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STATUS OF CATTLE AND BEEF EXTERNAL TRADE OF POLAND AND HUNGARY OUTSIDE THE EUROPEAN UNION BETWEEN 2002 AND 2015

STAN POLSKIEGO I WĘGIERSKIEGO HANDLU ZAGRANICZNEGO BYDŁEM I WOŁOWINĄ POZA UNIĘ EUROPEJSKĄ W LATACH 2002 I 2005

Key words: cattle trade, beef trade, export to third countries, comparative advantages and disadvantages

Słowa kluczowe: handel bydłem, handel wołowiną, eksport do krajów trzecich, relatywne korzyści i wady

JEL codes: P51, Q17

Abstract. Both Hungary and Poland are net exporter in cattle and beef trade. Because of the large Polish and Hungarian supply these countries cannot sell all products on domestic and EU single markets. Cattle and beef production of both countries have to be sold on non-EU markets. These markets have a special attribute because import of cattle and beef to EU is regulated but the export to these countries is not under European limitation. This special attribute results in the fact that there are less available scientific indexes to use studying the international trade. In this paper we aimed to examine the comparative advantages of Hungarian and Polish cattle and beef export to non-EU markets between 2002 and 2015. Our analysis based primary on Balassa index (RCA) which is compared with the share of product export of the reference countries in their entire export. Secondary, the Revealed Symmetric Comparative Advantage (RSCA) was used as a correction of RCA (makes the RCA symmetrical). Primary we established that both studied countries have the same non-EU target markets with the highest importance of Turkey and Russia. During the examined period several changes were resulted, for example the decrease of Turkish market and the Russian embargo. These changes had an effect on comparative advantages.

Introduction

The membership of the European Union since 2004 has been presented as an outstanding opportunity not only to Hungary but also to all East-Central European countries: beef cattle husbandry was the mostly supported sector by the Union. Almost all impact studies done during the negotiation phase of the EU accession gave a positive opinion about the expected effects.

The investigation of the effects of the EU expansion is still an important issue, since problems resulted by the adoption of the subsidy system and the competitiveness of agriculture have still had a lasting effect even today. Negotiations, however, have not been concluded with the EU accession; those working in agriculture still have to continuously follow the changes of the agrarian system of the EU. Being up to date is of utmost importance in order to be able to take advantage of arising opportunities so that competitiveness can grow [Zalai-Mészáros 2016].

The notion of competitiveness, as summarised by David P. Rapkin and William P. Avery [1995] is: “the competitiveness of a nation is the benchmark which shows to what extent it is able to create marketable products and services for the world market under perfect terms of competition (...)”. Thus, it is always connected to some kind of economic performance. Reaching the competitive edge is never to the disadvantage of another country, but it is the development of a country compared to its previous state [Lengyel 2003]. In this paper, we have conducted the competitiveness investigations on the level of countries, namely on a macro-level, more specifically by using ex post type indices.

Both Hungary and Poland are members of Visegrad Countries (V4) accompanied by Czech Republic and Slovakia from 1991. This cooperation aims to promote collective economic interest and to improve international trade-ability emphasis on eastern markets [Réti 2000]. Beside this Visegrad Group also proposed to improve regional economic power and regional cooperation, to consolidate the financial stability, to offset negative trade-effect of EU-conventions and to prepare convention process for member countries [Kiss 2000].

The Hungarian and Polish agricultural area are different resulted by different country-sizes. Despite the share of agricultural production gives 3.7% of total GDP in Hungary and 3.4% in Poland. There are also differences in the structures of agricultural holdings which is issued by the country-specificities [Osztrogonác, Vásáry 2007]. Poland has the largest territory within V4 countries and additionally also has the largest pasture-area [Takács-György et al. 2008], which amounts more than 3 million hectares. This area is approximately 10% of Poland and 50% of total Polish agricultural areas [Wigier 2014]. In Hungary pasture land amounted 761 thousand hectares and were continuously decreased during examined period. This value gives only 8% of country area and 14% of total agricultural area [Dohy 1999]. Both Hungarian and Polish total agricultural and grassland area had been decreased continuously during examined period. The rate of decreasing was 20% for total agricultural area in both countries but 34% and 23% for grasslands in Hungary and in Poland between 2002 and 2014.

The weight of animal husbandry was 35.4% (Hungary) and 43.5% (Poland) in gross agricultural output in 2011. In Poland after the EU accession the cattle livestock decreased from more than 6 million (1999) to 5.66 million (2014). Within this process the decreasing of dairy livestock was high and beef cattle livestock could increase because of the higher profitability [Potori et al. 2014]. In Hungary a decreasing trend was perceptible from 2002 to 2011 by livestock there, and it turned to increase from 2012 to 2014. The livestock unit was about 800 thousand both at the begin and at the end of demonstrated period [EUROSTAT 2016].

Figure 1 shows Hungarian and Polish non-EU cattle and beef export in proportion to total cattle and beef export. Figure indicates that Hungary sold cattle and beef on non-EU markets in a higher degree than Poland. The external trade to outside of the EU were most dominant between 2010 and 2012 for both countries and in 2015 for Hungary. In case of Hungary mainly Turkish markets shown an increasing interest in these years which may be caused by the excellent Hungarian animal health status [Szabó 2012].

In case of Hungarian cattle and beef trade Croatia was a permanent target country with a high market capacity in the whole period. Oppositely Turkey was the main non-EU export partner between 2010 and 2012 and in 2015. Cattle export to Russia and Belarus were significant between 2010 and 2012, as well as between 2013 and 2014 to Azerbaijan. Both cattle and beef export were permanent to Ukraine. The Polish beef export could be founded permanently on

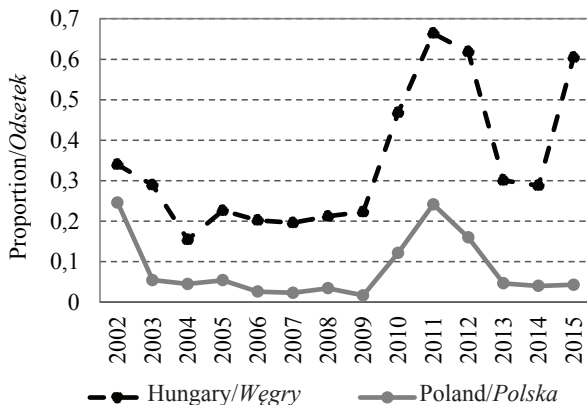


Figure 1. Hungarian and Polish non-EU cattle and beef export in proportion to total cattle and beef export between 2002 and 2015

Rysunek 1. Węgierski i polski eksport pozaeuropejski bydła i mięsa wołowego w stosunku do całkowitego eksportu bydła i wołowiny w latach 2002 i 2015
Source/Źródło: [EUROSTAT 2017]

Russian and Croatian market in whole period. Additionally large volume of beef was exported to Belarus and Ukraine until 2010 and large volume of cattle was sold in Ukraine after 2011 and in Turkey between 2010 and 2012 and in 2015. The demand on Polish beef was low but periodic in Azerbaijan and Albania [Mészáros, Lencsés 2016].

Material and methods

The database of the Eurostat takes the SITC (5-digit) categories (used by the UNO) for the basis of investigation of foreign trade. The main focus of our research was on cattle trade within the category of live animal trade, in addition, on the trade of beef within the category of refrigerated and frozen goods trade. Data contain trade of cattle and beef only which were sold for slaughter crossing borders, irrespective of whether it was beef cattle or the by-product of dairy industry. In the database, import is on cif parity, export is on fob parity¹

Upon the expansion of the European Union in 2004, the interpretation of certain aspects of foreign trade changed for the V4 countries. Markets of the member states can be divided not only into domestic and external (third country) markets but also internal EU markets can be put into a distinct group. The reliability of the data queue falls short of that of data before 2004, since firms engaged in foreign trade declare the exported and imported quantities on a voluntary basis. In contrast, sales turnover crossing borders was registered by customs authorities before 2004 [König 2007].

There is a low number of practicable indexes to examine non-EU target markets because neither Hungary nor Poland import any cattle or beef from these countries. The method for the analysis of comparative advantage was first published by Béla Balassa in 1965 (*RCA* – Balassa-index), which was later applied in several studies [Vollrath 1991, Laursen 1998, Fertő, Hubbard 2001, Jámor 2009, Zalai-Mészáros 2016].

The essence of this method is that the share of product export of a given country is examined in the entire export of the given country, which is compared with the share of product export of the reference countries in their entire export.

$$RCA_{ij} = \frac{\frac{EX_{ij}}{EX_t}}{\frac{EX_{nj}}{EX_n}}$$

where: *EX* – export, *i* – *i*-country, *j* – *j*-commodity, *n* – countries of EU-27, *t* – all commodities

If the *RCA* takes a greater value than 1, the examined countries have a comparative advantage in the given product. If the value is below 1, then we talk about comparative disadvantage. According to Ádám Török [1996], an *RCA* value greater than 1 indicates only a quasi comparative advantage, since the country exports more of product *j* than expected. Dany Bahar et al. [2012] also agree that the Balassa index only shows that a given country exports more (*RCA* > 1) or less (*RCA* < 1) of product *j* to the market under investigation compared to the reference countries.

The index has been widely criticized due to its asymmetrical values [Fertő 2003] but Jeoren Hinloopen and Charles van Marrewjik [2001] developed a method which makes the index symmetrical. However, in my dissertation, I applied the index, whereby Keld Laursen [1998] provided a correction which makes the index symmetrical: I used the *RSCA*, or Revealed Symmetric Comparative Advantage.

$$RSCA = \frac{RCA - 1}{RCA + 1}$$

¹ 1 Cif: the market value of imported goods on the customs border of the importing country, including all incurred freight costs to the customs border, and the insurance costs during transportation. Fob: the market value of exported goods on the customs border of the exporting country including incurred costs of transportation and insurance of goods to the customs border.

The value of *RSCA* ranges from -1 to 1. The interpretation of the index is the following: if the *RSCA* is positive, the country has revealed comparative advantage in that product, if the value is negative, then it has a comparative disadvantage in the given product.

Based on this, Thomas Vollrath [1991] created the logarithm of relative export advantage ($\ln RXA$, $RXA = RCA$), which was used for the analysis of international competitiveness of agriculture. With the help of the logarithm, the index assumes a symmetrical value to the x-axis. T. Vollrath corrected the asymmetrical “defect” of the index developed by B. Balassa. The afore-mentioned indices indicate competitive advantage in case of a positive value, whereas in case of a negative value they indicate a competitive disadvantage.

Results

Regarding beef trade and the meat market of living and slaughtered animals in total, only Hungary had a detectable comparative advantage based on the *RSCA* index only in the year of 2011 (fig. 2). The values of the indexes of the two countries is similar. Before the EU connection the values decreased and stayed low till 2009. From 2010 the demand of third countries, especially Turkey, had increased. The export of live beef cattle was high from 2010 to 2012 both from Hungary and Poland there. Despite this the Balassa index values was not show comparative advantage – only 2011 in Hungary – because the rate of cattle and beef products are low in the full export of the examined countries.

The Figure 3 shows the values of symmetrical *RCA* indexes as *RSCA* and $\ln RXA$. The $\ln RXA$ index shows larger amplitude in case of Poland. The reason of this amplitude is the increasing of cattle and beef export in 2005 (to Croatia) and in 2008 (to Russia).

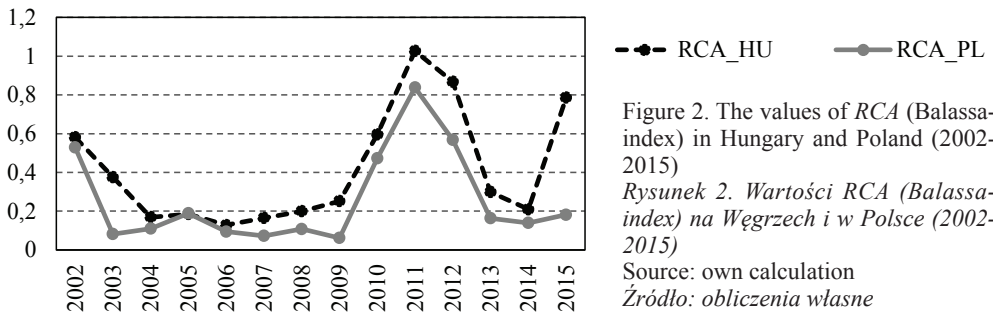


Figure 2. The values of *RCA* (Balassa-index) in Hungary and Poland (2002-2015)
 Rysunek 2. Wartości *RCA* (Balassa-index) na Węgrzech i w Polsce (2002-2015)
 Source: own calculation
 Źródło: obliczenia własne

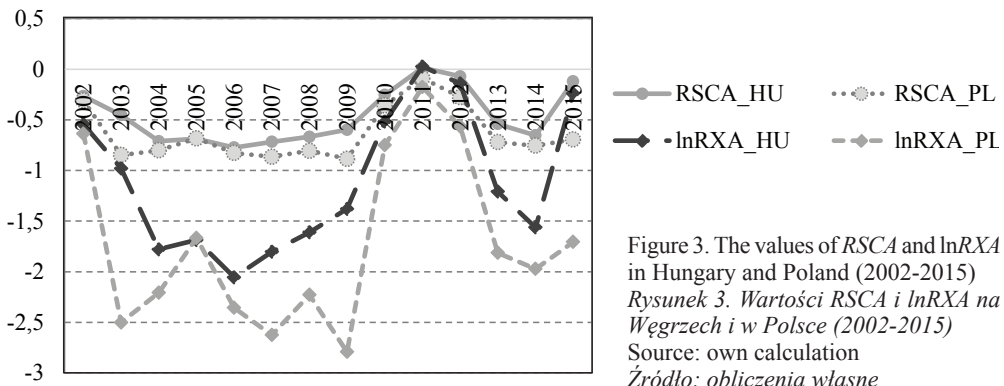


Figure 3. The values of *RSCA* and $\ln RXA$ in Hungary and Poland (2002-2015)
 Rysunek 3. Wartości *RSCA* i $\ln RXA$ na Węgrzech i w Polsce (2002-2015)
 Source: own calculation
 Źródło: obliczenia własne

Table 1. Statistical description of the RCA, RSCA and lnRXA indexes

Tabela 1. Opis statystyczny indeksów RCA, RSCA i lnRXA

Specification/ Wyszczególnienie	RCA		RSCA		lnRXA	
	Hungary/ Węgry	Poland/ Polska	Hungary/ Węgry	Poland/ Polska	Hungary/ Węgry	Poland/ Polska
Average/Średnia	0.42	0.26	-0.46	-0.64	-1.11	-1.71
Median/Mediana	0.28	0.15	-0.57	-0.74	-1.29	-1.89
Deviation/Odchylenie	0.30	0.24	0.27	0.26	0.70	0.85
Minimum/Minimum	0.13 (2006)	0.06 (2009)	-0.77 (2006)	-0.88 (2009)	-2.06 (2006)	-2.79 (2009)
Maximum/Maksimum	1.03 (2011)	0.84 (2011)	0.01 (2011)	-0.09 (2011)	0.03 (2011)	-0.18 (2011)

Source: own calculation

Źródło: obliczenia własne

In the case of Hungary 2006 is the year of lowest value. The export to Croatia was lower than in the other years and the export to the other third countries are not considerable.

As we could also see in the Table 1 by high deviation, the largest amplitude is belong to the lnRXA in the case of Poland. Oppositely, the values of RSCA have the smallest standard deviation. The difference between the average and median is the smallest at lnRXA and the largest is the RCA. The cause of this is derived the asymmetric quality of RCA.

Conclusions

The examination shows there are comparative disadvantage in the export of beef and cattle beef of Poland and Hungary in the market of non EU members. The exception is Hungary in 2011 where the index shows minimal comparative advantage. This temporal advantage occurred due to the overriding Turkish import that ordinary was highly important in the whole export of both Poland and Hungary.

Low values indicate a low rate of cattle and beef trade within the full export to third countries.

Comparing used indexes we can see the following methodical conclusions. The asymmetric character of RCA makes difficult to explain the results, mainly the level of advantage or disadvantage. Both RSCA and lnRXA are symmetric but lnRXA is more sensitive for changes. This sensitiveness is confirmed by the statistical description, too: the lnRXA has the largest deviation of the tree indexes.

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Streszczenie

Celem artykułu jest określenie przewag komparatywnych dla eksportu bydła i mięsa wołowego z Polski i Węgier poza jednolity rynek Unii Europejskiej w latach 2002-2015. Analizę oparto na wskaźniku Balassa (RCA) porównywanym z eksportem krajów odniesienia w całości eksportu. Obliczono także symetryczne przewagi komparatywne (RSCA). W wyniku analiz stwierdzono, że oba kraje mają takie same rynki docelowe spoza UE. Największe znaczenia miały Turcja i Rosja. W badanym okresie wystąpiło kilka zmian, np. spadek eksportu do Turcji oraz wprowadzone embarga, miały one wpływ na powstanie przewag komparatywnych.

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