

# Different Integration Paths and East-West Agro-Food Trade

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## 1. Introduction

We investigate whether different integration paths to the European Union (EU) membership have caused differences in East-West agro-food trade. So far there is limited research available to investigate agro-food trade types classifying them into various components between different East European transition countries with the EU member countries. The East European countries during the last fifteen years have undergone transition from central planning to a market economy and few of them rapid adjustments to the EU membership. However, the East European group is not uniform. We have selected for our in-depth analysis the following four Mediterranean Central and South-Eastern European countries: Slovenia that entered into the EU in 2004, Bulgaria and Romania that entered the EU in 2007, and Croatia the former Yugoslav republic, which is still outside the EU membership. We expect that different paths of integration, including free trade and association agreements, and the EU membership might have induced differences in structures and sustainability of trade types. Geographically, the selected countries are situated or are bordering Mediterranean South-Eastern European region. We investigate their trade with the EU-15 countries during the period 1995-2003 to establish an empirical evidence of whether there might be any catching up in these processes. The second section presents methodology and data used. In the third section we present empirical results. The final section concludes.

## 2. Methodology and data used

Unit values of exports and imports by products have been often used for assessing price competitiveness and product quality in two-way matched trade data (Abd-el-Rahman, 1991; Aiginger, 1997; Ulff and Nielsen, 2000). Additionally, the trade balance by product that indicates successful or unsuccessful competition in trade is simultaneously used to categorize trade flows in four competition categories (Gehlhar and Pick, 2002; Bojnec and Fertő, 2007):

Category 1: the home country is successful in price competition.

Category 2: the home country is unsuccessful in price competition.

Category 3: the home country is successful in quality competition.

Category 4: the home country is unsuccessful in quality competition.

The East European countries are used as the home country and the EU countries are used as the partner country. We additionally disentangle the one-way (export or import) trade from the two-way matched trade.

We study catch up in patterns of trade specialization focusing on the stability of the trade competition categories for particular product groups. This is analyzed in two ways. First, we employ Markov transition probability matrices to investigate the changes in the trade competition categories focusing on the price competition and quality competition categories over the time. Second, the degree of mobility in patterns of trade competition categories is summarized using indices of mobility. More specifically, we use M1 index, following Shorrocks (1978), that evaluates the trace ( $\text{tr}$ ) of the transition probability matrix. This M1 index thus directly captures the relative magnitude of diagonal and off-diagonal terms, and can be shown to equal the inverse of the harmonic mean of the expected duration of remaining in a given cell:

$$M_1 = \frac{K - \text{tr}(P)}{K - 1}$$

where  $K$  is the number of cells, and  $P$  is the Markov transition probability matrix. In  $M_1$  indices, a higher value indicates greater mobility, with a value of zero indicating perfect immobility.

We use detailed trade data from OECD by the years 1995-2003. Agro-food trade by EU-Commission (1999) is defined in a way that sample consists of 255 items at four-digit level in Standard International Trade Classification (SITC) system.

### 3. Empirical results

We first present the level and patterns in agro-food trade between the selected Mediterranean Central and South-Eastern European (MCSEE) countries and the EU-15 (Table 1). Between 1995 and 2003 the analyzed MCSEE agro-food exports to the EU-15 have increased, whereas their imports from the EU-15 have increased for Croatia and Romania, but not for Bulgaria and Slovenia. Bulgaria increased its agro-food surplus with the EU-15 slightly. The reduction in agro-food trade deficit with the EU-15 is observed for Croatia, for Slovenia and particularly for Romania. Agro-food trade between the MCSEE and EU-15 has become more stable indicating that major trade reorientations occurred in the initial stage of transition and that later on trade developments and trade specialization are more in line with factors determining comparative trade advantages and trade competitiveness.

Table 1: The agro-food trade between Mediterranean Central and South-Eastern European countries and the EU-15 (millions dollars)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
<i>Exports</i>									
Bulgaria	336.0	314.3	309.0	307.9	315.4	225.6	259.9	398.0	390.8
Croatia	249.0	240.6	208.8	214.2	210.6	198.1	224.5	286.4	410.3
Romania	205.3	212.1	232.2	235.5	382.9	337.9	367.4	370.4	519.4
Slovenia	176.2	165.8	158.1	170.6	169.2	154.0	137.4	153.8	187.9
<i>Imports</i>									
Bulgaria	333.2	218.2	214.3	265.8	210.3	234.4	255.4	259.5	324.6
Croatia	592.6	551.7	513.3	433.8	361.2	361.2	431.9	532.9	668.5
Romania	413.0	421.8	309.2	432.8	271.2	291.6	391.0	475.8	592.5
Slovenia	567.5	547.5	518.0	521.7	510.3	466.9	453.3	481.4	546.5
<i>Trade balance</i>									
Bulgaria	2.7	96.0	94.7	42.1	105.1	-8.8	4.5	138.5	66.2
Croatia	-343.6	-311.2	-304.5	-219.6	-150.6	-163.2	-207.3	-246.5	-258.2
Romania	-207.7	-209.7	-77.0	-197.2	111.7	46.3	-23.6	-105.4	-73.1
Slovenia	-391.3	-381.7	-360.0	-351.1	-341.1	-312.9	-315.9	-327.6	-358.6

Source: Own calculations based on OECD database.

When simultaneously comparing trade balance by a product as a proxy for successful competition in trade and unit export-import values as proxies for price competition by the same product, we identify in the pairs of bilateral agro-food trade by products the one-way trade flows (only exports or only imports) and the matched two-way trade flows. Within the matched two-way trade flows we identify categories of price competition and categories of quality competition where simultaneously exist trade balance by a product and unit export-import values for the same product.

Table 2 for Croatia shows that the majority of agro-food trade with the EU-15 is in the matched two way trade, which as expected over time is further increasing due to trade creation encouraged by trade liberalisation and economic growth. Imports represent almost all one-way trade suggesting that there is almost no any specific product, which Croatia can offer

to the EU-15 that is not produced in these countries. In the structure of two-way trade, the successful quality competition (category 3) initially was relatively at low level, but considerably increased during the recent years suggesting quality improvements in the Croatian agro-food sector. On the other hand, there are variations in the successful price competition (category 1), which tends to deteriorate during the recent years. The initially the most significant single category 2 of the unsuccessful price competition has declined over time, whereas the unsuccessful quality competition (category 4) has remained at similar relative levels. Therefore, the results for Croatia shows that the most significant successful catching up is observed for the successful quality competition, which is particularly at the expense of reduction in the unsuccessful and to a lesser extent of successful price competition. The former two represents Croatian agro-food competitive trade improvements over time, whereas the latter deterioration in price competition in the EU-15 markets.

Table 2: Croatian Agro-Food Trade Types with the EU-15 (in %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-way	15.9	22.1	19.1	15.9	14.1	13.9	8.6	9.9	8.5
Two-way	84.1	77.9	80.9	84.1	85.9	86.1	91.4	90.1	91.5
<i>One-way</i>									
Exports	0.3	0.2	0.1	0.2	1.6	0.7	0.6	1.1	0.3
Imports	99.7	99.8	99.9	99.8	98.4	99.3	99.4	98.9	99.7
<i>Two-way</i>									
Category 1	28.6	32.8	30.8	36.3	36.9	35.0	28.2	28.6	24.0
Category 2	36.2	38.2	36.9	28.9	27.1	33.7	27.6	28.9	24.3
Category 3	5.1	5.1	4.7	3.2	4.7	6.2	11.7	11.6	21.4
Category 4	30.1	24.0	27.5	31.6	31.3	25.2	32.5	30.9	30.3

Source: Own calculation based on OECD database

Table 3: Slovenian Agro-Food Trade Types with the EU-15 (in %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-way	19.8	16.7	14.6	8.1	18.9	16.7	16.4	13.6	13.2
Two-way	80.2	83.3	85.4	91.9	81.1	83.3	83.6	86.4	86.8
<i>One-way</i>									
Exports	0.4	0.2	0.0	0.2	0.1	0.1	0.1	0.2	0.5
Imports	99.6	99.8	100.0	99.8	99.9	99.9	99.9	99.8	99.5
<i>Two-way</i>									
Category 1	14.1	19.3	16.1	13.5	16.3	21.1	20.6	19.6	17.6
Category 2	37.3	39.7	33.5	33.8	29.4	39.9	32.7	45.3	34.6
Category 3	9.1	3.1	6.2	8.7	8.6	4.5	3.3	4.7	8.2
Category 4	39.5	37.8	44.2	44.0	45.7	34.5	43.4	30.4	39.6

Source: Own calculations based on OECD database.

The two-way trade prevails and tends to increase also in Slovenian agro-food trade with the EU-15. Almost all one-way agro-food trade is imports from the EU-15 to Slovenia clearly indicating that there is a rare specific agro-food product that Slovenia can exports and offers that is not produced in the EU-15 countries. The most striking finding is based on the structures of two-way competition categories where the strong prevailing significance is on the unsuccessful price (category 2) and unsuccessful quality competition (category 4). The successful price (category 1) and successful quality competition (category 3) represent only around one-fourth of the matched two-way agro-food trade of Slovenia with the EU-15. The results confirm a lack of Slovenian agro-food comparative trade advantages and international price and quality competitiveness on the EU-15 markets.

Table 4: Bulgarian Agro-Food Trade Types with the EU-15 (in %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-way	16.8	12.4	17.1	16.4	14.4	13.7	24.0	14.5	14.5
Two-way	83.2	87.6	82.9	83.6	85.6	86.3	76.0	85.5	85.5
<i>One-way</i>									
Exports	12.5	12.8	5.2	1.4	26.9	2.3	20.9	29.7	19.8
Imports	87.5	87.2	94.8	98.6	73.1	97.7	79.1	70.3	80.2
<i>Two-way</i>									
Category 1	34.2	42.6	46.6	42.0	28.7	37.2	36.8	47.3	44.7
Category 2	11.6	7.9	8.1	12.9	9.1	10.6	15.4	15.3	13.0
Category 3	28.7	26.3	28.1	25.4	41.1	22.8	25.0	20.1	20.6
Category 4	25.5	23.2	17.1	19.6	21.1	29.4	22.8	17.2	21.8

Source: Own calculations based on OECD database.

The structures of one-way and two-way trade do not differ significantly from the previous two for Bulgaria (Table 4). Two-way trade prevails in agro-food trade between Bulgaria and the EU-15, but within the one-way trade there is greater significance of exports, which tend to increase suggesting presence of specific product comparative advantages in Bulgarian agro-food exports to the EU-15. As most striking, in the structure of two-way agro-food trade the Bulgarian successful price competition (category 1) is the most significant single category, which tends to increase further, but relatively lower significance of the unsuccessful price competition (category 2), which also tends to increase over time. The significance of successful (category 3) and unsuccessful quality competition (category 4) with some variations over time tend to decline. However, almost around two-third of Bulgarian two-way matched agro-food trade with the EU-15 can be classified as the successful price and successful quality competition.

Table 5: Romanian Agro-Food Trade Types with the EU-15 (in %)

	1995	1996	1997	1998	1999	2000	2001	2002	2003
One-way	31.4	23.5	22.4	36.1	13.5	21.3	16.0	24.7	10.9
Two-way	68.6	76.5	77.6	63.9	86.5	78.7	84.0	75.3	89.1
<i>One-way</i>									
Exports	1.4	7.7	22.4	8.2	17.5	13.0	30.1	27.1	7.1
Imports	98.6	92.3	77.6	91.8	82.5	87.0	69.9	72.9	92.9
<i>Two-way</i>									
Category 1	31.8	30.1	40.7	41.6	55.4	51.3	38.5	35.8	45.4
Category 2	17.4	23.0	27.3	20.5	7.3	10.8	32.3	26.9	34.0
Category 3	18.3	13.1	11.7	11.1	10.7	16.2	16.6	13.9	7.7
Category 4	32.5	33.8	20.3	26.8	26.7	21.7	12.6	23.4	12.9

Source: Own calculations based on OECD database.

The significance of one-way trade was initially more important for Romanian agro-food trade with the EU-15 (Table 5), but deteriorated over time. The one-way export for some years is rather significant, but varies and is unsustainable over time. Similarly to Bulgaria, the successful price competition is the most significant competition category in two-way matched agro-food trade. The unsuccessful price competition (category 2) is less significant, but tends to increase over time. There is decline in significance in the unsuccessful quality competition (category 4) as well as in the successful quality competition (category 3), which is becoming less significant in Romanian agro-food trade with the EU-15. The Romanian successful agro-food price competition (category 1) is related to specific Romanian agricultural comparative advantages in wood and livestock production, whereas deterioration in the successful quality

competition is likely to be related to difficulties in restructuring of food processing industries to improve quality and to comply with the EU quality, marketing and other standards.

Table 6: Mobility Indices (M1)

	1995-2003	1995-1999	1999-2003
Bulgaria	0.48	0.59	0.50
Croatia	0.51	0.49	0.43
Romania	0.48	0.61	0.59
Slovenia	0.50	0.55	0.56

Source: Own calculation based on OECD database.

Table 6 presents summary statistics on the size of mobility indices, which are calculated for the patterns in bilateral agro-food trade flows. Except for Slovenia, the size of the mobility indices for the first period (1995-1999) is greater than for the second period (1999-2003) indicating the decline in mobility of competition trade categories and more stable trade patterns in the second period with fewer movements between trade competition categories. By the sub-periods, the size of the mobility indices is the lower for Croatia, but at the same time the higher for the analyzed period as a whole. Croatia among the analyzed countries was the last one that entered into the negotiation process for EU membership. The paths of other three countries, i.e., Bulgaria, Romania and Slovenia was more similar before the first wave of the EU-25 enlargement towards the east, when only Slovenia from the analyzed group on 1<sup>st</sup> May 2004 became the member of the enlarged EU-25. However, both Bulgaria and Romania in agro-food trade with the EU have experienced similar dynamics and adjustment patterns.

#### 4. Conclusions

We have analyzed trade competitiveness categories using export-import unit values and net directions of trade. Only Bulgaria experienced agro-food trade surplus with the EU-15, whereas Croatia, Romania and Slovenia reduced agro-food trade deficit slightly. The two-way agro-food trade is more significant than the one-way trade. The increase in two-way agro-food trade is consistent with trade liberalisation and economic growth. Trade creation provides opportunities to explore economies of scale in production and to diversify product quality varieties, which are demand by the increasing consumers' incomes in the enlarged EU. However, within the two-way trade, there are differences in the significance of competition categories by countries. Croatia experienced catching up in successful quality competition, but deterioration in successful price competition and insignificant role of one-way exports. Slovenia only slightly experienced catching up in successful price competition, but not in successful quality competition. Similar as for Croatia, the role of one-way exports is insignificant in Slovenian agro-food exports to the EU. Bulgaria has made a greater progress in catching up in successful price competition as well as improvements in one-way exports, but not in successful quality competition. Similar as Bulgaria, Romania has made catching up in successful price competition and to a lesser extent a progress has been achieved in one-way exports, but there is a considerable deterioration in successful quality competition. The analyzed MCSEE countries have experienced difficulties to increase and sustain successful quality competition and one-way exports to the EU-15, which is also revealed by Markov transition probability matrices. The mobility indices indicate two different integration paths, more similar between Bulgaria and Romania to Slovenia, then between Slovenia and Croatia as the former Yugoslav republics. This indicates that policy changes and EU integration paths with associated agricultural and food processing restructuring do matter when explaining the most recent East-West agro-food trade developments.

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