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Comparative advantages in agro-food trade of Hungary, Croatia and Slovenia with the European Union

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DISCUSSION PAPER

**Leibniz Institute of Agricultural Development
in Central and Eastern Europe**

**COMPARATIVE ADVANTAGES IN AGRO-FOOD
TRADE OF HUNGARY, CROATIA AND SLOVENIA
WITH THE EUROPEAN UNION**

ŠTEFAN BOJNEC, IMRE FERTŐ

**DISCUSSION PAPER No. 106
2007**



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ABSTRACT

This paper investigates comparative trade advantages in agro-food trade. We analyze comparative advantages of Hungarian, Croatian and Slovenian agro-food trade in the European Union (EU) markets. Both the levels and pattern of the revealed comparative advantage measure are investigated. The empirical research seeks to explain how revealed comparative advantages have developed across countries, main product groups and over time and what are likely their implications for multifunctional rural development in the enlarged EU. We employ a disaggregated trade dataset to identify the revealed comparative advantages to provide broader policy implications. The empirical results confirmed bulk of agro-food and forestry products with revealed comparative advantages in the EU markets for Hungary and to a lesser extent for Croatia, but have not identified any such aggregated agro-food product group for Slovenia. Yet, also Hungary and Croatia have faced difficulties in comparative trade advantages in consumer-ready foods and processed intermediaries. Agro-food sectors in Hungary are likely to continue to have a significant role in the Hungarian and to a lesser extent in Croatian rural areas, but employment and income activities are more likely to be combined with other more rapidly growing service activities. In Slovenia, traditional agro-food activities under increasing competitive pressures are more likely to shrink.

JEL: F14, Q17

Keywords: Comparative advantage, Croatia, Hungary, Slovenia.

ZUSAMMENFASSUNG

KOMPARATIVE VORTEILE UNGARNS, KROATIENS UND SLOWENIENS IM HANDEL VON AGRAR- UND ERNÄHRUNGSGÜTERN MIT DER EUROPÄISCHEN UNION

Diese Arbeit untersucht komparative Vorteile im Agrar- und Lebensmittelhandel, wobei speziell relative Überlegenheiten des ungarischen, kroatischen und slowenischen Handels auf den Märkten der Europäischen Union analysiert werden. Dabei interessiert bei der Untersuchung das Niveau, aber auch die Struktur, des jeweils ermittelten komparativen Vorteils. Die empirische Studie versucht zu erklären, wie relative Überlegenheiten zwischen Ländern, wichtigen Produktklassen und im Zeitablauf entstehen konnten und welche Schlussfolgerungen sich daraus für eine multifunktionale ländliche Entwicklung in der erweiterten EU ziehen lassen. Wir verwenden für die Identifikation der komparativen Vorteile einen nicht aggregierten Handelsdatensatz, um umfassendere politische Implikationen zu erfassen. Die empirischen Ergebnisse belegen für eine Gruppe von land- und forstwirtschaftlichen Produkten aus Ungarn offensichtliche komparative Vorteile in den Märkten der EU, und in geringerem Ausmaß auch für Produkte aus Kroatien. Gleichzeitig konnte eine solche Gruppe von Erzeugnissen nicht für Slowenien festgestellt werden. Dennoch sahen sich auch Ungarn und Kroatien im Hinblick auf einen komparativen Vorteil bei End- und Zwischenprodukten Schwierigkeiten gegenüber. Der Agrar- und Ernährungssektor wird auch in Zukunft eine wichtige Rolle in ländlich geprägten Regionen Ungarns und, in geringerem Ausmaß, Kroatiens, spielen, dennoch werden Beschäftigung und Einkommen wahrscheinlich auch durch die schnell wachsende Serviceindustrie unterstützt. In Slowenien kann man dagegen vermuten, dass der traditionellen Agro-food Sektor durch steigende Konkurrenz schrumpfen wird.

JEL: F14, Q17

Schlüsselwörter: Komparativer Vorteil, Kroatien, Ungarn, Slowenien.

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1 INTRODUCTION

A broad range of theoretical concepts is available to explain international trade in agro-food products. Recent empirical studies have highlighted two basic features in agro-food trade. First, the role of processed and manufactured food products has increased at the expense of raw and bulky agricultural products. Second, similarly as other trade, agro-food trade is increasingly of an intra-industry trade nature meaning that similar products are exported and imported at the same time. The reasons in behind are utilisation of economies of scale from specialization of production and consumer preferences for varieties caused by household's real income growth.

Although there is much research about various aspects of agro-food trade, there is a little research available focusing on interlinks between agricultural and food as well as forestry trade on one side and multifunctional and sustainable rural development on the other. We are interested in to investigate how trade and particularly revealed comparative advantages in agro-food trade might affect rural development in Hungary, Croatia and Slovenia within the enlarged European Union (EU).

The paper contributes to the existing literature in at least three significant directions. Firstly, the paper contributes to a better understanding of the revealed comparative advantages of Hungarian, Croatian and Slovenian agro-food trade, employing BALASSA (1965) revealed comparative advantage index. This index measures comparative advantages of a certain products or a product group in exports vis-à-vis other exported products to the same markets. Secondly, a certain country at the same time might exports and imports and hence some country might not be competitive in exports, but might be still efficient and competitive in import penetration. Therefore, the paper applies in empirical work recent theoretical and methodological developments in international trade literature employing besides revealed comparative export advantage index also import penetration index and trade comparative advantage index (VOLLRATH, 1991; EITELJÖRGE and HARTMANN, 1999; BOJNEC, 2001; FERTŐ and HUBBARD, 2003). Thirdly, on these bases the paper provides an insight of the level and dynamics in revealed comparative advantage, import penetration and trade advantage indices for agro-food trade of Hungary, Croatia and Slovenia using the EU-15 as the benchmark of comparison. Finally, we explain how these trade developments have developed and indicate ways how they are likely to develop in the future and how this might influence magnitude and directions in multifunctional rural development especially in the enlarged EU. Therefore, the results may also be of broader relevance to those with a direct involvement in commercial trading and to policy makers in rural development programming.

2 METHODOLOGY

The nature of comparative trade advantages is investigated employing the concept of 'revealed' comparative advantage, introduced by Liesner (1958) but refined and popularized by BALASSA (1965). Therefore, the methodological approach is known as the 'Balassa index', which is widely used in empirical trade literature to identify a country's weak and strong export sectors. The Revealed Comparative Advantage (RCA) index is defined by BALASSA (B) (1965) as follows:

$$B = (X_{ij} / X_{it}) / (X_{nj} / X_{nt})$$

where X represents exports, i is a country, j is a commodity, t is a set of commodities, and n is a set of countries. The B index is based on observed trade patterns. It measures a country's exports of a commodity relative to its total exports and to the corresponding export performance of a set of countries, e.g., the EU-15. If $B > 1$, then a comparative advantage is revealed, i.e. a

sector in which the country is relatively more specialized in terms of exports. In our case X_{ij} describes Hungarian, Croatian and Slovenian exports for a particular agro-food product group to the old EU-15 countries, while X_{nj} is total agro-food trade of Hungary, Croatia and Slovenia to EU-15. X_{it} denotes the EU-15's exports for a given agro-food product and X_{nt} total merchandise exports by EU-15 countries, which are used as the benchmark of comparison.

VOLLRATH (1991) offered an alternative specification of revealed comparative advantage, called by the relative trade advantage (RTA), which accounts for exports as well as imports. It is calculated as the difference between relative export advantage (RXA), which equates to the Balassa (B) index (or RCA index), and its counterpart, relative import penetration advantage (RMA):

$$RTA = RXA - RMA$$

where,

$$RXA = B = RCA$$

and

$$RMA = (M_{ij} / M_{it}) / (M_{nj} / M_{nt})$$

where M represents imports. Thus,

$$RTA = [(X_{ij} / X_{it}) / (X_{nj} / X_{nt})] - [(M_{ij} / M_{it}) / (M_{nj} / M_{nt})]$$

If $RTA > 0$, then a comparative trade advantage is revealed, i.e. a sector in which the country's trade is relatively more competitive. Similarly as the $RXA = B = RCA$ index, the RTA is based also on observed trade patterns. It measures a country's exports and imports of a commodity relative to its total exports and imports, respectively, to the corresponding export and import performance of a set of countries (EU-15), which are used as the benchmark of comparison.

We classify RTA index in three categories: $RTA < 0$ refers to all those product groups with an absence of comparative trade advantage or to products with comparative trade disadvantage. $RTA = 0$ refers to all those product groups in a break even point without trade advantage or trade disadvantage. $RTA > 0$ refers to all those product groups with a comparative trade advantage. These boundaries are consistent with theoretical interpretation appropriate for cross-country comparisons.

The empirical analysis is conducted using detailed trade data from Organisation for Economic Co-operation and Development (OECD) by the years 1995-2003. Agro-food trade is defined by EU-Commission (1999), which also includes trade in forestry products. Data sample consists of 255 items at four-digit level in Standard International Trade Classification (SITC) system.

3 RESULTS

3.1 Levels and patterns in development of relative trade (dis)advantages over time

Hungary experiences comparative export advantage on the EU-15 markets, but both the mean value of the RXA index and the proportion of the agro-food products with the comparative export advantages deteriorated over time (Table 1). On the other hand, Hungary experiences comparative disadvantage in import penetration of agro-food products. The RMA index tends to increase over time as well as the proportion of the agro-food products with the comparative disadvantage in import penetration increased a bit over time. As a result, Hungary in the mid-1990s experienced considerable comparative trade advantage in agro-food products on the EU-15 markets, but this deteriorates over time both in terms of the magnitude of the RTA index

as well as of the proportion of the agro-food products with the comparative trade advantage. In the years 2001-2002 Hungary experienced comparative trade disadvantage on the EU 15 markets, and the RTA index stabilized around zero (0) in 2003 with the lowest proportion of the agro-food products with the comparative trade advantage on the EU-15 markets. These results indicate that the effects of liberalization, privatization and restructuring in the Hungarian agro-food sectors had the initial positive effects on comparative trade advantages for the Hungarian agro-food sector, but the later developments suggest difficulties to maintain comparative trade advantages less due to exports to the EU-15 markets, but particularly due to difficulties in competition on domestic markets with the imported agro-food products from the EU-15 markets. A part of agro-food comparative trade advantages are also likely to be achieved by the previous but this discourages comparative trade advantages when both exports and imports performance imports of intermediary inputs that are used for exported agro-food products, are considered simultaneously.

Table 1: Trade measures for Hungary

Year	RXA		RMA		RTA	
	Mean	Share of RXA>1	Mean	Share of RMA>1	Mean	Share of RTA>0
1995	9.96	0.29	2.86	0.25	7.10	0.38
1996	10.89	0.28	3.78	0.28	7.11	0.37
1997	9.72	0.28	3.05	0.27	6.67	0.36
1998	5.85	0.24	2.74	0.25	3.11	0.36
1999	5.04	0.22	3.84	0.22	1.20	0.37
2000	5.23	0.21	3.30	0.25	1.93	0.33
2001	5.39	0.23	7.75	0.25	-2.36	0.33
2002	6.34	0.22	7.59	0.25	-1.25	0.34
2003	5.02	0.23	4.87	0.28	0.15	0.31

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

Croatia in general experiences revealed comparative advantage in exports of agro-food products to the EU-15 markets (Table 2). Since 2000, it has strengthened relative export advantages as measures by both the level of the RXA index and by the proportion of agro-food products with relative export advantages on EU-15 markets. However, on the other hand, there is also an increase in relative import penetration disadvantages as suggested by the increase of the RMA index and the increase of the proportion of products with the relative import penetration disadvantages. Finally, there is less clear any pattern of significant improvements to reduce relative trade disadvantages in agro-food trade of Croatia with the EU-15 markets. The RTA index is deeply negative and only around one-fifth of Croatian agro-food trade with the EU-15 experiences relative trade advantages.

Table 2: Trade measures for Croatia

Year	RXA		RMA		RTA	
	Mean	Share of RXA>1	Mean	Share of RMA>1	Mean	Share of RTA>0
1995	2.57	0.17	11.43	0.33	-8.85	0.23
1996	2.80	0.16	17.53	0.35	-14.73	0.20
1997	2.48	0.16	15.58	0.35	-13.10	0.20
1998	2.34	0.14	11.61	0.35	-9.27	0.20
1999	2.53	0.15	12.64	0.33	-10.11	0.20
2000	2.23	0.15	11.79	0.37	-9.56	0.18
2001	3.39	0.16	21.72	0.41	-18.33	0.20
2002	6.72	0.18	19.63	0.38	-12.91	0.22
2003	5.93	0.18	12.71	0.35	-6.78	0.22

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

Trade measures for Slovenia confirmed revealed comparative disadvantages in exports, relative import penetration disadvantages and relative trade disadvantages on the EU-15 markets (Table 3). Only around 11% of Slovenian agro-food exports to the EU-15 markets are classified with revealed comparative export advantage and only 15% of total agro-food trade of Slovenia with the EU-15 experienced relative trade advantages. These numbers are relatively low. Yet, more than one-third of agro-food imports from the EU-15 to Slovenia are classified as relative import penetration disadvantages. These results suggest that Slovenia experienced difficulties to find agro-food products able to be with revealed comparative export advantages, but on the other hand there are also relatively a high proportion of agro-food products where Slovenia is not able to compete on domestic markets with the agro-food imports from the EU-15. The Slovenian imports of agro-food products from the EU-15 increased substantially covering domestic consumption where production is either not existent or substituting inefficient domestic production, which is very low or is shrinking.

Table 3: Trade measures for Slovenia

Year	RXA		RMA		RTA	
	Mean	Share of RXA>1	Mean	Share of RMA>1	Mean	Share of RTA>0
1995	1.08	0.14	13.48	0.33	-12.40	0.22
1996	1.25	0.13	16.56	0.33	-15.31	0.20
1997	1.47	0.12	17.42	0.33	-15.96	0.18
1998	1.03	0.11	14.49	0.36	-13.46	0.19
1999	0.96	0.10	21.38	0.34	-20.43	0.17
2000	0.86	0.11	19.00	0.34	-18.14	0.18
2001	0.75	0.10	38.68	0.35	-37.93	0.14
2002	0.74	0.11	30.55	0.34	-29.82	0.16
2003	0.72	0.11	16.81	0.33	-16.09	0.15

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

3.2 Relative trade (dis)advantages by product groups

Following CHEN et al. (2000) we classify agro-food trade into four product groups: Bulk raw commodities, processed intermediates, consumer-ready food, and horticulture. Table 4 presents relative trade advantage measures by product groups for Hungarian trade with the EU-15. The each of the product groups explore revealed comparative export advantages on the EU-15 markets, but the level of the RXA indices vary by products groups. The RXA index indicates very strong revealed comparative advantages in exports for bulk raw agricultural, forestry and food products as well as for processed intermediates. For both these product groups there is also found the highest variations in the RXA indices as indicated by the standard deviations of the mean value of the RXA index. Horticultural products and consumer-ready food explore revealed comparative advantage in exports on the EU-markets as suggested by the RXA greater than one.

On the other hand, the each of the product groups for Hungary explores relative disadvantages in import penetration from the EU-15 markets. The RMA index is greater than one for the each product groups, particularly for consumer-ready food where domestic Hungarian food processing is facing difficulties to compete with the imported consumer-ready foods either in varieties for different consumer tastes or in their quality and different consumer preferences as a potential for development of intra-industry trade.

The RTA index indicates Hungarian relative trade advantages on the EU-15 markets for bulk of raw agricultural, forestry and food products and processed intermediates as well as for horticulture (e.g. paprika and onions), but not for consumer-ready food, where the RTA is of negative sign suggesting Hungarian relative comparative trade disadvantages on the EU-15 markets in this product group.

Table 4: Trade measures for Hungary by product groups, 1995-2003

	Mean			Standard deviation		
	RXA	RMA	RTA	RXA	RMA	RTA
Bulk	15.45	1.65	13.79	5.70	0.75	5.61
Processed intermediates	9.88	3.72	6.17	3.80	1.36	3.26
Consumer-ready	1.86	6.53	-4.67	0.49	4.75	5.01
Horticulture	3.40	2.36	1.04	1.04	3.78	3.88

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

The RXA indices for Croatia also revealed relative comparative advantages in exports of agro-food products to the EU-15 markets (Table 5). In comparison with Hungary, the RXA index for Croatia for processed intermediates is lower, but higher for consumer-ready food. This indicates that Croatia experienced relative comparative advantages in exports of specific high-degree processed consumer-ready products. However, the RMA indices for Croatia indicate relative comparative disadvantages in import penetration particularly for consumer-ready food and processed intermediates, where the RTA indices clearly indicate Croatian relative comparative trade disadvantages with the EU-15. The Croatian relative comparative trade advantage is clearly confirmed only for bulk raw agricultural, food and forestry products. For horticultural products, although the RTA index is close to zero, it is also of a positive sign suggesting relative comparative trade advantages for some Croatian horticultural products (natural honey, plants and parts of plants for perfume for pharmacy) on the EU-15 markets.

Table 5: Trade measures for Croatia by product groups, 1995-2003

	Mean			Standard deviation		
	RXA	RMA	RTA	RXA	RMA	RTA
Bulk	11.36	2.08	9.28	5.13	1.90	6.03
Processed intermediates	1.11	16.93	-15.82	0.27	7.43	7.61
Consumer-ready	2.01	21.64	-19.63	1.40	10.23	9.22
Horticulture	1.41	1.25	0.16	0.90	0.15	0.97

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

Slovenia experiences revealed comparative advantages in exports on the EU-15 markets for bulk raw agricultural, food and forestry products as well as for processed intermediates, but not for consumer-ready food and for horticultural products (Table 6). Slovenia experiences significant relative comparative disadvantages in import penetration particularly of consumer-ready food, processed intermediates and also for bulk raw agricultural, food and forestry products and to a lesser degree also for horticultural products. Finally, there are found Slovenian relative comparative trade disadvantages in the each of the analyzed product groups. Except of horticultural products (fresh apples and natural honey), the variations in the RMA and RTA indices are relatively high as suggested by the standard deviation of their mean values.

Table 6: Trade measures for Slovenia by product groups, 1995-2003

	Mean			Standard deviation		
	RXA	RMA	RTA	RXA	RMA	RTA
Bulk	1.91	6.15	-4.25	0.26	6.22	6.22
Processed intermediates	1.27	21.37	-20.10	0.67	8.84	8.47
Consumer-ready	0.49	30.67	-30.18	0.09	20.19	20.22
Horticulture	0.22	1.05	-0.83	0.07	0.09	0.13

Source: Own calculations based on OECD data.

Notes: RXA – Relative export advantage, RMA – Relative import penetration advantage, and RTA – Relative trade advantage.

4 FINDINGS AND CONCLUSIONS

This paper has applied in empirical work recent theoretical and methodological developments in international trade investigating relative comparative trade advantages in agro-food trade of Hungary, Croatia and Slovenia, respectively, with the EU-15 markets. We have analyzed levels and patterns in directions of development of three relative comparative trade advantage indices using the EU-15 as the benchmark of comparisons: Revealed comparative export advantage index, relative import penetration index, and relative comparative trade advantage index. We have presented relative comparative trade advantages across countries and over time as well as by main products groups according to the degree of processing.

The relative trade advantage measures for Hungarian, Croatian and Slovenian agro-food products groups in the EU-15 markets indicates that Hungary initially performed the best in agro-food exports, but the export performance has deteriorated over time. On the contrary, the Croatian agro-food relative comparative export performance to the EU-15 has improved over

time when Croatia after the war has entered into the preferential trade agreements with the EU-15 markets. The Slovenian agro-food relative comparative export performance to the EU-15 markets is the worst among the analyzed countries by the level of the revealed comparative export advantage index and by its patterns of development over time. The RXA results suggest that Hungary and Croatia are likely to maintain revealed comparative export advantage to the EU-15 markets for about one-fifths to one-fourths of agro-food exports, whereas for Slovenia this proportion is only at the level of around one-tenths of the Slovenian agro-food exports to the EU-15 markets. Implications of these developments in relative export advantage patterns with reliance on exports of bulk of agricultural, food and forestry products from these Central European countries to the EU-15 markets are not very promising if these new emerging market economies will not achieve significant improvements also in food processing as visible from the lowest level of revealed comparative export advantage indices for a higher processed consumer-ready foods.

As interesting, we have found relatively high absolute values for the relative import penetration (dis)advantage index for the each of the analyzed countries in imports from the EU-15 markets. More than one-fourth of agro-food imports from the EU-15 markets for Hungary and around one-third for Croatia and Slovenia are found with the relative comparative import penetration disadvantage. This result is an outcome of the situation where the share of agro-food products' imports from the EU-15 markets is very high for Hungary, Croatia and Slovenia, higher than the share of total merchandise imports from the EU-15 countries. This finding suggests that the agro-food imports of a certain product groups increased from the EU-15 to Hungary, Croatia and Slovenia, thus the production of these agro-food products in the latter countries is either not existent or very low. On the other hand, the EU-15 markets are much wider by the varieties of agro-food products that are produced and much deeper by their size of agro-food production. Several agro-food products that are produced in the EU-15 countries are either not produced or are produced at a relatively low level or only seasonally in Hungary, Croatia, and Slovenia. Among such products are some fruits and vegetables. However, the empirical results suggests that the major difficulties in relative import penetration in Hungary, Croatia, and Slovenia from the EU-markets are in consumer-ready foods and processed intermediaries, the finding, which holds less for bulk of agricultural, food and forestry products, and horticultural products. This indicates that some domestic agro-food productions in Hungary, Croatia, and Slovenia are facing difficulties of competition on the domestic markets either due to restructuring problems or lack of some other factors of international competitiveness and thus difficulties in successful relative import penetration with the imports from the EU-15 markets in an open competition.

The empirical results of relative comparative trade advantage indices for Hungary confirmed deterioration of Hungarian agro-food relative trade advantages in the EU-15 markets from the initial relative comparative trade advantages to the recent relative comparative trade disadvantages. This deterioration of relative comparative trade advantages is also revealed for the relative proportion of agro-food trade with the relative comparative trade advantages from more than one-third of trade to less than one-third of agro-food trade between Hungary and the EU-15 markets. The initial results of Hungarian agro-food sector restructurings were more promising in agro-food trade with the EU-15, but seem to be less sustainable with the EU-15 markets. Among agro-food product groups with considerable relative comparative trade disadvantages between Hungary and the EU-15 markets are identified consumer-ready foods, whereas relative comparative trade advantages are found particularly for bulk of agricultural, food and forestry products and processed intermediaries. The Croatian initial position in relative comparative trade advantages in agro-food products with the EU-15 markets was less promising, which is consistent with the difficulties, which the Croatian economy in general and the agro-food sector in particular faced after the war destructions. Later developments indicate a slight

recovery in relative trade advantages, but the agro-food trade with the EU-15 markets continued to face relative comparative trade disadvantages as only around one-fifth of its agro-food trade with the EU-15 markets is classified with relative comparative trade advantages. Only bulk of agricultural, food and forestry products and to a lesser extent horticultural products are found with relative comparative trade advantages, whereas considerable relative comparative trade disadvantages are found for processed intermediaries and for consumer-ready foods indicating difficulties of the Croatian food processing sector in trade with the EU-15 markets. Slovenian agro-food trade with the EU-15 markets in terms of relative trade advantages has performed the worst with further deterioration of unfavourable relative comparative trade disadvantages and reduction of the proportion of agro-food trade with relative comparative trade advantages with its stabilization at around 15 percent of total agro-food trade between Slovenia and the EU-15 markets. Yet, we have not identified any broader agro-food product group by the degree of processing for Slovenia with relative comparative trade advantage.

Therefore, the results for Croatia are somehow in between: Closer to Hungary for some bulk crop-based product groups (maize and oilseeds), and closer to Slovenia for animal and food products (live bovine animals, sheep and goats). These empirical results suggest larger scope for an efficient agro-food development in Hungary and to a lesser extent in Croatia, but less likely in Slovenia considering the levels and patterns in development of relative comparative trade advantage indices that reflect competitive constraints more likely from natural factor endowments and current less competitive agro-food structures. This implies that there is also a scope for possible efficiency improvements by transformation and restructuring of the agro-food sectors, investments in technology improvements, food processing and upgrading of product qualities. The changes in the agro-food sector and in the rural economy are seen in synergy with new approaches of production, food processing and marketing within a food chain as a part of multi-sector rural development that can be also supported by EU policies such as rural development policies, structural and cohesion funds for the EU-27 members, which is among the three analyzed countries relevant for Hungary and Slovenia or from the EU pre-enlargement supports, which is relevant for Croatia.

The EU-15 agro-food exports are found significant for Slovenian, Croatian and to a lesser extent Hungarian agro-food imports. These EU-15 exports during the analyzed period were also supported and thus caused by the EU-15 export subsidies. With the EU membership of Hungary and Slovenia in the enlarged EU-25 and currently in the enlarged EU-27, this change may cause some new developments in relative comparative trade advantages. This is an area for future research as may cause commercial agro-food trading and may be of relevance to policy makers in rural development with policy implications for competitive agro-food trade and sustainable rural economy development of these three analyzed countries in the Single European Market (SEM).

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