed had a clear growing character in the long term. In 2022, gross production was 100% higher than in 2012. We can see the biggest increase right at the beginning of the monitored period. Oilseed growers in Slovakia sowed rapeseed in 2018 on the largest area, i.e. 154,180 hectares. On the opposite side, the smallest area was set aside for rapeseed in 2012, when rapeseed was sown on 106,839 hectares. The change in the area of sown rape in the period 2012–2022 has a growing character. Slovak oilseed growers harvested sunflower production in 2012 from an area of 90,121 hectares, when it reached the highest acreage. In other monitored periods, it decreased and reached the value of 73,360 hectares, which is a decrease compared to the base year. The gross production of sunflower developed in a fluctuating trend, but in the last two years it has increased again, thanks to which the change of the last monitored year 2022 compared to the base year 2012 is also a growth. However, the value is only minimal, meaning growth by 0.05% or 93 tons. The most tons of sunflower were produced in Slovakia in 2016, i.e. 246,496 tons. On the contrary, in 2019, the smallest area was set aside for sowing sunflowers, therefore the gross production also reaches a minimum.

Gross oilseed rape production in our neighbors had a completely opposite development. In the long term, there has been a minimal decline. In 2022, Czech oilseed growers harvested 84,207 tons or rapeseed by 8%

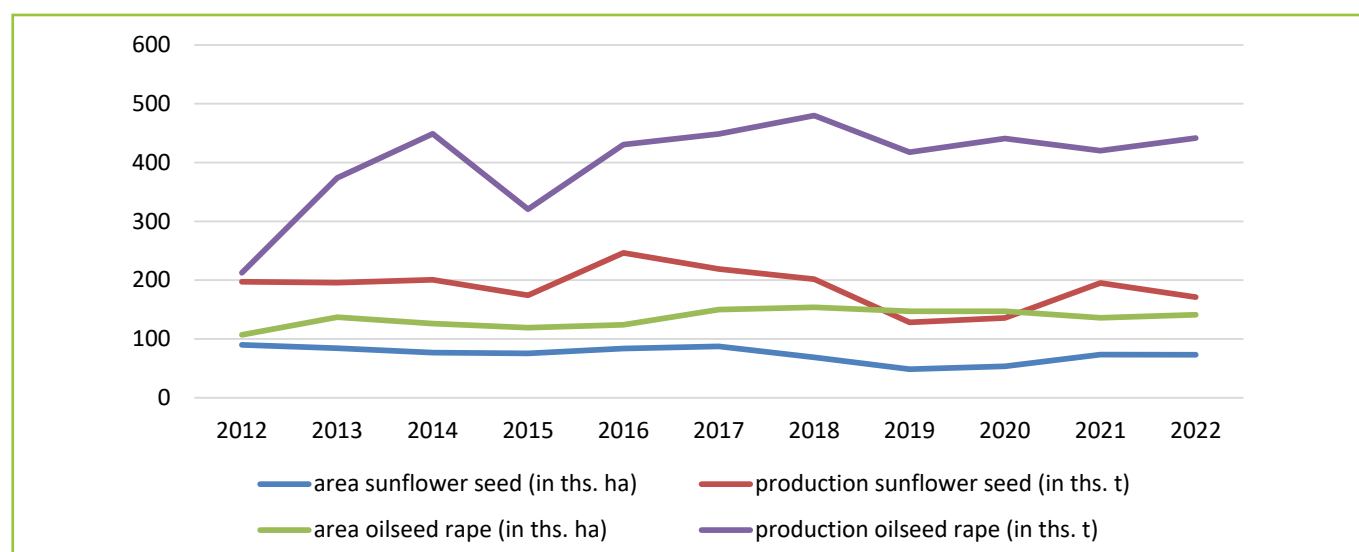


Figure 1 Development of oilseeds in Slovakia 2012–2022

Source: Own processing based on data from Faostat

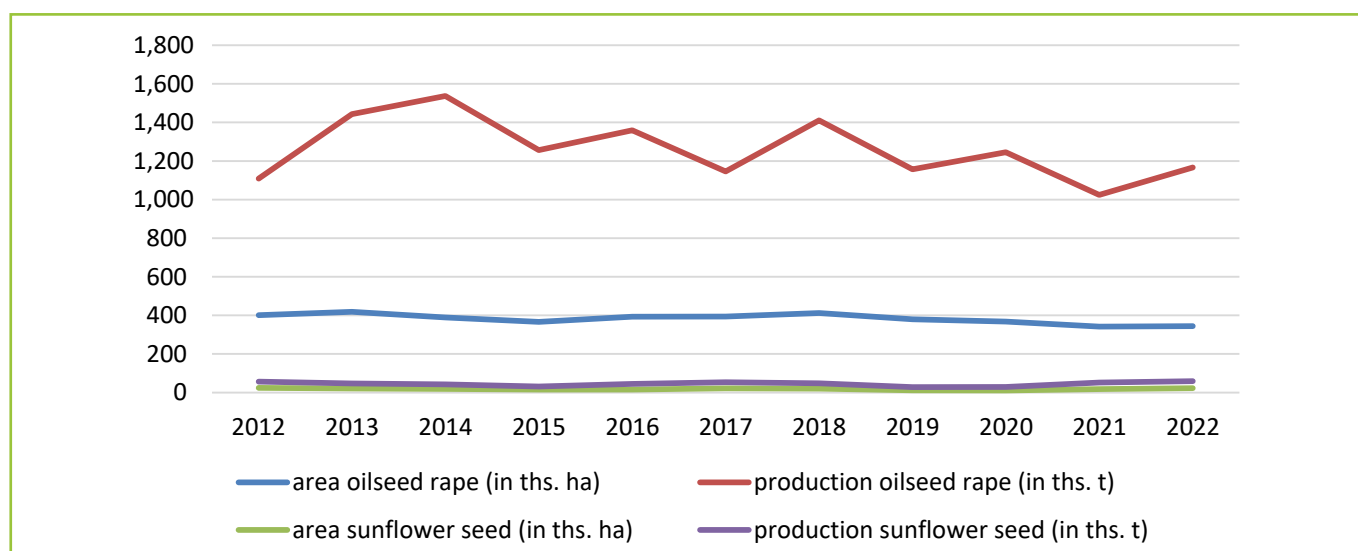


Figure 2 Development of oilseeds in Czech Republic 2012–2022

Source: Own processing based on data from Faostat

less than in the base year of 2012. In the Czech Republic, on the other hand, the area of sown oilseed rape is decreasing. In 2022, it was by 15% or 58,999 hectares less than in 2012. The highest area for rape cultivation in the Czech Republic was set aside in 2013, namely 418,808 hectares. On the contrary, according to the data, the lowest number hectares of rapeseed were in 2022, namely 342,320 hectares.

In the Czech Republic, sunflower is produced almost half less than in Slovakia. In 2022, the Czech Republic produced 59,690 tons of sunflowers, which is 145,200 tons less than in the same year in Slovakia. The overall change in sunflower production in the Czech Republic in 2022 compared to 2012 is decreasing. In the Czech Republic, the sunflower area is also decreasing. In 2022, it decreased from 24,634 hectares to 22,492 hectares.

When analyzing the hectare yields of sunflower and oilseed rape cultivation we can conclude, that there is a fluctuating trend in both countries under analysis. The highest yields of sunflower were recorded in 2016 in Slovakia and in 2021 in Czech Republic. When analyzing the oilseed rape, the best year for Slovak and Czech farmers was 2014.

According to data from the Eurostat database, an average of 112,437 tons of oilseeds were imported into Slovakia during the monitored period. Of this, up to 95% (107,411 t) came from EU countries and only 5.20% from third countries. The value of imports was the highest in 2012 at 165,071,340 euros. In 2021, compared to 2012, the value of imports decreased by 56,361,368 euros. During the monitored period, an average of 619,522 tons of oilseeds were imported into the Czech Republic. The average amount imported from EU countries was 599,372 tons and from third countries 20,150 tons. In financial terms, the maximum import value was recorded in 2021, namely 419,452,413 euros.

In the commodity group of oilseeds, Slovakia clearly has a comparative advantage. The value of the RCA indicator was higher than 0 in the entire observed period. The same cannot be said for the calculations of the RCA index in the Czech Republic. According to the table, we can see that the value of the RCA indicator for sunflower was negative in the period 2013–2022. The Czech Republic has a long-term comparative disadvantage in the sunflower commodity. The value of the indicator was the lowest in 2016, i.e. -1.60,

Table 1 Yield of oilseeds 2012–2022 (in t/ha)

	Slovakia		Czech Republic	
	sunflower seed	oilseed rape	sunflower seed	oilseed rape
2012	2.19	1.99	2.31	2.76
2013	2.33	2.74	2.20	3.45
2014	2.62	3.57	2.27	3.95
2015	2.31	2.69	2.05	3.43
2016	2.94	3.46	2.85	3.46
2017	2.51	2.99	2.46	2.91
2018	2.93	3.11	2.36	3.43
2019	2.64	2.84	2.44	3.05
2020	2.53	3.01	2.58	3.38
2021	2.66	3.09	2.90	2.99
2022	2.33	3.12	2.65	3.39

Source: Own processing based on data from Faostat

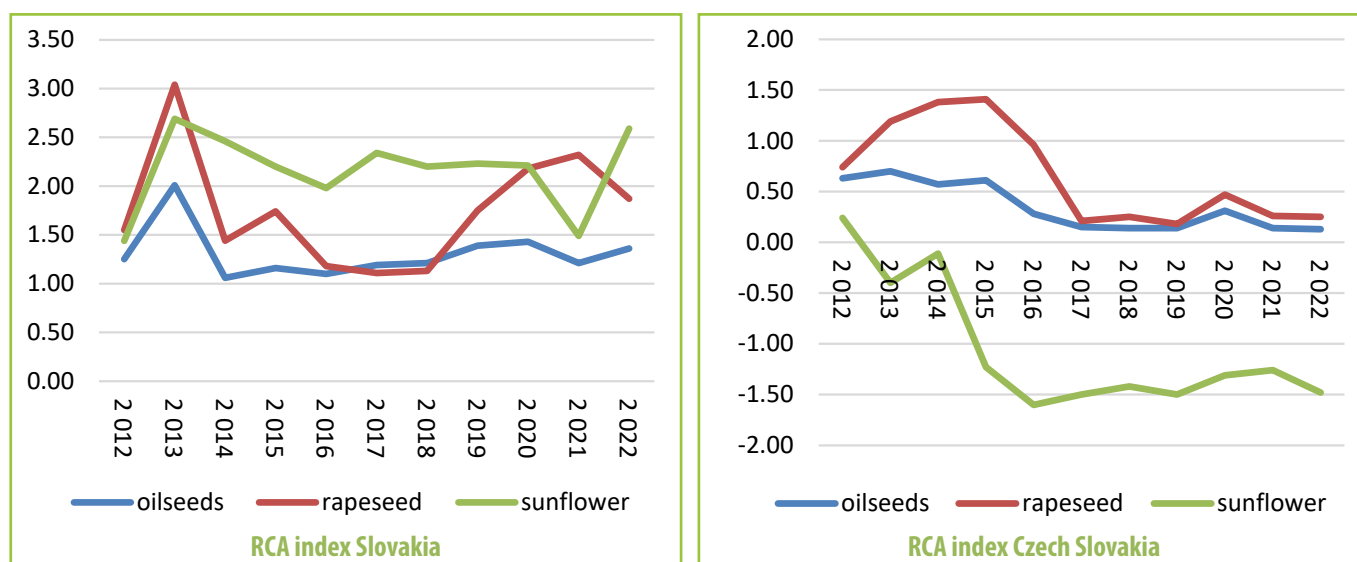


Figure 3 Revealed Comparative Advantage (RCA) index of oilseeds
Source: Own processing based on data from Eurostat

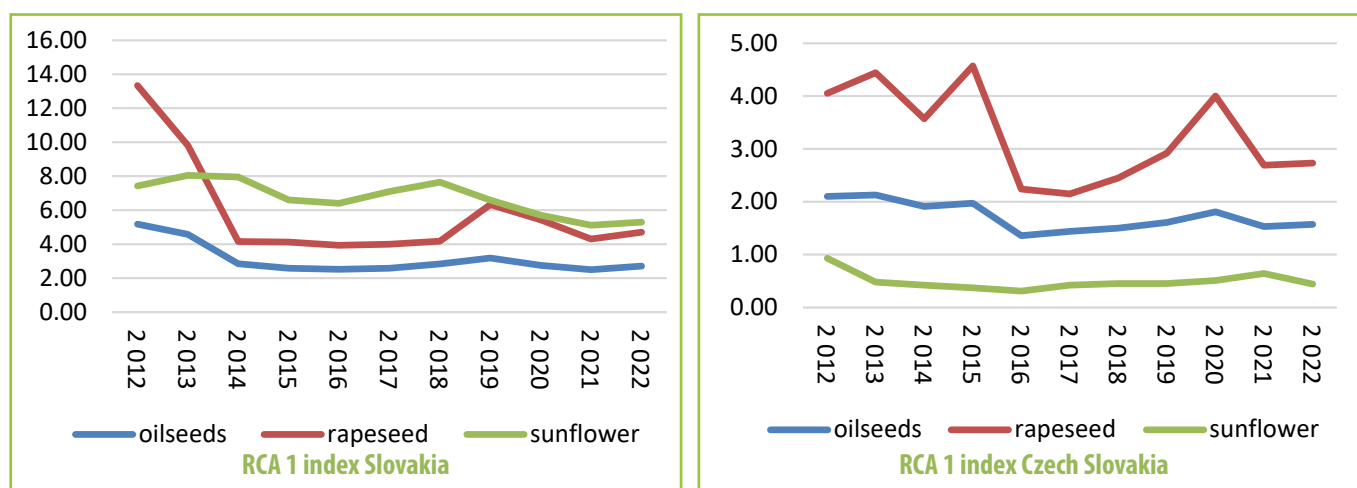


Figure 4 Competitiveness Growth Index (RCA 1) of oilseeds
Source: Own processing based on data from Eurostat

on the contrary, in 2012, it reached a positive value, i.e. 0.24, as the only year within the entire monitored period.

The only disadvantage of the RCA index is that it does not capture the impact of world trade on agrarian trade. Therefore, in order to identify the competitiveness of the country's agro-food trade to the whole world or the selected grouping is more suitable the competitiveness growth index ($RCA - 1$). Since the Slovak Republic and the Czech Republic are among small economies on a global scale, and given the orientation of their foreign agro-food trade towards EU countries, we will use EU data instead of world trade data and thus determine the level of specialization of the Slovak Republic and the Czech Republic within the EU common market.

In the case of the oilseed commodity group, the values for both countries are greater than 1, which means that the country is specialized and comparative advantages are revealed in its export. If we look at specific commodities, the Slovak Republic is specialized in the case of oilseed rape and sunflower. Czech Republic only in the case of rapeseed. When exporting sunflower, the Czech Republic does not show comparative advantages, so the country is not specialized in the given commodity.

Conclusion

Foreign trade in agricultural commodities is important above all for countries in which agricultural products make up the largest share of exports and cannot replace their products from another industry, or they can produce agrarian commodities at lower costs as foreign countries and therefore achieve comparative advantages with them. Agricultural export of the commodity also helps stimulate a wide range of businesses connected to agriculture, including farmers and companies providing transportation of commodities. Foreign agrarian trade is important from an import point of view in cases where the country cannot satisfy the demand for agrarian commodities from its own production as a result climatic conditions or insufficient production capacities.

Production of oilseed rape and sunflower has been significantly influenced by the legislation on compulsory component of transportation fuels. Situation on the individual market that perform trade surpluses with oilseed products indicates certain level of comparative advantage. Based on the RCA index values, we can say that Slovakia has a comparative advantage

in case of oilseed rape and also sunflower. On the contrary, Czech Republic situation with sunflower seeds do not show comparative advantage within the monitored period.

References

- Batra, A. – Khan, Z. 2005. Revealed comparative advantage: An analysis for India and China. New Delhi : ICRIER, ICRIER Working paper, no. 168, 2005, pp. 1–53.
- Danna-Buitrago, J.P. – Stellan R. 2022. A New Class of Revealed Comparative Advantage Indexes. In *Open Economies Review*, 2022, no. 33, pp. 477–503.
<https://doi.org/10.1007/s11079-021-09636-4>
- Dúbravská, R. – Kunová, D. 2004. Hodnotenie efektívnosti obchodu s jablkami v Slovenskej republike. [online]. Available at: <https://kipdf.com/hodnotenie-efektivnosti-obchodu-s-jablkami-v-slovenskej-republike-evaluation-of-5ab32b601723dd339c80bb81.html>
- EUROSTAT. 2024. Ec.europa.eu (Database). Available at: <https://ec.europa.eu/eurostat>
- FAOSTAT. 2023. Fao.org (Database). Available at: <https://www.fao.org/faostat/en/>
- FoodDrinkEurope. 2012. Priorities for the development of an EU industrial policy for food – competitiveness report 2012. Brussels : FoodDrinkEurope, 2012.
- FoodDrinkEurope. 2014. Promoting an EU industrial policy for food and drink – competitivenessreport 2013– 2014. Brussels : FoodDrinkEurope, 2014.

Matošková, D. – Gálik, J. – Jamborová, M. 2018. Vybrané aspekty konkurencieschopnosti v dodávateľsko-odberateľskom reťazci agropotravinárskych komodít. Bratislava : Research Institute of Agricultural and Food Economics, 2018, 168 p. ISBN 978-80-8058-623-2

Rojíček, M. et al. 2016. Makroekonomická analýza: teorie a praxe. Praha : Grada publishing, 2016. 543 p. ISBN 978-80-247-5858-9

Travkina, I. – Tvaronavičiene, M. 2011. Export Competitiveness and Domestic Productivity Facets : Case of Lithuania. In *J. Bus. Econ. Manag.*, 2011, no. 12, pp. 49–68.

Contact address

Zuzana Bajusová
Slovak University of Agriculture in Nitra, Faculty of Economics
and Management, Institute of Economics and Management
Tr. Andreja Hlinku 2, 949 76 Nitra, Slovakia
✉ zuzana.bajusova@uniag.sk

