An Assessment of the Slovak Agri-food Trade Specialisation Pattern[1]

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Abstract

The paper analyses the agri-food trade specialisation pattern in Slovakia prior to and after its accession to the European Union in the period 2000 – 2005. The most competitive Slovak agri-food commodities in trade with the examined trade groupings were consumer-oriented products. Degree of agri-food trade specialisation dropped over the period for all most important markets. At the same time, Slovakia did not maintain positions of the most competitive commodities; however, it improved positions of a number of previously uncompetitive ones. After 2004, the dynamics of previously rigid trade specialisation with the EU-15 and the New Member States of the 2004 EU enlargement accelerated. This is likely to lead to convergence of Slovak trade specialisation dynamics across trade partners/groupings.

Keywords: *agri-food trade; specialisation; Lafay index; Markov matrices*

JEL Classification: F15, F14, Q17

Introduction

The integration process with the European Union (EU) accelerated economic development in acceding countries and provided opportunities for further economic and trade reforms. In this paper the accession process implications on Slovak agri-food trade pattern over 2000 – 2005 period are analysed.

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Prior to the EU accession, Slovakia was the signatory to several agreements aimed at gradual trade liberalisation. Trade with the Czech Republic carried out within the customs union framework. As an attempt for mutual trade liberalisation, the Central European countries formed Central European Free Trade Agreement (CEFTA) with trade agreements on a bilateral basis. Accession agreements, and Double Zero and Double Profit agreements with the EU, also largely influenced Slovak agri-food trade development.

The structural changes in an economy are supposed to evoke changes in trade specialisation. Thus, the aim of the study was to investigate the changes in Slovak agri-food trade specialisation pattern from 2000 to 2005, in the pre- and post-accession period.

Recently, there has been a growing interest in the investigation of a country or regional trade specialisation patterns (e.g. Proudman and Redding, 2000; Vokorokosová and Čarnický, 2003; Hinloopen and Marrewijk, 2004; Zaghini, 2005). These papers deal with total trade specialisation without a special focus on agri-food commodities. Fertö and Hubbard (2003) and Bojnec and Fertö (2007), analysed agri-food trade specialisation of selected Central and Eastern European Countries (CEEC).

There is, however, a rather limited number of studies devoted specifically to the analysis of comparative advantages and/or specialisation of Slovak agri-food trade (Matošková, 2003; Drabik and Bartová, 2007; Matošková, Gálik and Meravá, 2007).

This paper contributes to the existing literature by bridging the gap in studies focusing on Slovak agri-food trade and by an analysis of development of specialisation in the pre- and post-accession period. A high level of commodity disaggregation – a six-digit code of the Harmonized Commodity Description and Coding System (HS) of tariff nomenclature, was used in this paper. Furthermore, the most competitive commodities according to the level of processing were examined.

Organisation of the paper is as follows. Next section briefly reviews theoretical concepts. It is followed by sections on methodology and data used. The results of the study are presented in the fifth section. The last section discusses the results and draws conclusions.

Comparative Advantages and Competitiveness

Three terms are frequently used in literature on trade dynamics: comparative advantage, specialisation and competitiveness.

Most recent trade studies do not examine comparative advantages of commodities directly via opportunity costs, rather indirectly as revealed comparative

advantage by analysing foreign trade. The concept of revealed comparative advantages is, nonetheless, not able to answer the question where does the comparative advantage stem from.

Trade specialisation is most often understood as particular efficiency in producing a specific good in a specific area, which is made identical to the concept of comparative advantage (e.g. Laursen, 1998; Borbély, 2004; Tamberi, 2006). On the other hand, Redding (2002) uses this term for the bulk of different goods produced or traded by a specific area, which is an analogy to the concept of concentration. Allen (2001) uses terms specialisation and comparative advantage interchangeably, since he argues that specialisation (comparative advantage) occurs when a country exports a major part of a product's production. Conversely, there is despecialisation (comparative disadvantage) when a country imports a major proportion of a certain type of product in order to satisfy domestic demand.

The papers analysing dynamics of comparative advantages and/or specialisation use an index measuring the degree of the advantage/specialisation in a point in time. Such an index comprises either solely export flows, or combines exports and imports to better capture the intra-industry trade. Either way, according to the common understanding the index value is generally accepted as a degree of revealed comparative advantage.

This approach can be misleading in an analysis of agricultural trade. It is because agricultural exports are often subsidised and therefore one could identify as comparatively advantageous those commodities that are not such in fact. The idea is underpinned by Porter (1990) who uses term competitive advantages, which, according to him, are not simply the consequence of endogenously given factor endowments, rather they are created and sustained by differences in national economic structures, which themselves can be affected by economic policies.

In the paper, we assume that a commodity has a competitive advantage if it revealed comparative advantage from a longer time perspective.

Methodology

The objective of the paper is to analyse Slovak agri-food trade specialisation pattern with its trade groupings over the period 2000 – 2005, prior to and after its accession to the EU. To assess the possible implications of EU accession for Slovak agri-food trade structure and trade flows (i) the most competitive commodities with regard to their processing level - using the Lafay index were identified; (ii) dynamics of agri-food trade specialisation with the selected trade groupings – using Markov transition matrices was analysed.

The following trade partners/groupings of the Slovak Republic were selected in the analysis: EU-15, NMS04, NMS07, CIS, USA and ROW; EU-15 – the EU Member States before 2004 enlargement. Slovak trade with EU-15 was significantly liberalised after the year 2000. NMS04 – the New Member States of the 2004 EU enlargement: the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland and Slovenia. NMS07 – the New Member States of the 2007 EU enlargement: Bulgaria and Romania. The Slovak agri-food trade with Commonwealth of Independent States (CIS) was examined with regard to close trade relations in the past. Although Slovak agri-food trade with the United States (USA) represents a negligible share of the total trade, it benefited from several bilateral agreements. All other countries were aggregated to the Rest of the World grouping (ROW). Total agri-food trade group served as a benchmark for comparison of agri-food trade development with individual trade groupings.

For identification of the most competitive commodities and analysis of the evolution of Slovak agri-food trade specialisation, modified Lafay index was applied:

$$LFI_j^i = \left\{ \begin{array}{l} 0; \qquad\qquad\qquad\qquad\qquad\qquad if\ x_j^i = 0\ \Lambda\ m_j^i = 0 \\ 100\left[\dfrac{x_j^i - m_j^i}{x_j^i + m_j^i} - \dfrac{\sum_{j=1}^{N}(x_j^i - m_j^i)}{\sum_{j=1}^{N}(x_j^i + m_j^i)}\right]\dfrac{x_j^i + m_j^i}{\sum_{j=1}^{N}(x_j^i + m_j^i)};\ i = 1;\ k;\ otherwise \end{array} \right\} \quad (1)$$

where

x_j^i – export of commodity *j* of country *i* to a selected trade grouping,

m_j^i – import of commodity *j* of country *i* from a selected trade grouping,

N – number of commodities for which the LFI is calculated,

k – number of countries/groupings.

The LFI index measures position of each commodity in a country trade by taking into account difference between individual commodity's normalised trade balance and the overall normalised trade balance. This deviation is weighted by share of a commodity turnover on the total turnover in trade with a country/ grouping. By taking into account imports, LFI allows to control for intra-industry trade and re-export flows, which is not the case with the classical Balassa RCA index (Balassa, 1965). Increasing importance of intra-industry trade in the NMS has been observed in recent years (Fidrmuc and Djablík, 2003; Ramniceanu, 2005; Caetano and Galego, 2006; Bojnec and Fertö, 2007). Another advantage of LFI over classical RCA is that due to its structure. LFI takes into account cyclical factors, which can affect the magnitude of trade flows in the short run.

The part of the index expressing that LFI takes value zero if there is no trade with a trade grouping in a commodity and a given year was modified. This situation is common especially in agricultural trade with rather remote trade partners (e.g. Estonia, USA).

Consideration of both exports and imports is important for an assessment of specialisation in a commodity. Given the index structure, sum of LFI values over all commodities equals zero. Therefore, its values for a commodity can be either positive or negative. The higher the index value, the higher the degree of specialisation.

Slovak agri-food export was concentrated to a small number of items during last years (Matošková, Gálik and Meravá, 2007; Drabik and Bartová, 2007). That is why ten most competitive commodities were identified as those having the highest LFI during at least four out of six years examined.

In order to find out the most competitive commodities in terms of their processing level, we applied a classification of DG-AGRI of the European Commission (2006). According to this classification commodities are divided into bulk products (e.g. cereals, rice, row tobacco); intermediate products (e.g. live animals, flours, vegetable waste), and consumer-oriented products (e.g. meats, dairy products, cigarettes). In general, level of processing increases from bulk to consumer-oriented products. All high value commodities are consumer-oriented, but the reversal must not necessarily be true, e.g. citrus fruits or fresh vegetables are also considered consumer-oriented.

Development of Slovak agri-food trade specialisation over time was assessed by Markov transition matrices. This approach has been applied e.g. by Proudman and Redding (2000), Redding (2002), Zaghini (2005). Fertö and Hubbard (2003) applied it in an analysis of agri-food trade patterns of CEEC.

The construction of a Markov chain requires two basic ingredients, namely transition matrix and an initial distribution. Assume a finite set $S = \{1,...,m\}$ of states. Assign to each pair $(i, j) \in S^2$ of states a real number p_{ij} such that the properties

$$p_{ij} \geq 0 \quad \forall (i, j) \in S^2 \tag{2}$$

$$\sum_{j \in S} p_{ij} = 1 \quad \forall\, i \in S \tag{3}$$

are satisfied and define the transition matrix **P** by

$$\mathrm{P} = \begin{pmatrix} p_{11} & p_{12} & \cdots & p_{1m} \\ p_{21} & p_{22} & \cdots & p_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ p_{m1} & p_{m2} & \cdots & p_{mm} \end{pmatrix}$$

Let $(X_n)_{n\in N_0}$ be a sequence of random variables with values in S. Here, n denotes the time at which the state X_n occurs.

To complete the construction of a Markov chain, an initial distribution needs to be specified. Hence, denote by D_S the set of discrete distributions on S,

$$D_S = \{\mathbf{P} = (P_i)_{i\in S} : P_i \geq 0, \sum_{i\in S} P_i = 1\} \tag{4}$$

where distributions are represented as row vectors. $\mathbf{P}_0 = (P_{0i})_{i\in S} \in D_S$ is the *initial distribution* of the chain $(X_n)_{n\in N_0}$ if $P[X_0 = i] = P_{0i}$ for all states $i \in S$.

Following Quah (1993; 1996) and Zaghini (2005) let F_t(LFI) be the distribution of Lafay index at time t across commodities. Corresponding to F_t(LFI), we may define a probability measure λ such that:

$$\lambda_t\left((-\infty; LFI]\right) = F_t(LFI);\ \forall LFI \in R \tag{5}$$

The evolution of the distribution in time is then modelled as a stochastic difference equation:

$$\lambda_t = \mathrm{P}^*(\lambda_{t-1}; u_t) \tag{6}$$

where u_t, $t \in N$ is a sequence of disturbances and P* is an operator that maps probability measures (and disturbances) into probability measures, and tracks where points in $F_{t\text{-}1}$ end up in F_t. Thus, P* encodes information on intra-distribution dynamics. For simplicity, it is assumed that this stochastic difference equation is of first order and that the operator P* is time invariant. Even so, equation is intractable and cannot be directly estimated. However, setting the disturbances u to zero and iterating the stochastic difference equation s periods forwards, we obtain:

$$\lambda_{t+s} = (\mathrm{P}^*)^s \lambda_t \tag{7}$$

If the space of possible values for *LFI* is divided into a number of discrete intervals, P* becomes a matrix, and the value of each cell turns out to be a transition probability, namely the probability that an item beginning in a given cell i, to which is associated a segment of the specialisation range, moves to another distinct cell j, characterised by a different specialisation interval.

The transition probabilities for each period considered were calculated by counting the number of transitions out of and into each interval of trade specialisation. The LFI values for each country-partner pair and respective year were ordered in an ascending order and divided into five unequally sized

intervals.[2] The reason for that was to separate the middle interval, which captures all non-traded commodities with a trade grouping in a given year.

Development of Slovak agri-food trade specialisation was investigated year after year and over a five-year period to compare situation after the enlargement and before it. In the former case, five one-year matrices for each reporter-partner pair were computed. Next, those five matrices were averaged to find out how agri-food trade specialisation developed from a short time perspective. For the latter case, transition matrices between 2000 – 2001 and 2004 – 2005 were calculated. Comparison of the two results reveals changes of Slovak agri-food trade specialisation.

For the two most important trade groupings – the EU-15 and NMS04, the average one-year matrices for the pre-accession (2000 – 2003) and post-accession (2004 – 2005) period were calculated to find out if the dynamics of agri-food trade specialisation has been accelerated since the accession of Slovakia to the EU.

Trade grouping comparison of trade specialisation dynamics was carried out by two measures suggested by Shorrocks (1978):

$$M_1 = \frac{n - tr(\mathrm{P}^*)}{n-1};\ M_2 = 1 - \left|\det(\mathrm{P}^*)\right| \tag{8}$$

where

n – number of rows/columns of a transition matrix P^*;
$tr(\mathrm{P}^*)$ – trace of the transition matrix (sum of elements on the main diagonal);
$\det(\mathrm{P}^*)$ – determinant of P^*.

For both indicators higher value suggests higher degree of mobility of commodities between levels (intervals) of trade specialisation. M_1 uses information on the main diagonal, i.e. it measures explicitly the mobility (by means of transition probabilities) only of those commodities that were supposed not to change their specialisation level. M_2 is more general because via determinant it captures all changes in the matrix, i.e. in addition to M_1, it evaluates probabilities of any changes in specialisation level. Thus, M_1 and M_2 formally measure the degree of specialisation dynamics for a trade grouping in a selected period.

[2] Let p be number of zero LFI values that belong to an interval P, q number of negative LFI values belonging to and interval Q and let r be the number of positive LFI values (interval R). Given that the total number of analysed commodities each year is 635, the number of commodities in R is $r = 635 - p - q$. Interval Q is split up into two subintervals as follows. If $q/2 \in N$, then number of values in both subintervals of Q is the same. If $q/2 \notin N$, then the number of values in the first subinterval of Q is a = $[q/2] + 1$ and in the second subinterval is $q - a$, where $[q/2]$ is the integer part of number $q/2$. Interval R is split up into two subintervals as follows. If $r/2 \in N$, then number of values in both subintervals of R is the same. If $r/2 \notin N$, then the number of values in the second subinterval of R is $b = [r/2] + 1$ and in the first subinterval is $r - b$, where $[r/2]$ is the integer part of number $r/2$.

To investigate how specialisation dynamics changed in the period analysed, differences of mobility indices pertaining to the five-year period and one-year period, respectively were computed.

$$\Delta M_1 = M_{15} - M_{11} \quad (9)$$

$$\Delta M_2 = M_{25} - M_{21} \quad (10)$$

where

M_{15} – M_1 pertaining to a five-year period,
M_{11} – M_1 pertaining to a one-year period,
M_{25} – M_2 pertaining to a five-year period,
M_{21} – M_2 pertaining to a one-year period.

Data

Agricultural trade flow data used in the study come from the Statistical Office of the Slovak Republic and cover the period 2000 to 2005. The data were collected under the TRADEAG FP6 project (TRADEAG CEEC data base). Agricultural commodities are classified according to the Harmonised System (HS) and are specified by a six-digit code of HS. Data on nominal yearly exports and imports expressed in Euro were analysed.

Analysed yearly commodity set consisted of 635 commodities for each trade grouping. Out of HS chapters 01 – 24 in the tariff nomenclature, Chapter 03 – Fish and Crustaceans, that primarily represents fisheries, was excluded.

Results

Composition of Slovak Agri-food Trade Flows

Over the period examined, the Slovak agri-food trade with NMS04 followed by trade with the EU-15 comprised the highest shares of Slovak total agri-food trade (Table 1). On the other hand, agri-food trade with the NMS07, CIS and the USA appeared to be of minimum importance for Slovakia. There is an indication of trade creation and trade diversion effects for Slovak agri-food trade after the 2004 EU enlargement. The combined share of agri-food imports from the EU-15 and NMS04 grew up in 2005 in comparison to 2000, while the combined share for NMS07, CIS, USA, and ROW fell down for the same years. This means that agri-food imports from the rest of the world were replaced by the imports from the enlarged EU.

In 2005, compared to the accession year 2004, a higher impact of EU enlargement on Slovak agri-food trade was observed. Total agri-food exports and imports increased by 27 and 30 per cent, respectively. The main reason was

growing trade with other EU Member States (MPSR, 2006). Abolition of tariff and non-tariff barriers in trade with other EU Member States and the introduction of EU common trade policies was accompanied by qualitative changes in composition of Slovak agri-food exports and imports. Figure 1 and Figure 2 provide insights into the development of composition of the Slovak agri-food trade flows with the trade groupings examined. The figures suggest that during the period from 2000 to 2005 Slovak agri-food import was dominated by consumer-oriented products.

T a b l e 1

Slovak Agri-food Exports and Imports by Trade Groupings (%) in 2000 and 2005

	Trade Grouping											
	EU-15		NMS04		NMS07		CIS		USA		ROW	
	export	import	export	import	export	import	export	import	export	import	export	import
2000	22	39	63	44	2	0	7	1	0	1	6	15
2005	31	40	59	50	2	1	3	1	0	1	5	10

Source: Own calculations based on the TRADEAG CEEC database.

The EU-15 share on the Slovak imports of consumer-oriented commodities was growing over the analysed period along with growing domestic demand. On the other hand, composition of agri-food exports to the EU-15 has been stable, which shows less ability of Slovak consumer-oriented exports to penetrate selective EU-15 market. This can also be explained by a high level of agri-food demand saturation in the EU-15 as was pointed out, for instance, by Bartošová, Bartová and Fidrmuc (2007). CEEC can most likely succeed on western markets with agri-food commodities that fill the niche on that market. A typical example is dairy products, demand for which has been growing in the EU.

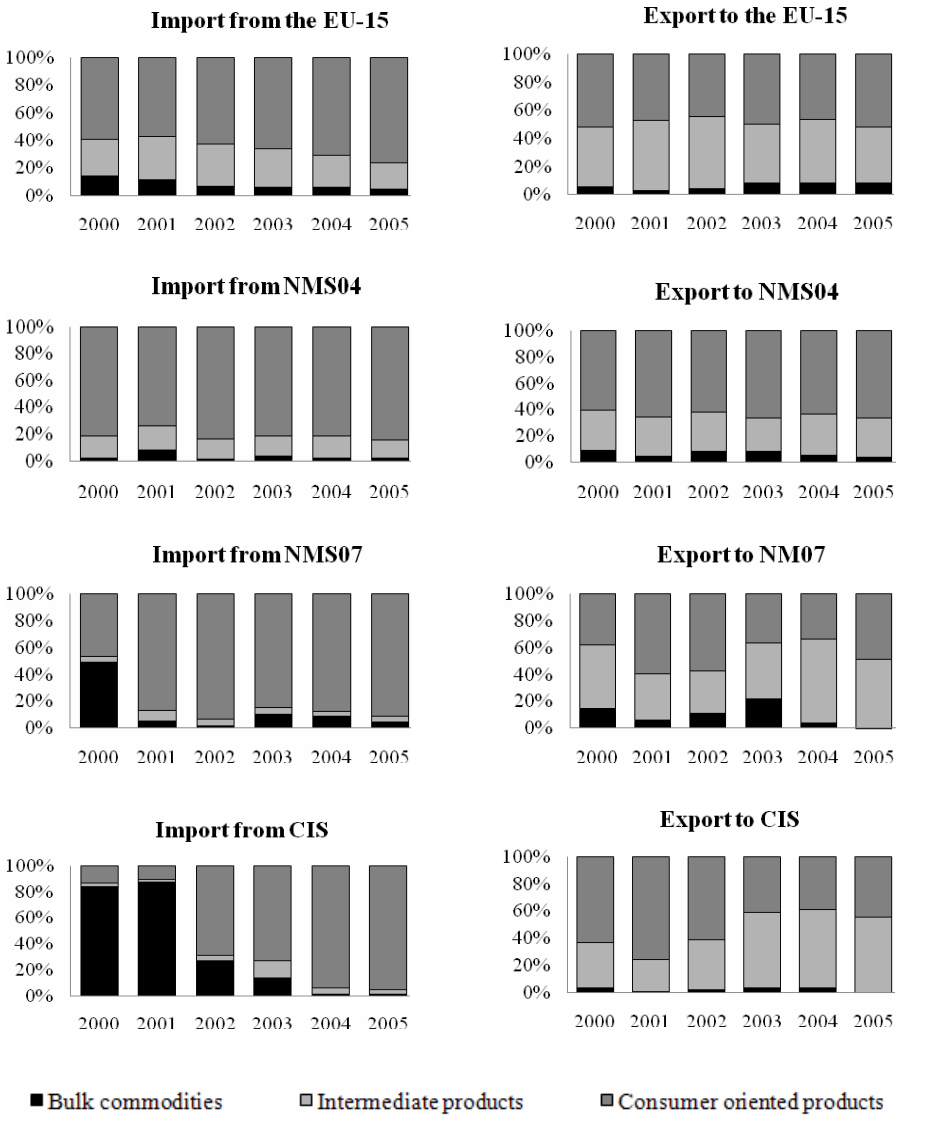
Slovak agri-food imports as well as exports to the NMS04 were dominated by consumer-oriented products to a greater extent than was the case with the EU-15. This may point to higher competitiveness of Slovak agri-food commodities on NMS04 markets than on the EU-15 markets. Low cereals yields in 2000 due to unfavourable weather conditions were reflected in high imports from CIS in 2001.

The most competitive commodities in Slovak agri-food trade in the period 2000 – 2005 by individual trade groupings are listed in Table 2. Despite commodity heterogeneity by trade groupings, live animals, milk products (especially cheese), malt not roasted and beverages belong to the most frequent. During the analysed period, Slovakia granted export subsidies to milk powder, other dairy products, malt, fruits and vegetables (and products thereof), and sugar and confectionary. The first three items were most subsidised, however. Milk and dairy

products have traditionally been a competitive article of Slovak agri-food export, which, at the same time, enjoyed substantial export subsidies. However, in the years to come we may see a change in these commodities' position due to ongoing EU Common Agricultural Policy Reform.

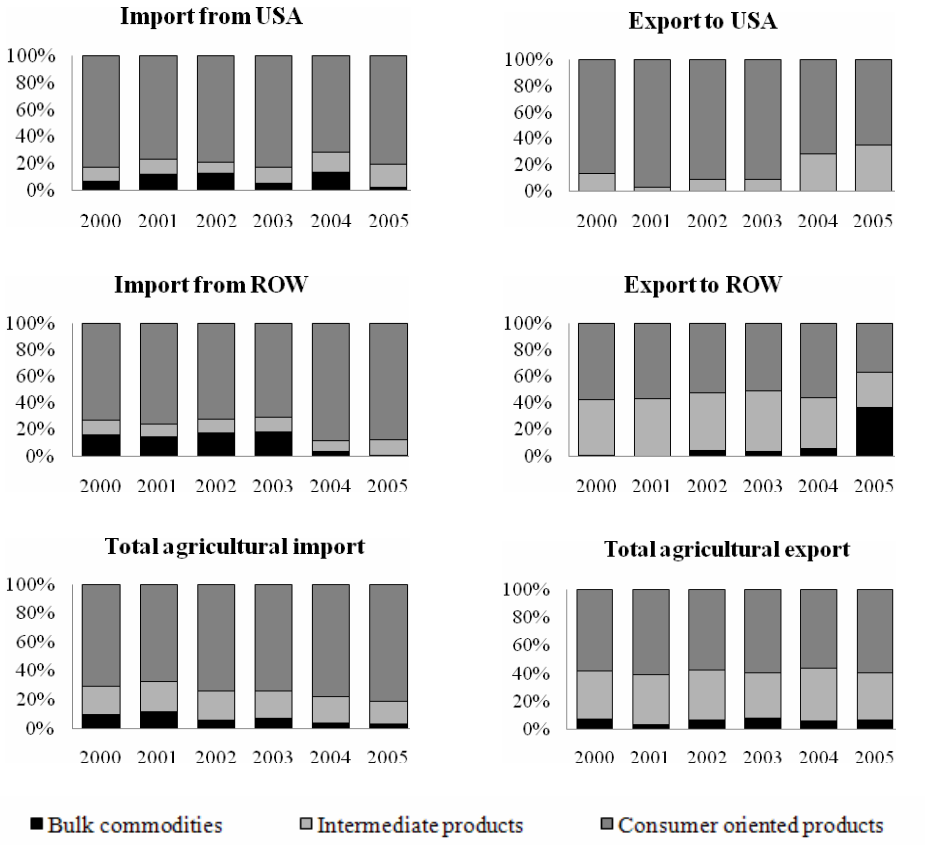
F i g u r e 1

Composition of Slovak Agri-food Trade with the EU-15, NMS04, NMS07 and CIS (2000 – 2005)



Source: Own calculations.

F i g u r e 2
Composition of Slovak Agri-food Trade with USA, ROW and Total Slovak Agri-food Trade



Source: Own calculations.

Most competitive commodities in Slovak agri-food export to the EU-15 are either intermediate or consumer-oriented. Consumer-oriented products dominated in Slovak exports to NMS04. For other trade groupings, the type of most competitive commodities varied. There was no bulk product among commodities, in which Slovakia specialised most in the period 2000 to 2005.

Specialisation Dynamics

The range of Lafay specialisation index values for the Slovak agri-food trade has shrunk at the end of period of observation (after the 2004 EU enlargement) compared to 2000 for trade with all trade groupings but NMS07 and ROW. Trade position of commodities with revealed comparative advantage in 2000 worsened by 2005, while position of commodities in a very weak position at the beginning of the period improved in terms of revealed comparative advantage.

T a b l e 2
Most Competitive Commodities of Slovak Agri-food Trade by Trade Groupings (2000 – 2005)

HS code	Description	HS Code	Description
EU-15			
0102 90	*Live bovine animals – other*	1206 00	*Sunflower seeds*
0402 10	*Milk and cream, fat < 1,5%*	2202 10	*Waters containing added sugar*
0406 90	*Other cheese*		
NMS04			
0401 20	*Milk and cream, 1% < fat < 6%*	1702 30	*Glucose and glucose syrup, not containing fructose*
0406 90	*Other cheese*	1806 31	*Chocolate other, in blocks, slabs or bars*
1107 10	*Malt not roasted*	1905 31	*Sweet biscuits*
NMS07			
0105 11	*Live poultry weighing < 185 g*	1107 10	*Malt not roasted*
0901 21	*Coffee not decaffeinated*	2103 90	*Sauces and preparations therefore – other*
CIS			
0901 21	*Coffee not decaffeinated*	2104 10	*Soups and broths*
1107 10	*Malt not roasted*		
USA			
0106 19	*Mammals – other*	2201 10	*Mineral waters and aerated waters*
0106 90	*Other live animals*	2203 00	*Beer made from malt*
0406 90	*Other cheese*		
ROW			
0102 90	*Live bovine animals – other*	110710	*Malt not roasted*
0402 10	*Milk and cream, fat < 1,5%*	1701 99	*Cane or beet sugar – other*
0406 10	*Fresh cheese, whey cheese, and curd*	2104 10	*Soups and broths*
0406 90	*Other cheese*		
Total Agri-food Trade			
0406 90	*Other cheese*	1806 31	*Chocolate other, in blocks, slabs or bars*
1107 10	*Malt not roasted*	2104 10	*Soups and broths*
1206 00	*Sunflower seeds*	2202 10	*Waters containing added sugar*

Source: Own calculations.

Development of Slovak agri-food trade specialisation pattern was analysed using Markov transition probability matrices (Table 3). The intervals contain LFI values of similar magnitude. Thus, first interval (I_1) represents commodities in which the Slovak Republic had at the time significant competitive disadvantages, meaning that the country was a heavy net importer of these articles. Slovak imports of commodities gathered in the second interval (I_2) also exceeded respective exports, but to a much lesser extent than was the case with I_1. On the other hand, the fifth interval (I_5) commodities were of high competitive advantages meaning that net exports values of such commodities were significantly higher than of those from I_4. The middle interval captures all commodities with none trade in a given year. Taking into account the meaning of individual intervals, a movement of a commodity from I_1 to I_2 during the period analysed can be interpreted as an improvement in the importance of that commodity for Slovak agri-food trade.

A common feature of one-year matrices for the EU-15, NMS04, ROW and total agri-food trade is high probability for the first and fifth interval. This means that Slovak agri-food trade in commodities with these groupings was rather rigid. Trade position of both uncompetitive and competitive commodities has not changed. Respective significantly lower probabilities for NMS07, CIS and USA suggest higher dynamics in agri-food trade specialisation in most uncompetitive and most competitive commodities, respectively. For example, while probability of improvement of an uncompetitive commodity trade position (within one year) in Slovak trade with the EU-15 was approximately 14 per cent, the same probability in trade with the Commonwealth of Independent States was some 39 per cent.

Over a one-year span (Table 3), it was rather difficult for Slovakia to improve trade position of comparatively disadvantageous commodities with regard to trade groupings; but once having obtained a comparative advantage, Slovakia was able to maintain this commodity position over the period analysed.

There have been a limited number of traded commodities between Slovakia and NMS07, CIS and USA, respectively. Composition of exports (imports) to (from) NMS07, CIS and USA was stable. Very few commodities accounted for almost all amount of bilateral agri-food trade with the groupings. Strong trade specialisation with these groupings may be explained by transaction costs as well as bilateral agreements that favoured a limited number of commodities via preferential treatment (e.g. export of Slovak cheese to the USA).

Over a five-year period, significant change of Slovak agri-food trade specialisation by trade groupings was observed (Table 3). There was an increase in the number of mutually traded commodities in Slovak trade with the EU-15, NMS04, ROW and in Slovak total agri-food trade, which, however, made the level of trade specialisation decrease over the period analysed.

Furthermore, the magnitude of the five-year diagonal probabilities leads to the conclusion that over the period analysed trade position of Slovak agri-food competitive commodities worsened while uncompetitive ones improved. This was true especially for the most important trade partners – EU-15 and NMS04, now gathered in EU-27.

Dynamics of previously rigid specialisation in trade with the EU-15 and NMS04 has been accelerating since accession of Slovakia to EU. This is likely to lead to convergence in speed of trade specialisation dynamics across individual trade groupings (Table 4).

Complementary results in Table 5 present average transition matrices for the pre- and post-accession period for two most important Slovak trade partners: EU-15 and NMS04. Despite a short post-enlargement period of observation, mobility indices reveal higher dynamics of trade specialisation after the 2004 EU enlargement. Similarly, Slovak agri-food trade patterns with NMS04 evolved

more dynamically than trade patterns with EU-15. Changes of agricultural trade policies should be reflected in the changing trade patterns. Therefore, abolition of tariff and non-tariff barriers with NMS04, which were on average higher than with the EU-15 can be one of main determinants of higher dynamics of Slovak agri-food trade with NMS04 compared to the EU-15.

Discussion and Conclusions

The paper analyses development of Slovak agri-food trade specialisation in the period 2000 to 2005. The share of consumer-oriented (high value) products had been high in trade with most trade groupings. Moreover, it has been growing in agri-food trade with the EU-15.

High share of agri-food trade in consumer-oriented products suggests presence of intra-industry trade that is based more on product specifics than on comparative advantages. A differentiated character of these products may explain a significant position of some of them (e.g. cheese) on all export markets – they fill out the niches on foreign markets.

Slovak agri-food trade with NMS07, CIS and the USA revealed rather high degree of specialisation. Trade with the EU-15, NMS04 and ROW was specialised to a lesser extent. Specialisation in the majority of the most successful commodities drop over the period analysed. Slovakia did not maintain positions of its competitive commodities, however the positions of a number of previously uncompetitive commodities improved.

There has been decreasing Slovak agri-food trade specialisation especially in trade with the EU-15. It confirms continuing decrease in extent of CEECs agri-food export specialisation observed by Fertö and Hubbard (2003) and an empirical evidence (e.g. Wörz, 2005; Borbély, 2006) of a global tendency in decreasing of trade specialisation.

Slovak agri-food trade pattern however is still evolving and adapting to new conditions. Given that comparative advantages are evolving over time, a stable pattern of agri-food trade specialisation cannot be expected.

In the pre-enlargement period, Slovak domestic agri-food markets were protected significantly higher than manufacturing goods markets. This should therefore be reflected in different trade specialisation dynamics. Zaghini (2005) reports for total Slovak trade and one-year period mobility indices $M_1 = 0.328$ and $M_2 = 0.713$; and for the whole period 1993 – 2001 $M_1 = 0.526$ and $M_2 = 0.950$. Comparison of these figures with the ones presented in Table 4 for total Slovak agri-food trade hints that high protection of imports can matter in the dynamics of trade specialisation.

T a b l e 3
Transition Matrices (2000 – 2005)

1-year Transition Matrix						5-year Transition Matrix					
EU-15											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.858	0.090	0.009	0.020	0.023	I_1	0.778	0.111	0.000	0.039	0.072
I_2	0.123	0.718	0.089	0.055	0.014	I_2	0.213	0.671	0.053	0.039	0.024
I_3	0.032	0.268	0.639	0.051	0.009	I_3	0.127	0.461	0.304	0.108	0.000
I_4	0.086	0.271	0.087	0.479	0.078	I_4	0.169	0.373	0.034	0.305	0.119
I_5	0.062	0.021	0.004	0.133	0.780	I_5	0.183	0.117	0.000	0.200	0.500
NMS04											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.790	0.097	0.005	0.035	0.073	I_1	0.656	0.125	0.013	0.075	0.131
I_2	0.113	0.607	0.093	0.163	0.024	I_2	0.188	0.469	0.088	0.194	0.063
I_3	0.018	0.155	0.707	0.115	0.005	I_3	0.082	0.265	0.500	0.143	0.010
I_4	0.050	0.248	0.110	0.481	0.110	I_4	0.130	0.407	0.083	0.250	0.130
I_5	0.100	0.040	0.003	0.095	0.761	I_5	0.147	0.064	0.000	0.220	0.569
NMS07											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.680	0.089	0.181	0.011	0.039	I_1	0.667	0.074	0.185	0.074	0.000
I_2	0.108	0.253	0.614	0.025	0.000	I_2	0.111	0.222	0.519	0.037	0.111
I_3	0.009	0.026	0.928	0.024	0.013	I_3	0.021	0.053	0.833	0.055	0.038
I_4	0.017	0.049	0.358	0.437	0.139	I_4	0.037	0.000	0.593	0.222	0.148
I_5	0.049	0.044	0.199	0.064	0.645	I_5	0.185	0.111	0.111	0.074	0.519
CIS											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.611	0.117	0.153	0.074	0.045	I_1	0.440	0.080	0.120	0.040	0.320
I_2	0.115	0.324	0.341	0.149	0.071	I_2	0.208	0.208	0.417	0.083	0.083
I_3	0.009	0.021	0.895	0.054	0.021	I_3	0.012	0.042	0.871	0.057	0.018
I_4	0.016	0.041	0.413	0.442	0.088	I_4	0.079	0.071	0.452	0.294	0.103
I_5	0.031	0.014	0.136	0.158	0.661	I_5	0.063	0.056	0.206	0.214	0.460
USA											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.694	0.167	0.118	0.011	0.011	I_1	0.734	0.109	0.109	0.031	0.016
I_2	0.162	0.384	0.377	0.047	0.030	I_2	0.175	0.317	0.349	0.111	0.048
I_3	0.012	0.042	0.918	0.021	0.007	I_3	0.019	0.084	0.855	0.027	0.015
I_4	0.009	0.115	0.422	0.294	0.160	I_4	0.000	0.125	0.250	0.188	0.438
I_5	0.044	0.023	0.121	0.086	0.725	I_5	0.125	0.000	0.250	0.063	0.563
ROW											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.828	0.097	0.018	0.021	0.037	I_1	0.767	0.167	0.017	0.022	0.028
I_2	0.114	0.567	0.115	0.146	0.058	I_2	0.162	0.547	0.095	0.128	0.067
I_3	0.027	0.189	0.684	0.087	0.013	I_3	0.103	0.336	0.440	0.095	0.026
I_4	0.079	0.400	0.186	0.268	0.066	I_4	0.175	0.400	0.100	0.200	0.125
I_5	0.094	0.151	0.046	0.096	0.614	I_5	0.188	0.113	0.025	0.188	0.488
Total Agri-food Trade											
	I_1	I_2	I_3	I_4	I_5		I_1	I_2	I_3	I_4	I_5
I_1	0.851	0.084	0.002	0.029	0.034	I_1	0.766	0.134	0.000	0.030	0.070
I_2	0.113	0.743	0.056	0.081	0.008	I_2	0.155	0.660	0.050	0.100	0.035
I_3	0.030	0.233	0.663	0.069	0.005	I_3	0.105	0.474	0.263	0.140	0.018
I_4	0.074	0.265	0.051	0.518	0.092	I_4	0.170	0.409	0.034	0.341	0.045
I_5	0.068	0.031	0.002	0.120	0.779	I_5	0.236	0.045	0.000	0.146	0.573

Note: $I_{1, 2, 3, 4, 5}$ stands for interval of comparative advantage.

Source: Own calculations.

Changes in the structure and dynamics of the Slovak agri-food trade can be explained by the implementation of EU policies in the New Member States. Gradual agri-food trade liberalisation with the EU-15 before accession, mutual CEEC trade liberalisation after accession and insufficient producers' flexibility to changing environment affected the pattern of agri-food trade specialisation. Changes in WTO commitments and reform of the Common Agricultural Policy (CAP) of the EU also contributed to the structural changes.

T a b l e 4

Indices of Mobility

	One Year[1]		Five Years[2]		Change in Specialisation Dynamics	
	M_{11}	M_{21}	M_{15}	M_{25}	ΔM_1	ΔM_2
EU-15	0.381	0.874	0.610	0.985	0.229	0.111
NMS04	0.413	0.905	0.639	0.996	0.226	0.092
NMS07	0.514	0.963	0.634	0.992	0.120	0.030
CIS	0.517	0.959	0.682	0.994	0.165	0.035
USA	0.496	0.961	0.586	0.991	0.090	0.030
ROW	0.510	0.972	0.640	0.994	0.130	0.022
Total Agri-food Trade	0.361	0.852	0.599	0.983	0.238	0.131

Note: [1] Calculations based on the average of one-year matrices.
[2] Calculations based on matrix evaluating the trade dynamics between 2000 – 2001 and 2004 – 2005.

Source: Own calculations.

T a b l e 5

Dynamics of Agri-food Trade Specialisation in the Pre- and Post Enlargement Period

	Average Matrix 2000 – 2003					Average Matrix 2004 – 2005				
EU-15	0.874	0.084	0.008	0.015	0.018	0.796	0.098	0.004	0.028	0.074
	0.106	0.708	0.103	0.066	0.017	0.105	0.611	0.087	0.168	0.028
	0.025	0.211	0.709	0.043	0.012	0.022	0.147	0.697	0.127	0.009
	0.055	0.264	0.094	0.515	0.072	0.049	0.225	0.097	0.533	0.096
	0.045	0.012	0.006	0.122	0.815	0.084	0.042	0.000	0.077	0.797
	$\boldsymbol{M_1}$	0.345	$\boldsymbol{M_2}$	0.839		$\boldsymbol{M_1}$	0.392	$\boldsymbol{M_2}$	0.884	
NMS04	0.835	0.098	0.009	0.028	0.030	0.781	0.096	0.006	0.046	0.071
	0.148	0.734	0.068	0.040	0.010	0.125	0.602	0.100	0.155	0.018
	0.043	0.354	0.534	0.064	0.005	0.012	0.168	0.722	0.098	0.000
	0.131	0.283	0.075	0.424	0.087	0.053	0.282	0.130	0.403	0.132
	0.088	0.034	0.000	0.149	0.729	0.124	0.037	0.009	0.123	0.706
	$\boldsymbol{M_1}$	0.436	$\boldsymbol{M_2}$	0.916		$\boldsymbol{M_1}$	0.4465	$\boldsymbol{M_2}$	0.933	

Source: Own calculations.

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