DOES COMPARATIVE ADVANTAGES IN AGRO-FOOD TRADE MATTER FOR MULTIFUNCTIONAL RURAL DEVELOPMENT: THE CASE OF HUNGARY AND SLOVENIA

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ABSTRACT

This paper investigates revealed comparative trade advantages in agro-food trade and their associations with multifunctional and sustainable rural development. We analyze revealed comparative advantages of Hungarian 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 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 across products groups and their patterns over time to provide broader policy implications. The empirical results for Hungary confirmed few agro-food product groups with revealed comparative advantages in the EU markets, but have not identified any such agro-food product group for Slovenia. Agro-food sectors in Hungary are likely to continue to have a significant role in the Hungarian 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. The agro-food sector is likely to restructure towards non-traditional ways of production and marketing such as bio-production and rural tourism at farms, but also the role multifunctional agricultural and non-agricultural, services activities in sustainable rural development are likely to increase significantly.

Keywords: revealed comparative advantage, multifunctional development, Hungary, Slovenia.

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. 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. 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 and Slovenia within the enlarged European Union (EU).

The paper contributes to the existing literature in at least two significant directions. Firstly, the paper contributes to a better understanding of the revealed comparative advantages of Hungarian and Slovenian agro-food trade, employing Balassa (1965) revealed comparative advantage index and recent developments in international trade theory literature. Therefore, the paper applies in empirical work recent theoretical and methodological developments in international trade. It provides an insight of the level and dynamics in revealed comparative advantage index for agro-food trade of Hungary and Slovenia using the EU-15 as the benchmark of comparison. We explain how these trade developments have developed and how they are likely to develop in the future. Second, we aim to indicate ways in which trade is likely to evolve or change 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 AND DATA USED

The nature of comparative advantages in trade data 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:

$$B = (Xij / Xrj) / (Xis / Xrs) \qquad (1)$$

where X represents exports, i is a commodity, j is a country, r is a set of commodities and s is a set of countries. B is based on observed trade export 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. 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 and Slovenian exports for a particular product group to the old EU-15 countries, while X_{is} is total agro-food trade of Hungary and Slovenia to EU-15. X_{rj} denotes the EU-15's exports for a given product and X_{rs} total agro-food exports by EU-15 countries, which are used as the benchmark of comparison.

The empirical analysis is conducted using detailed trade data from OECD by the years 1992-2002. 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. The nature of comparative advantage in Hungarian agro-food trade with the EU

Fertő (2004 and 2005) analyzes in more detail Hungarian agro-food trade with the EU, whereas bilateral agro-food trade between Hungary and Slovenia was analyzed by Bojnec and Fertő (2005). The empirical results on the nature of comparative advantage of the Hungarian and Slovenian agro-food trade in the EU markets are presented separately by countries and within a country by the one-digit and two-digit SITC product categories.

At the one-digit SITC level Hungarian SITC 0-food and live animals and SITC 2-crude materials, inedible, except fuels, explore revealed comparative advantage on the EU-15 markets (Table 1). Although there is a slight decline in the revealed comparative advantage index over time, it remains for the each analyzed year greater than 1. The deterioration patterns are also seen in the revealed comparative advantage indices for SITC 1-beverages and tobacco, which in more years suggests revealed comparative disadvantages in the EU-15 markets and for SITC 4-animal and vegetable oils, fats and waxes, where is clearly illustrated switch from revealed comparative advantages to revealed comparative disadvantages. Deterioration in Hungarian agro-food revealed comparative advantages on one side suggests that on long-term the importance of these traditional agro-food export-oriented

Table 1 Revealed Comparative Advantage for Hungarian Agro-Food Products (Benchmark EU-15)

One-digit SITC level	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
0 Food and live animals	2.24	1.79	1.92	2.23	2.02	1.59	1.35	1.08	1.04	1.13	1.31
1 Beverages and tobacco	0.78	1.26	1.06	1.27	1.53	0.74	0.57	0.37	0.25	0.22	0.21
2 Crude materials, inedible, except fuels	2.33	2.70	2.49	2.23	2.43	1.55	1.39	1.37	1.39	1.14	1.50
4 Animal and vegetable oils, fats and waxes	2.82	2.67	2.11	0.93	0.94	2.21	1.52	0.96	0.60	0.43	0.54
Two-digit SITC level	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
00: Live animals other than animals of division 03	2.51	2.58	4.00	3.54	4.15	3.30	2.27	1.71	2.18	2.99	2.0021
01: Meat and meat preparations	4.20	4.29	3.98	4.18	4.94	3.57	2.79	2.27	2.17	2.28	2.45
02: Dairy products and birds' eggs	0.51	0.50	0.32	0.34	0.42	0.32	0.35	0.33	0.35	0.41	0.40
03: Fish, crustaceans, mollusks	0.12	0.10	0.14	0.13	0.13	0.06	0.07	0.05	0.04	0.03	0.03
04: Cereals and cereal preparations	3.59	0.99	1.62	4.06	1.32	2.04	2.13	1.32	1.16	1.49	1.34
05: Vegetables and fruits	2.10	2.40	2.62	2.33	2.30	1.43	1.10	0.92	0.88	0.86	1.42
06: Sugar, sugar preparations and honey	1.92	0.86	0.70	1.22	1.35	0.95	1.21	0.74	0.53	0.59	1.08
07: Coffee, tea, cocoa, spices	1.17	1.12	1.20	1.11	1.16	0.73	0.57	0.58	0.55	0.56	0.67
08: Feedstuff for animals	1.38	1.01	0.69	0.88	1.39	0.75	0.77	0.93	1.22	1.40	1.96
09: Miscellaneous edible products & preparations	1.25	1.38	1.65	1.51	1.82	1.67	1.62	1.52	1.42	1.30	1.50
11: Beverages	0.95	1.45	1.30	1.68	1.50	0.79	0.65	0.35	0.32	0.28	0.24
12: Tobacco and tobacco manufactures	0.32	0.65	0.32	0.02	1.61	0.59	0.35	0.42	0.03	0.06	0.10
21: Hides, skins and furskins, raw	0.87	0.96	0.96	0.60	0.65	0.61	0.37	0.28	0.29	0.22	0.23
22: Oil seeds and oleaginous fruits	6.06	14.05	11.74	12.39	13.08	5.18	3.74	4.78	6.58	5.23	8.74
23: Crude rubber	0.21	1.28	0.48	1.21	0.05	0.06	0.08	0.04	0.05	0.08	0.14
24: Cork and wood	2.97	2.61	2.15	2.13	2.28	1.59	1.56	1.76	1.62	1.26	1.01
26: Textiles fibres and their wastes	1.43	1.17	1.06	0.97	0.89	0.82	0.69	0.23	0.28	0.27	0.92
29: Crude animal and vegetable materials, n.e.s.	1.65	1.95	2.20	1.71	1.85	1.23	1.11	0.91	0.95	0.81	1.56
41: Animal oils and fats	4.22	3.46	2.92	1.39	2.14	1.00	0.57	0.30	0.68	0.57	0.44
42: Fixed vegetable oils and fats	3.37	3.34	2.63	1.12	1.03	2.79	1.93	1.21	0.72	0.51	0.70
43: Processed animal and vegetable oils and fats	0.01	0.02	0.00	0.06	0.06	0.07	0.14	0.13	0.14	0.08	0.10

Source: Own calculations based on OECD database.

activities to the EU-15 markets is shrinking vis-à-vis other economic activities with increasing market shares in the EU-15 markets. Looking from a perspective of multifunctional rural development, this suggests that agriculture, food and forestry is likely to continue to play a significant role in the Hungarian rural areas, but employment and income activities are more likely to be combined with other more rapidly growing activities. This will create new and different demands in local product and factor markets, particularly in labor market. Thus also changes in regular education system as well as in long-life learning should be adjusted to these expected new developments.

At the two-digit SITC level, the Hungarian revealed comparative advantage indices differ by product groups and over time. Without revealed comparative advantage or with revealed comparative disadvantage are the following five product groups (the revealed comparative advantage index is less than one): 02-dairy products and birds' eggs, 03-fish, crustaceans and mollusks, 12-tobacco and tobacco manufactures (except in 1996), 21-raw hides, skins and furskins, 23-crude rubber (except 1993), and 43-processed animal and vegetable oils and fats. The other two-digit SITC product groups indicate revealed comparative advantage in the EU-15 markets as the revealed comparative advantage measures is greater than one. For some two-digit SITC product groups the revealed comparative advantage measure indicates deterioration, but the most two-digit product groups can be still included into the group with revealed comparative advantage (the revealed comparative advantage measure greater than one).

4. The nature of comparative advantage of Slovenian agro-food trade with the EU

The revealed comparative advantage measure for Slovenian agro-food trade with the EU-15 clearly indicates an absence of any one-digit SITC product category with revealed comparative advantage. The revealed comparative advantage measure close to zero (0) suggests revealed comparative disadvantage in the Slovenian agro-food trade in the EU-15 markets. The similar findings can be

Table 2 Revealed Comparative Advantage for Slovenian Agro-Food Products (Benchmark EU-15)

One-digit SITC level	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
0 Food and live animals	0.006	0.005	0.005	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
1 Beverages and tobacco	0.007	0.004	0.004	0.004	0.005	0.005	0.007	0.007	0.009	0.008	0.009
2 Crude materials, inedible, except fuels	0.012	0.011	0.010	0.010	0.010	0.011	0.011	0.012	0.013	0.012	0.013
4 Animal and vegetable oils, fats and waxes	0.004	0.003	0.002	0.002	0.003	0.005	0.004	0.003	0.002	0.002	0.004
Two-digit SITC level	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
00: Live animals other than animals of division 03	0.007	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004
01: Meat and meat preparations	0.012	0.009	0.009	0.008	0.008	0.008	0.008	0.008	0.007	0.008	0.008
02: Dairy products and birds' eggs	0.005	0.003	0.004	0.004	0.004	0.004	0.004	0.005	0.005	0.006	0.006
03: Fish, crustaceans, mollusks	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.002
04: Cereals and cereal preparations	0.002	0.002	0.002	0.001	0.003	0.003	0.003	0.002	0.002	0.002	0.002
05: Vegetables and fruits	0.007	0.006	0.006	0.004	0.004	0.003	0.003	0.003	0.003	0.002	0.003
06: Sugar, sugar preparations and honey	0.008	0.007	0.007	0.007	0.006	0.006	0.005	0.005	0.006	0.006	0.006
07: Coffee, tea, cocoa, spices	0.003	0.003	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.001	0.002
08: Feedstuff for animals	0.005	0.004	0.005	0.004	0.005	0.004	0.005	0.006	0.006	0.005	0.006
09: Miscellaneous edible products & preparations	0.007	0.006	0.008	0.006	0.006	0.006	0.005	0.006	0.006	0.006	0.007
11: Beverages	0.007	0.005	0.004	0.004	0.006	0.005	0.006	0.006	0.008	0.009	0.010
12: Tobacco and tobacco manufactures	0.009	0.003	0.004	0.003	0.003	0.005	0.010	0.012	0.011	0.006	0.006
21: Hides, skins and furskins, raw	0.011	0.012	0.011	0.013	0.013	0.018	0.022	0.028	0.027	0.024	0.018
22: Oil seeds and oleaginous fruits	0.001	0.000	0.000	0.002	0.001	0.000	0.000	0.000	0.000	0.001	0.003
23: Crude rubber	0.023	0.001	0.004	0.001	0.004	0.000	0.000	0.001	0.008	0.003	0.001
24: Cork and wood	0.027	0.025	0.022	0.021	0.022	0.023	0.023	0.027	0.027	0.022	0.019
26: Textiles fibres and their wastes	0.004	0.002	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.001
29: Crude animal and vegetable materials, n.e.s.	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003
41: Animal oils and fats	0.012	0.015	0.017	0.009	0.006	0.003	0.003	0.004	0.003	0.002	0.002
42: Fixed vegetable oils and fats	0.003	0.002	0.001	0.001	0.002	0.005	0.004	0.002	0.002	0.002	0.005
43: Processed animal and vegetable oils and fats	0.002	0.002	0.002	0.003	0.006	0.008	0.008	0.007	0.005	0.003	0.004

Source: Own calculations based on OECD database.

derived from the results at the two-digit SITC level. Within the EU environment the traditional Slovenian agro-food sector is more likely to shrink due to the increasing competitive pressures from more developed and competitive markets with the enlarged EU markets. This is likely to have important implications on multifunctional rural development where on one side agro-food sector is likely to develop non-traditional ways of production and marketing such as bio-production and rural tourism at farms, but also with a greater movement of employment and thus incomes from non-agricultural, service activities in rural areas.

5. Conclusions and policy implications

We have found a tendency toward increased polarization of revealed comparative advantage measure in agro-food trade for the analyzed countries: Slovenia has not experienced any agro-food product group with revealed comparative advantage, whereas Hungary has experienced diversified patterns in revealed comparative advantage measure. However, in several agro-food product groups Hungary has been loosing revealed comparative advantage. The results suggest that: firstly, Hungary is more likely to remain a significant exporter of agro-food products to EU markets, which will provide employment and income opportunities to rural areas, whereas Slovenia is more likely to shift from less competitive and less profitable agro-food activities towards higher value-added activities particularly in non-agricultural, service activities. Secondly, both Slovenian and Hungarian rural areas are likely to search for new multifunctional activities on farms to diversify production and differentiate its products to achieve higher prices and higher incomes for rural population. Such activities are likely bio-production and rural tourism on farms, which are developing in both countries. Finally, these structural changes will also require changes in factor markets, particularly in the labor market to adjust to new developments of information-communication societies, which are also bringing new challenges for multifunctional and sustainable rural development.

REFERENCES

Balassa, B. (1965). Trade Liberalization and Revealed Comparative Advantage. The Manchester School of Economic and Social Studies, 33(1): 99-123.

Bojnec, Š. and Fertő, I. 2005. Classifying Trade Flows in Agri-Food Products between Hungary and Slovenia. Studies in Agricultural Economics 103: 17-36.

EU-Commission (1999). The Agricultural Situation in the European Community. 1998 Report. Brussels.

Fertő, I. (2004). Agri-Food Trade between Hungary and the EU. Budapest: Századvég, 2004

Fertő, I. (2005). Vertically differentiated trade and differences in factor endowment: The case of agri-food products between Hungary and the EU. Journal of Agricultural Economics, 56, 117-134.

Liesner, H.H. (1958). The European Common Market and British Industry. Economic Journal, 68: 302-316.