Goran Buturac*, Željko Lovrinčević*, Davor Mikulić*

EXPORT COMPETITIVENESS
OF THE CROATIAN FOOD INDUSTRY

The main aim of the paper is to assess the international competitiveness of the Croatian food industry by deploying the Constant Market Share (CMS) analysis. The CMS model is able to quantify the export performance of the food industry compared to the rest of the world and individual foreign markets (the EU 27, new member states). The analysis revealed rather disappointing results in terms of the competitive position of the Croatian food industry in the period after 2010. The CMS was able to decompose change in the market share based on the geographic and product component and competitiveness effect, and the results confirmed the hypothesis that the loss in competitiveness of the Croatian food industry is the most important factor which determined the decreasing share of Croatian companies in world trade. The impact of the product mix of exported food products was neutral while its geographical effect was also negative. A regional reorientation of exports to more dynamic markets is an option which could boost the exports of the Croatian food industry.

Keywords: Croatian food industry, export competitiveness, CMS analysis, the EU
JEL Classifications: F 10, C 60
DOI: 10.15611/aoe.2018.2.06

1. INTRODUCTION

The promotion of the competitiveness of the European Union (EU) in global markets is recognized as an integral part of the EU's 2020 strategy (European Commission, 2010). In a globalized economy, openness and international trade are crucial elements of development strategies. This is especially important for Croatia which is a typical small economy with limited domestic demand. The growth of international competitiveness and export orientation could significantly contribute to economic growth and employment. This paper evaluates the international competitiveness of an important sector of the Croatian economy – the food industry.

Export orientation provides many positive impacts on the domestic economy. It enhances productivity of the national economy through specialization and integration. Exports push the expansion of the domestic

---

* Department for Economic Growth Institute of Economics, Zagreb, Croatia.

market through the demand channel and induce an increase of production, employment, wages and other income benefits. Economic literature recognizes many channels through which exports positively contribute to the domestic economy. Competition in the international market requires greater production efficiency (Krueger, 1980). Exports promote specialization and economies of scale, enterprises engaged in exports tend to introduce technical progress, the spillover effects for the rest of the economy and to help overcome external growth constraints (Grossman and Helpman, 1991).

The production of food products is one of the most important Croatian industries. The strengthening of the export competitiveness of the Croatian food industry is a precondition of its development. The main aim of the paper is to assess the international competitiveness of the Croatian food industry by deploying the Constant Market Share (CMS) analysis. Over the last twenty years, the Croatian food industry has experienced significant structural adjustments and changes. These processes have been additionally spurred on by the EU accession process and the emergence of the global economic crisis. Recent trends on global markets are characterized by a decrease in demand and the strengthening of competitive pressures. The analysis begins with an overview of the basic indicators and trends followed by a CMS analysis. The export performance of the Croatian food industry applying the CMS method is analysed for the global market and segmented international markets (CEFTA[1], EU 15[2] and NMS 12[3]).

After the introduction, a short literature review on the trends and determinants of the international competitiveness of the food industry is given in chapter 2. Chapter 3 presents empirical evidence of the Croatian food industry, while a description of the method and sources are presented in chapter 4. The most important part of the paper presents the results and sources of the international competitiveness of the Croatian food industry.

---

[1] CEFTA is the abbreviation for Central European Free Trade Agreements. As of 1 May 2007, the parties of the CEFTA agreement are: Albania, Bosnia and Herzegovina, Croatia, Macedonia, Moldova, Montenegro, Serbia and UNMIK on behalf of Kosovo.

[2] The EU 15 countries are: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

[3] NMS 12 is the abbreviation for the new member states of the EU. The NMS 12 countries are: Bulgaria, the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

2. LITERATURE REVIEW

The competitiveness of the food industry has been the subject of many articles in recent literature. The studies mainly employ similar theoretical backgrounds and methodologies, but differ in the set of countries and periods included in the analyses. The most comprehensive recent article (Bojnec and Fertö, 2015) investigates the competitiveness of the agri-food exports of EU countries in the global markets over the 2000-2011 period. Panel unit root tests, mobility index and the Kaplan-Meier survival rates of the B index are used, and the authors found a comparative disadvantage of the food industry for most EU countries in the global markets. The most successful EU economies regarding international competitiveness in food products are the Netherlands, France and Spain. Carraresi and Banterle (2015) assessed the competitiveness of various European countries at the level of the food industry sector in the 1995-2011 period and found a similar tendency in most countries, while a significant increase of competitiveness was present in Germany and Austria. The international competitiveness of the Danube countries is explored in Ignjatijević et al. (2015) who used the standard RCA (revealed comparative advantage) Balassa index and TPI (trade performance indexes) and concluded that the distribution of the RCA index in Bosnia and Herzegovina, Hungary, Moldova and Slovenia deviates from the norm. They also found a strong correlation of the RCA index of the Czech Republic with Romania, Hungary with Moldova and Serbia, Moldova with Serbia and Bulgaria with the Ukraine. For the Croatian economy a reduction in competitiveness was discovered.

Bojnec and Fertö (2007) used the Balassa index in order to investigate the level of the competitiveness of the food industry of Hungary, Croatia and Slovenia and concluded that the most important comparative advantage in the export of food products in the EU market has been achieved by Hungary and Croatia, while Slovenia lagged behind.

Besides studies which include a set of economies, there are many surveys which are primarily concerned with the competitiveness of the food industry in only one economy. Majkovič et al. (2006) found that Slovenia had a positive comparative advantage in the export of meat, dairy products and beverages. The authors also pointed out the importance of the positive effect of restructuring the agricultural and food sector. Ishchukova and Smutka (2013) also applied the Balassa and Lafay indices to estimate the comparative advantage of the Russian food industry in the 1998-2010 period. They concluded that primary products had a positive comparative advantage in the EU market.

A comparative analysis of the comparative advantage of the export of Romanian agricultural and food products indicated a declining trend of specialization in international trends for the majority of Romanian products (Rusali, 2013). Prochazka and Smutka (2012) applied the Balassa methodology on the Czech food industry and found the presence of Czech poppy seed in the EU market and an increase in production and export. Czech exports of agricultural products, according to Belova et al. (2012), and Svatoš and Smutka (2012), maintained a positive level of competitiveness in the markets of the EU and third world countries during the economic crisis no significant deterioration in competitiveness due to the global economic crisis was found. Foreign trade of food products in Hungary (Török and Jambor, 2013) has become more intensive after the accession while product and market orientation has not changed significantly since joining. They also found a serious deterioration in the NMS agri-food trade balance in most cases and a high level of persistency of export concentration by country and by product. Jambor et al. (2012) confirmed that the revealed comparative advantages of the Hungarian food industry have weakened after the accession and that the vast majority of products had a revealed comparative disadvantage after 2004. The accession has radically changed the survival time of agri-food trade.

Ignjatijević et al. (2013) found that Romania and Bulgaria have a comparative advantage in the export of primary agricultural products while Austria, Germany, Hungary, the Czech Republic, Slovakia, Slovenia and Ukraine have the advantage in the production and export of primary industrial products.

Raičević et al. (2012) have stressed that the Serbian food industry is only partly integrated into the international market. Comparative advantages are found in the production of sugar, mineral water, beer, ice cream and other frozen compounds, soft drinks, biscuits, the production and preservation of fruit and vegetables, raw oils and fats and the production, processing, cooling and freezing of poultry and rabbit meat.

The international competitiveness of the Croatian food industry has not been investigated in detail in recent literature. The competitiveness of the processing industry of Croatia was assessed in Buturac (2013) who concluded that there is a decline in the competitive advantage of the processing industry as a whole. Applying standardized indicators of export competitiveness, Buturac and Vizek (2014) concluded that the Croatian food

industry has the best position in the CEFTA market. There was the largest number of the products with comparative advantages, the highest level of export diversification and a relative and absolute trade surplus. Sectoral studies of the international competitiveness of Croatian industries using the CMS analysis were conducted for the wood and textile industries (Buturac et al., 2014; Lovrinčević et al., 2015). The study of the food industry as the most important Croatian manufacturing industry can give a better insight into the sources and determinants of the overall national international competitiveness.

3. EXPORT TRENDS OF THE CROATIAN FOOD INDUSTRY

The basic human needs for food and water determine the food processed industry as a strategic industry in most countries of the world. The importance of the food industry for Croatian industrial development is huge. Beside the effects on GDP, employment and export, the food industry induces the development of other economic sectors, especially agriculture and tourism. The traditions in business activity, quality of human resources, visibility of domestic food brands on international markets, inelasticity of demand in the circumstances of recession and high-quality of raw-materials are some of the main features of the Croatian food industry. Due to its relatively small domestic market, the orientation on international markets is extremely important for the Croatian food industry. The last twenty years were characterized by a process of accelerated opening and integration of the Croatian food industry into international markets.

Export orientation, measured by the export share in gross value added, shows an improvement in the period 2001-2012 (Figure 1). The relatively weak domestic demand and highly competitive market are factors which contributed to the reorientation of Croatian food producers to international markets. In the period 2001-2012, the export share in gross value added for food products increased from 48.1 percent to 64.9 percent. At the same time the export share for beverages increased from 23.4 percent to 35.5 percent.

Croatia's exports of processed food were EUR 676.3 million in 2013, while exports of beverages was EUR 101.6 million. The insight into the aggregate export structure confirms the significant role of the processed food sector for total export activities. Between 2001 and 2013, the export share of the food processed industry in the aggregate Croatia's exports increased from 6.4 percent to 8.5 percent (Figure 2).
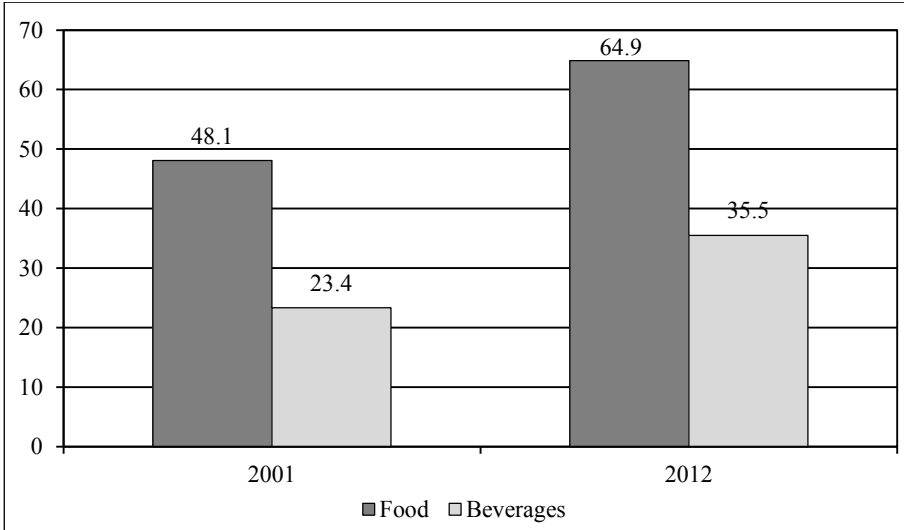
Figure 1. Export orientation – (exports divided by gross value added, in %)

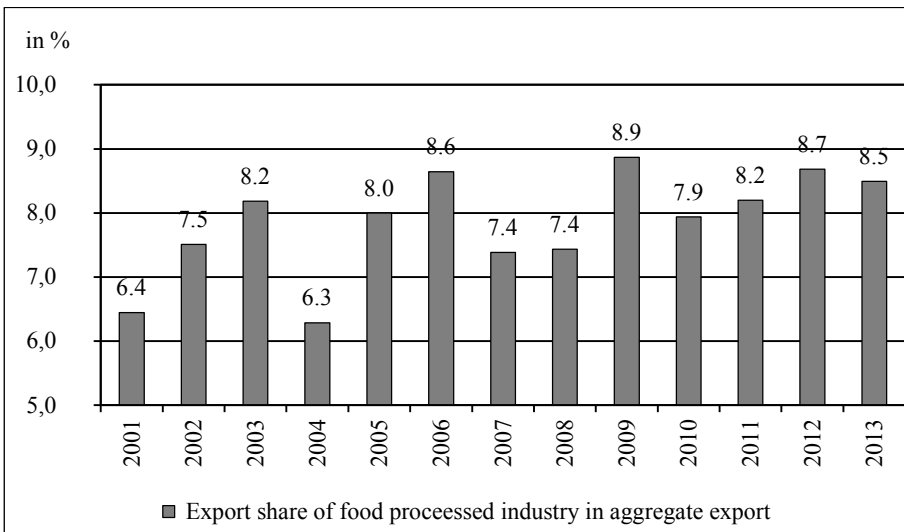Source: authors′ calculations based on data from the UN COMTRADE Database.

Figure 2. Exports' share of the processed food industry in Croatian aggregate exports

Source: authors′ calculations based on data from the UN COMTRADE Database.

Export trends of the Croatian food industry from 2001 to 2013 passed through different phases (Figure 3). Strong export growth occurred in the 2001-2006 period and in 2011. Favourable trends in international markets, coupled with the higher degree of openness and international integration of the Croatian economy, positively affected food industry exports which recorded continuous growth until 2008. The food industry is traditionally viewed as one of the key Croatian economic sectors whose production is based on high quality agricultural inputs and some of the products have been recognised as quality trademarks on the EU market (for example Vegeta, Gavrilović, Kraš etc. are Croatian products which have been well known in international markets for decades). A somewhat higher export decrease in 2009 was expected due to the consequences of the global recession and drop in foreign demand. However, while other industrial sectors suffered severe consequences of the recession, the food industry showed in 2010 recession resistance and the first signs of recovery. Positive trends with higher export growth continued in 2011. However, the latest trends are troublesome, for example in 2013 food exports fell by 10.5 percent on a year-on-year basis, and the export of beverages by 11.1 percent.
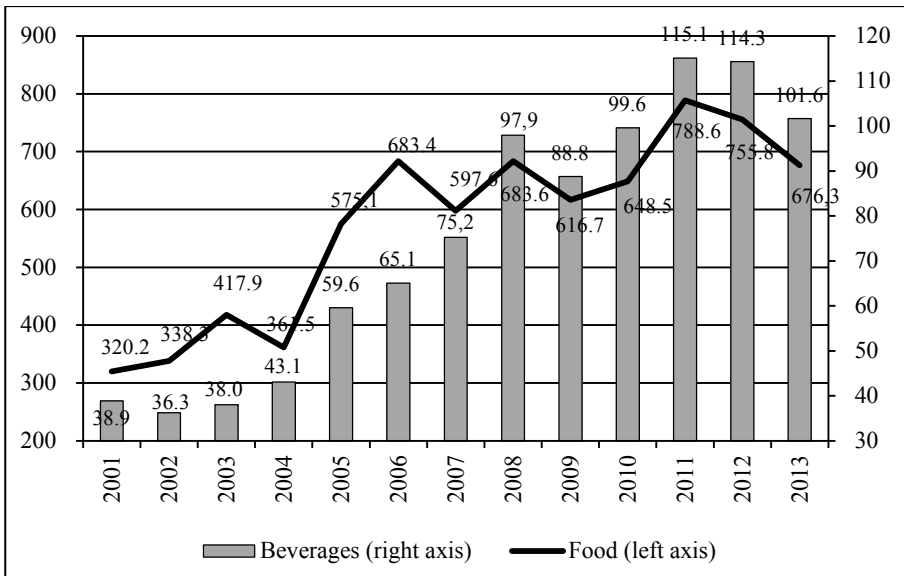

Figure 3. Exports from the Croatian food industry to the world market (in EUR million)

Source: authors' calculations based on data from the UN COMTRADE Database.

During the observed period, the Croatian processed food industry faced a trade deficit (Table 1). However, the size and trend of the trade balance in food products were significantly different from beverages. The growth of openness and the liberalization of the domestic markets had strong impacts on the growth of imported food products. In 2013, the import value of food products doubled compared to the export value. The trade deficit was EUR 713.2 million. At the same time the trade deficit in beverages was much lower – EUR 1.4 million. The share of exports of the Croatian food industry to world exports in the period 2001-2013 remained unchanged (0.14 percent).[4]

Table 1

Basic trends – the Croatian food industry in foreign markets

	Average annual export growth rate[5]		Relative deficit[6]		The share of world export		The share of 3 leading export markets in total export	
	Food	Beverages	Food	Beverages	Food	Beverages	Food	Beverages
2001	-	-	-30.2	-18.8	0.14	0.09	54.9	61.2
2002	5.7	-6.8	-27.2	-26.6	0.17	0.09	56.7	63.4
2003	23.5	4.9	-19.6	-31.6	0.21	0.10	59.6	67.0
2004	-13.5	13.2	-31.0	-23.7	0.17	0.10	55.2	72.7
2005	59.1	38.4	-21.2	-19.8	0.22	0.11	56.5	69.4
2006	18.8	9.1	-15.7	-10.7	0.26	0.12	43.5	73.8
2007	-12.6	15.7	-23.3	-11.8	0.21	0.13	51.8	72.0
2008	14.4	30.1	-28.2	-2.2	0.19	0.15	47.2	68.2
2009	-9.8	-9.3	-26.4	1.8	0.19	0.16	50.0	71.8
2010	5.2	12.1	-25.5	6.4	0.16	0.15	48.2	72.9
2011	21.6	15.6	-26.7	1.0	0.16	0.14	19.3	70.1
2012	-4.2	-0.7	-28.9	8.1	0.15	0.14	44.6	67.2
2013	-10.5	-11.1	-34.5	-0.7	0.14	0.12	43.6	69.9

Source: authors' own calculations based on data from the UN COMTRADE Database.

---

[4] In the same period 2001-2013, Croatia's share in the world markets for the basic food products increased from 0.05 to 0.08 percent.

[5] The average annual export growth rate is calculated using the formula:

$$AAGR_{T,T-n} = \left[\left(\frac{X_T}{X_{T-N}} \right)^{1/n} - 1 \right] \cdot 100$$

where X – the value of export, T – final year, n – number of years.

[6] Relative deficit is defined as $\frac{x-m}{x+m} \cdot 100$, where x is the value of merchandise export, and m – the value of merchandise import.

The characteristic of the trade pattern is a relatively high level of export concentration which is not favourable in the circumstances of the economic crisis. The trends of export and import concentration were determined by the transition process, existing trade relationships, and the proximity of a strong economy – the EU. However, the dynamics in the change of the economic structure, the level of integration and trade specialization can have a significant influence on the (higher or lower) level of export concentration (Buturac, 2013).
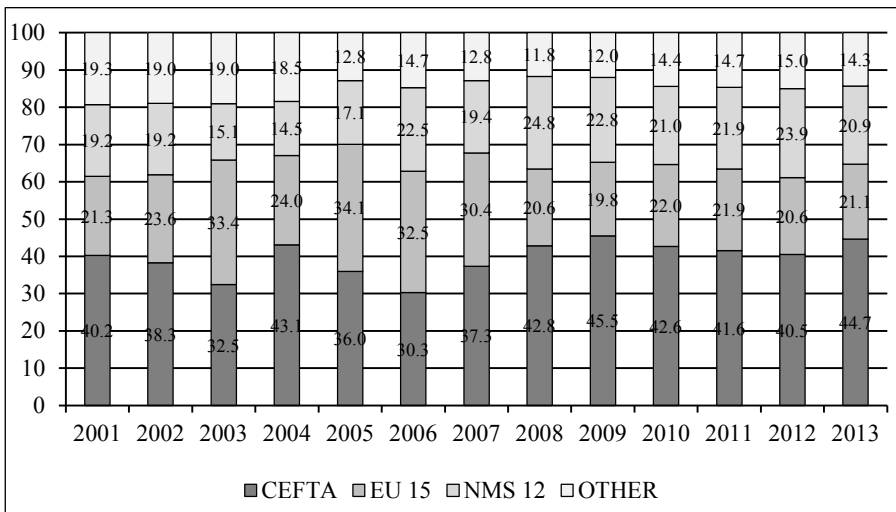

Figure 4. Geographical breakdown of the Croatian food industry exports

Source: authors' own calculations based on data from the UN COMTRADE Database.

A more detailed insight into export concentration enables a geographical breakdown of the exports of the Croatian food industry (Figure 4). A high geographical concentration can be a source of vulnerability due to the sensitivity to cyclical fluctuations to neighbouring markets – the EU and CEFTA.

4. METHODOLOGY: CONSTANT MARKET SHARE ANALYSIS

A CMS analysis is applied to quantify the export performance of the Croatian food industry compared to the rest of the world and individual foreign markets (CEFTA, EU 15, NMS 12). There are a couple of

underlying reasons why the industry's exports failed to grow as rapidly as the world average: a) exports may be concentrated in products for which demand is growing relatively slowly; b) exports may be oriented primarily to relatively stagnant regions; or c) the economic sector in question may have been unable or unwilling to compete effectively with other sources of supply. Here, the constant market share approach (CMS) is applied to explain these effects in the case of the Croatian food industry. The CMS method was first suggested and applied to the study of foreign trade by Tyszynski (1951) and was refined by Baldwin (1958), Leamer and Stern (1970), Richardson (1971), Jempa (1986), Fagerberg and Sollie (1987), Merkies and van der Meer (1988), Milana (1988) and Kapur (1991).

The general idea behind the CMS method is that export performance mainly depends on product composition, geographical distribution, and the level of competitiveness. The usefulness of this analysis stems from the fact that even if a country maintains its share of every commodity in every market, it can still have a decrease in its total market share if exports are oriented towards markets that grow more slowly than the world average and if it exports commodities for which demand is growing more slowly than average (Milana 1988). This section of the paper explores the evolution of market shares of the Croatian food industry in world exports over the 2001-2013 period, taking into account the impact of the product and geographical composition on aggregate exports.

4.1. Description of the model and data sources

For the purpose of the analysis of the export performance of the Croatian food industry, a revised version of the constant market share (CMS) model was used, as proposed by Milana (1988). The components of the basic model are defined as follows:

$$TE \ = \ CE \ + \ PE \ + \ GE + \ RE,$$

where: TE – total effect, CE – competitiveness effect, PE – product effect, GE – geographical effect, RE – residual effect.

Total effect:

$$TE = \left[\frac{\sum_m \sum_p q^{t}{}_{m,p}}{\sum_m \sum_p Q^{t}{}_{m,p}} - \frac{\sum_m \sum_p q^{t-1}{}_{m,p}}{\sum_m \sum_p Q^{t-1}{}_{m,p}} \right] \cdot 100$$

Competitiveness effect:

$$CE = \sum_m \sum_p 0.5 \cdot \left[\frac{q^t_{m,p}}{Q^t_{m,p}} - \frac{q^{t-1}_{m,p}}{Q^{t-1}_{m,p}} \right] \cdot \left[\frac{Q^{t-1}_{m,p}}{\sum_m \sum_p Q^{t-1}_{m,p}} + \frac{Q^t_{m,p}}{\sum_m \sum_p Q^t_{m,p}} \right] \cdot 100$$

Product effect:

$$PE = \sum_m \sum_p 0.5 \cdot \left[\frac{q^{t-1}_{m,p}}{Q^{t-1}_{m,p}} + \frac{q^t_{m,p}}{Q^t_{m,p}} \right] \cdot \left[\frac{\sum_m Q^{t-1}_{m,p}}{\sum_m \sum_p Q^t_{m,p}} - \frac{\sum_m Q^t_{m,p}}{\sum_m \sum_p Q^{t-1}_{m,p}} \right] \cdot 100$$

Geographical effect:

$$GE = \sum_m \sum_p 0.5 \cdot \left[\frac{q^{t-1}_{m,p}}{Q^{t-1}_{m,p}} + \frac{q^t_{m,p}}{Q^t_{m,p}} \right] \cdot \left[\frac{\sum_p Q^t_{m,p}}{\sum_m \sum_p Q^t_{m,p}} - \frac{\sum_p Q^{t-1}_{m,p}}{\sum_m \sum_p Q^{t-1}_{m,p}} \right] \cdot 100$$

Residual effect:

$$RE = TE - (CE + PE + GE),$$

where: q^t – aggregate exports of the focus industry, q^t_p – exports of the pth commodity of the focus industry, Q^t_p – world exports of the pth commodity, $q^t_{m,p}$ – element (m, p) of the reporting country's exports, $Q^t_{m,p}$ – element (m, p) of the world exports at time t, m – market index, p – product index, t – time.

An explanation of the aforementioned effects of the industry's export growth from the basic model is displayed in Table 2.

The constant market share model was used to explore the export performance of the Croatian food industry in the global market, as well as the EU 15 and EU 27 markets during 2001-2013. The analysis of the changes in export share is based on four sub-periods: 2001-2004, 2004-2007, 2007-2010, and 2010-2013. Dividing the years into periods helps the analysis to avoid issues relating to business cycles. The empirical work focused on sixteen major products. The export data used was obtained from the UN Comtrade database. The data used was disaggregated at the two HTS[7] code level.

---

[7] HTS is the abbreviation for Harmonized Tariff System.

Table 2

Explanation of CMS effects

Effect	Description of meaning
Total Effect (TE)	The Total Effect measures the yearly change of the focus industry's aggregate export share in world trade. A positive value suggests that the exports of the focus industry expand faster compared to the rest of the world, and a negative value indicates the opposite.
Competitiveness Effect (CE)	The competitiveness effect reveals the capacity for industry to increase its market share due to competitiveness factors only, independently of structural developments in the market or in the product trade pattern. A positive value indicates a competitive advantage of exports of the focus industry compared to the rest of the world, while a negative value indicates a disadvantage.
Product Effect (PE)	Part of export growth is attributed to the commodity composition of an industry's export. The product effect (PE) is positive if export is concentrated in commodities in which world demand is growing rather quickly.
Geographical Effect (GE)	The geographical effect measures the effect stemming from the geographical breakdown of an industry's exports. This effect is positive if the industry's export is concentrated on markets which have been experiencing relatively rapid growth. A negative value shows that the exports of the focus industry are directed to markets in which demand is growing slower than in the rest of the world.
Residual Effect (RE)	Residual Effect (RE) captures the difference between the actual export growth and the growth that would have occurred if the export shares remained constant.

Source: authors' own elaboration.

Despite the development of a good analytical framework, the CMS method is nevertheless constrained, which must be considered in the application and interpretation of the results (Ahmadi-Esfahani, 2006). Most relevant is that the CMS analysis is always applied to a discrete time period during the time interval assumed although the export structure of the country considered, and the rest of the world are continuously changing. There has been no uniform way to solve the continuous time problem and treatment of the interaction term in the CMS analysis. The methodology of Milana (1988) proposes a satisfactory solution by applying the decomposition to discrete observations at the beginning and the end of the period. In this part of the article the Milana (1988) model has been extended using dynamic development, with the decomposition method applied to each observation of the time horizon. Therefore, the results of the CMS analysis are time series. Secondly, the interpretation of the residual effect is not as straightforward as the other terms: the competitiveness effect (CE), the product effect (PE) and

the geographical effect (GE). A negative residual reflects a failure to maintain market share. Then, according to the basic assumption[8] of the CMS analysis, this residual is necessarily associated with a rise in relative prices. However, this basic assumption ignores many other influences that will affect the stability of a country's exports in foreign markets, such as: differential rates of quality improvement, differential rates of the development of new exports; differential rates of improvement in the efficiency of marketing or in the terms of financing the sale of export goods.

Despite the constraints mentioned above, the dynamic consideration of the CMS analysis helps track all changes in the trade structure and competitiveness over time. Presumably a country will prefer to be concentrated in products and markets that are rapidly expanding and the results of the CMS analysis may indicate a preferred distribution of exports.

5. RESULTS

The CMS effects – the total effect (TE), the competitiveness effect (CE), the product composition effect (PE) and the geographical distribution effect (GE) are calculated separately for the global world market as well as the EU 15, NMS 12 and CEFTA markets (Table 3). The values of these effects above zero indicate a gain in the market share of the Croatian food industry in comparison with the same sector of the reference markets, and the values below zero indicate a loss.

Observing the total effect (TE) on the global market, negative signs are noted in 2004 and in the period 2007-2013. The loss in market share during the above-mentioned period is primarily attributable to the negative competitiveness effect (CE), revealing the inability of the Croatian food industry to increase its market share due to competitiveness factors only, independently of structural developments in the market or in product trade

---

[8] The basic assumption of the CMS approach is that a country's export share in world markets should remain unchanged over time. The theoretical foundations of this assumption are drawn from the idea that demand for exports in a given market from competing sources is a function of relative prices. This suggests that export shares will remain constant, except as relative prices vary. This establishes the validity of the constant share norm and suggests that the difference between export growth implied by the constant-share norm and actual export growth may be attributed to price changes. The discrepancy between the constant-share norm and actual performance has been labelled the competitiveness effect. Thus, when a country fails to maintain its share in world markets, the competitiveness term will be negative and will indicate price increases for the country in question somewhat greater than its competitors.

patterns. Unfortunately, the economic recovery of the EU 15 and NMS 12 markets in the period 2010-2013 did not have a positive impact on the exports of the Croatian food industry. The latest trends in 2013 are especially troublesome due to the significant fall in export competitiveness in the EU 15 (CE= -0.1682) and NMS 12 (CE= -0.1298) markets (Table 3). The European market for food products has been traditionally highly regulated as regards quality standards and the protection of European producers. However, liberalisation and international competition are more pronounced in that market and Croatian producers should increase their competitiveness to increase their presence in that market segment.

Export orientation of the Croatian food industry, measured as the export share in the gross value added, showed a relative satisfactory performance in the prerecession period. The Croatian food industry also presented a certain resistance to the recession which started in 2008. However, the trends in the period between 2009 until the EU accession (2013), confirmed a deterioration of export performance which was primarily the consequence of decreasing export competitiveness.

At the same time, the product effect was mostly positive or close to zero in the observed period in the analysed markets (CEFTA, EU 15, NMS 12) (Table 3). This indicates that the exports of the Croatian food industry concentrated on commodities in which world demand is growing relatively slowly. It is also partly a consequence of the inelastic demand for food products which are a favourable characteristic in the circumstances of an economic crisis or slow economic growth. The negative signs in 2007 and 2008 have been somehow expected concerning the reduction of demand in the segmented markets because of the global economic crisis.

The geographical effect (GE) was mostly negative in the period 2011-2013. In the world market, the geographical effect (GE) of Croatian food industry exports was -0.0264 in 2011, -0.0059 in 2012 and -0.0150 in 2013. This reveals the unfavourable geographical export structure of the Croatian food industry due to the high concentration of export to markets in which demand has been growing slower than in the rest of the world (Bosnia and Herzegovina, Slovenia, Italy)[9]. The insufficient diversification of the market and the product structures revealed the unutilized potentials which could be overcome by new investments, primarily in market research and innovation activities.

---

[9] In 2013 Bosnia and Herzegovina, Italy and Slovenia accounted for 44.0 percent of the total exports of the Croatian food industry.

Table 3

Exports of the Croatian food industry – distribution of CMS effects

	TE	CE	PE	GE	RE
1	2	3	4	5	6
WORLD					
2002	0.1633	0.1565	-0.0301	0.0724	-0.0355
2003	0.2896	0.2918	-0.0859	-0.0321	0.1158
2004	-0.1849	-0.1702	-0.0827	0.2530	-0.1851
2005	0.2677	0.2457	-0.0369	0.1635	-0.1045
2006	0.1993	0.1622	-0.0377	-0.0369	0.1118
2007	-0.1887	-0.1314	-0.1244	0.0355	0.0315
2008	-0.0772	-0.0376	-0.1196	-0.0345	0.1146
2009	0.0150	-0.0382	0.0778	0.0402	-0.0649
2010	-0.1588	-0.1617	-0.0672	-0.0702	0.1403
2011	-0.0408	-0.0045	-0.1270	-0.0264	0.1171
2012	-0.0278	-0.0294	-0.0023	-0.0059	0.0098
2013	-0.1104	-0.1317	-0.0092	-0.0150	0.0154
CEFTA					
2002	-0.1143	-0.1280	0.0055	-0.2108	0.2190
2003	0.1707	-04762	0.0078	0.3547	0.2843
2004	-0.6562	-0.6768	-0.0039	0.0567	-0.0323
2005	-0.2420	-0.3376	0.0297	0.1284	-0.0626
2006	0.1357	0.1410	0.0413	0.1095	-0.1561
2007	-0.0326	-0.0233	-0.0441	-0.0624	0.0973
2008	0.2185	0.2071	-0.0172	0.0896	-0.0610
2009	-0.0227	-0.0420	0.0424	0.0242	-0.0474
2010	-0.1007	-0.0909	0.0044	0.0072	-0.0214
2011	-0.0478	-0.0332	-0.0111	0.0063	-0.0097
2012	-0.0354	-0.0318	0.0040	-0.0186	0.0110
2013	-0.0082	-0.0049	0.0158	-0.0022	-0.0169
EU 15					
2002	0.2643	0.2202	0.0306	-0.0194	0.0329
2003	0.8202	0.8243	0.0118	0.0203	-0.0362
2004	-0.4563	-0.5228	0.0400	0.0104	0.0161
2005	0.8740	0.8785	0.0012	0.0027	-0.0085
2006	0.1453	0.1744	-0.0088	-0.0061	-0.0141
2007	-0.2543	-0.2770	0.0232	-0.0077	0.0072
2008	-0.3980	-0.3662	-0.0045	-0.0168	-0.0105
2009	-0.0334	-0.0729	0.0109	0.0103	0.0182
2010	0.0322	0.0361	0.0011	0.0063	-0.0113
2011	-0.0150	-0.0644	0.0481	-0.0146	0.0159
2012	-0.0245	-0.0156	-0.0120	-0.0143	0.0174
2013	-0.1326	-0.1682	0.0271	-0.0053	0.0137

Table 3, cont.

1	2	3	4	5	6
NMS 12					
2002	0.0763	0.0511	0.0685	-0.0025	-0.0408
2003	-0.0661	-0.0681	0.1062	-0.0134	-0.0907
2004	-0.3391	-0.3491	0.1585	-0.0442	-0.1042
2005	0.3135	0.3170	0.1061	-0.0377	-0.0719
2006	0.5221	0.4731	0.1084	-0.0041	-0.0553
2007	-0.4687	-0.3806	0.1104	-0.0006	-0.1979
2008	0.0827	-0.346	0.2072	-0.0717	-0.0183
2009	-0.0480	-0.1121	-0.0182	0.0155	0.0667
2010	-0.1453	-0.1298	0.0110	-0.0579	0.0315
2011	-0.0017	-0.0899	0.1459	-0.0107	-0.0469
2012	0.0765	0.0842	-0.0111	-0.0386	0.0421
2013	-0.2646	-0.1359	-0.0300	-0.0214	-0.0772

Source: authors' own calculations based on data from the UN COMTRADE Database.

In spite of the common characteristics of the food industry as a whole, there are significant differences in the changes of export performance amongst product groups. This confirms the analysis of relative changes in export share of Croatian food products as a share of total world exports (Table 4). In the period from 2001 to 2013 the growth of export shares in the total world exports of individual commodities highlighted the following products: meat, fish, milling products, animal vegetable oils and fats, sugars, vegetable, fruit, nuts and beverages. These products do represent a significant part of the total export structure of the Croatian agri-food sector. The distribution of the competitiveness effect (CE) and the product effect (PE) according to products reveal the negative competitiveness effect as the main reason for the loss in market shares (Table 5).

The results obtained indicate that major products failed to compete in CEFTA, the EU, and the world market which had a major impact on the export performance of the Croatian food industry. At the same time, the results of the CMS analysis showed that the differentiated growth of world import demand across products and destination markets had allowed the Croatian food industry, specialized in fast-growing products and export markets, to compensate partly their broad loss of export competitiveness.

Table 4

Relative changes of the export share of the Croatian food industry in total world exports

HTS Code	Product	$\frac{(2004-2001)}{2001} \cdot 100$	$\frac{(2007-2004)}{2004} \cdot 100$	$\frac{(2010-2007)}{2007} \cdot 100$	$\frac{(2013-2010)}{2010} \cdot 100$	$\frac{(2013-2001)}{2001} \cdot 100$
02	Meat and edible meat offal	4.12	-0.32	-0.35	0.49	2.36
03[*]	Fish, crustaceans, molluscs	0.57	0.19	-0.23	-0.23	0.11
04	Dairy products, eggs, honey	0.19	0.24	-0.17	-0.41	-0.27
09	Coffee, tea, mate and spices	0.06	-0.36	0.15	-0.08	-0.28
11	Milling products, malt, starches	0.63	0.28	-0.30	0.08	0.60
13	Lac, gum, resins, vegetable saps	0.49	2.35	-0.59	-0.13	-0.40
14[*]	Vegetable weaving materials	0.78	-0.26	-0.05	0.47	-0.78
15	Animal, vegetable fats and oils	0.10	-0.03	0.17	0.01	0.02
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	0.38	-0.21	0.15	-0.09	0.14
17	Sugars and sugar confectionery	0.56	1.33	-0.49	0.11	1.04
18	Cocoa and cocoa preparations	0.25	0.09	-0.17	-0.17	-0.07
19	Preparations of cereals, flour, starch or milk; pastry products	0.02	0.21	0.13	-0.11	0.25
20	Preparations of vegetables, fruit, nuts or other parts of plants	0.03	0.25	0.06	-0.20	0.08
21	Miscellaneous edible preparations	0.11	-0.10	-0.13	-0.01	-0.14
22	Beverages, spirits and vinegar	0.18	0.35	0.12	-0.01	0.23
23	Residues, wastes from the food industry	0.69	0.08	-015	-0.25	0.16

[*]Note: In the interpretation of the results, the limitation of product groups HTS 03 and HTS 14 was taken into account because they contain a certain proportion of agricultural products.

Source: authors' own calculations based on data from the UN COMTRADE Database.

Table 5

Distribution of the competitiveness effect and product effect according to products of the food industry in the period 2009-2013

HTS Code	Product	WORLD		CEFTA		EU 15		NMS 12	
		CE	PE	CE	PE	CE	PE	CE	PE
02	Meat and edible meat offal	0.0056	0.0105	-0.0039	-0.1282	0.0016	-0.0378	-0.0142	-0.0019
03*	Fish, crustaceans, molluscs	-0.0433	0.0592	-0.0099	0.0479	0.1024	0.0559	-0.0028	0.0214
04	Dairy products, eggs, honey	-0.0293	0.0598	-0.3575	-0.0379	-0.0608	-0.0308	-0.0976	0.0450
09	Coffee, tea, mate and spices	-0.0032	0.0080	-0.0460	-0.0445	-0.0049	-0.0201	-0.0028	0.0041
11	Milling products, malt, starches	-0.0047	0.0284	0.0280	-0.0084	0.0017	-0.0058	-0.0237	0.0045
13	Lac, gum, resins, vegetable saps	-0.0004	0.0002	-0.0007	-0.0103	-0.0008	-0.0024	-0.0015	-0.0002
14*	Vegetable plaiting materials	-0.0002	0.0014	-0.0014	-0.0007	0.0001	-0.0005	-0.0001	-0.0001
15	Animal, vegetable fats and oils	-0.0259	0.0708	-0.1342	-0.0899	-0.0332	-0.0346	-0.1852	0.0672
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	-0.0023	0.0468	-0.1966	0.0380	-0.0193	0.0179	-0.0834	0.0635
17	Sugars and sugar confectionery	-0.1482	0.0376	-0.0269	0.1395	0.4853	0.2603	0.2413	0.1888
18	Cocoa and cocoa preparations	-0.0207	0.0148	-0.1428	0.0354	0.0576	-0.0065	0.1077	0.1156
19	Preparations of cereals, flour, starch or milk; pastry products	-0.0122	0.0293	-0.1003	0.0239	0.0861	-0.0107	-0.1156	0.1293
20	Preparations of vegetables, fruit, nuts or other parts of plants	-0.0060	0.0405	-0.0387	-0.0439	0.0038	-0.0204	-0.0056	0.0281
21	Miscellaneous edible preparations	-0.0385	0.1327	-0.2641	0.1362	0.0366	0.0402	-0.1779	0.1795
22	Beverages, spirits and vinegar	-0.0255	0.0904	-0.1977	-0.0213	0.0050	-0.0222	-0.0286	0.0947
23	Residues, wastes from the food industry	-0.0109	0.0325	-0.0040	-0.0413	-0.0147	-0.0136	0.0154	0.0231

*Note: In the interpretation of the results, the limitation of product groups HTS 03 and HTS 14 was taken into account because they contain a certain proportion of agricultural products.

Source: authors' own calculations based on data from the UN COMTRADE Database.

CONCLUSIONS

Economic trends during the last twenty years were characterized by a process of increased opportunities and the integration of the Croatian food industry onto international markets. Export orientation, measured by the export share in gross value added, showed significant improvements in the pre-recession period which is consistent with previous research that found the most important comparative advantage for the Croatian food industry (Bojnec and Ferto, 2006; Bojnec and Ferto, 2007). A certain degree of resistance of the food industry to the recession was present even in the period of the global economic crisis which took place in 2008-2009. However, the latest trends from 2010 to 2013 confirm strong competitive pressure and the need to strengthen export competitiveness. Recent trends are quite opposite to the developments in some similar NMS. For example, the Czech exports of agricultural products according to Belova et al. (2012) maintained a positive level of competitiveness.

The latest trends are characterized by: a significant decrease in the export of food products, a high level of export concentration regarding target markets and because of the growth of imports, a sharp increase in trade deficit was recorded. The export performance of the Croatian food industry was analysed using a methodology defined as the constant market share (CMS) approach. The results indicated that export competitiveness had failed because it had weak export performance. A decrease in international competitiveness is particularly evident on the European market, regardless of the geographical orientation to the old (EU 15) or the new EU member states (NMS 12). Besides the failure of the export competitiveness, an unfavourable geographical export structure was also detected. The high concentration of export to the markets where demand was growing slower than in the rest of the world was noticed, which contributed to the results in which negative geographical effects were found. The insufficient diversification of product and market structures revealed unutilized potentials of development and the necessity of investing more in market research and innovative activities.

The importance of the agri-food sector internationalization and competitive agri-food export integration in global markets is the key factor which could promote market efficiency. The necessity of a successful transformation of food producers from national to global agri-food markets is crucial and that conclusion is in line with recent literature (Bojnec and Ferto, 2015).

REFERENCES

Ahmadi-Esfahani, F. Z., *Constant Market Shares Analysis: Uses, Limitations and Prospects*, "Australian Journal of Agricultural and Resource Economics", 50(4), pp. 510-526, 2006.

Baldwin, E. R., *The Commodity Composition of Trade: Selected Industrial Countries, 1900--1954*, "Review of Economics and Statistics", 40(1), pp. 50-68, 1958.

Belova, A., Smutka, L., Rosochatecka, E., Bazina, A., *Competitiveness of Domestic Production of Poultry Meat on the EU Market and on the World Market*, "Agris On-Line Papers in Economics and Informatics"; 4 (4), pp. 11-25, 2012.

Bojnec, Š., Fertö, I., *Comparative Advantages and Competitiveness of Hungarian and Slovenian Agro-Food Trade in the EU Markets*, In Proceedings of the 98th EAAE Seminar Marketing Dynamics within the Global Trading System: New Perspectives, Chania, Greece, 29 June – 2 July 2006.

Bojnec, Š., Fertö, I., *Comparative Advantages in Agri-Food Trade of Hungary, Croatia and Slovenia with the European Union*; Discussion paper No. 106; Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO): Halle, Germany, 2007.

Bojnec Š., Fertö, I., *Agri-food Export Competitiveness in European Union Countries*, "Journal of Common Market Studies", 53(3), pp. 476-492, 2015.

Buturac, G., *Beyond the Global Recession: Mutual Trade and Economic Convergence*, "Ekonomski pregled", 64(4), pp. 303-326, 2013.

Buturac, G., Lovrinčević, Ž., Mikulić, D., *Export Competitiveness of the Croatian Textile Industry – CMS Analysis and Importance for Economy*, "Tekstilvekonfeksiyon", 24(2), pp. 158-168, 2014.

Buturac, G., Vizek, M., *Export of Croatian Food Industry and Effects on the Economy: the Case of Croatia*, "Ekonomski pregled", 66(3), pp. 203-230, 2014.

Carraresi, L., Banterle, A., *The Agri-food Competitive Performance in the EU Countries: A Fifteen Years Retrospective*, "International Food and Agribusiness Management Review", 18(2), pp. 37-62, 2015.

European Commission**,** *Trade, Growth and World Affairs: Trade Policy as a Core Component of the EU's 2020 Strategy*. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM (2010) 612, DG Trade: Brussels, 2010.

Fagerberg, J., Sollie, G., *The Method of Constant Market Shares Analysis Reconsidered*, "Applied Economics", 19(12), pp. 1571-1583, 1987.

Grossman, G. M., Helpman, E., *Innovation and Growth in the Global Economy*. MIT Press, Cambridge, 1991.

Ignjatijević, S., Ćirić, M., Carić, M., *International Trade Structure of Countries from the Danube Region: Comparative Advantage Analysis of Export*, "Ekonomicky Casopis", 61(3), pp. 251–269, 2013.

Ignjatijević, S., Milojević, I., Cvijanović, G., Jandrić, M., *Balance of Comparative Advantages in the Processed Food Sector of the Danube Countries*, "Sustainability", 7(8), pp. 6976--6993, 2015.

Ishchukova, N., Smutka, L., *Revealed Comparative Advantage of Russian Agricultural Exports*. "Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis", 61(4), pp. 941--952, 2013.

Jambor, A., Hubbard, L. J., *Changes in Hungarian Agri-Food Trade Since EU accession*, Conference Foz do Iguacu, Brazil, International Association of Agricultural Economists, 2012.

Jempa, C. J., *Extensions and Application Possibilities of the Constant-Market-Shares Analysis*. Rijkusuniversiteit, Groningen, 1986.

Kapur, S. N., *The Structure and Competitiveness of India's Exports*, "Indian Economic Review", 26(2), pp. 221-237, 1991.

Krueger, A. O., *Trade Policy as an Input to Development*, "American Economic Review", 70(2), pp. 288-292, 1980.

Leamer, E. E., Stern, R., *Quantitative International Economics*. Allen & Bacon, Boston, 1970.

Lovrinčević, Ž., Buturac, G., Mikulić, D., *Export Performance of the Croatian Wood Industry and Its Contribution to the Overall Croatian Economy*, "Forest Products Journal", 65(3-4), pp. 159-165, 2015.

Majkovič, D., Turk, J., Chevassus-Lozza, E., *Agri-food Trade Analysis: Comparison of Slovenia with the Nine new Member States*, "Journal of Central European Agriculture", 7(3), pp. 401–408, 2006.

Merkies, H. Q. M. A., van der Meer, T., *A Theoretical Foundation for CMS Analysis*, "Empirical Economics", 13(2), pp. 65-80, 1988.

Milana, C., *Constant-Market-Shares Analysis and Index Number Theory*, "European Journal of Political Economy", 4(4), pp. 453-478, 1988.

Procházka, P., Smutka, L., *Czech Republic as an Important Producer of Poppy Seed*, "Agris On-Line Papers in Economics and Informatics", 4(2), pp. 35-47, 2012.

Raičević, V., Ignjatijević, S., Matijašević, J., *Economic and Legal Determinants of Export Competitiveness of the Food Industry of Serbia*, "Industry", 40(1), pp. 201–226, 2012.

Richardson, J. D., *Constant-market-shares Analysis of Export Growth*, "Journal of International Economics", 1(2), pp. 227-239, 1971.

Rusali, A. M., *Evaluation of the Romanian Agricultural Products Specialization in the Intra-Sectoral Foreign Trade*, "Agricultural Economics – Czech", 10(1), pp. 77–83, 2013.

Svatoš, M., Smutka,L., *Comparative Advantages of the Czech Agrarian Foreign Trade in Relation to the EU and Third Countries*, "Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis", 60(4), pp. 363-378, 2012.

Török, A., Jambor, A., *Agri-food Trade of the New Member States since the EU Accession*, "Agricultural Economics – Czech", 59(3), pp. 101–112, 2013.

Tyszynski, H., *World Trade in Manufactured Commodities*, "The Manchester School of Economic and Social Studies", 19(3), pp. 272-304, 1951.