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*International Food and Agribusiness Management Review*  
Volume 18 Issue 2, 2015

## **Agri-food Competitive Performance in EU Countries: A Fifteen-Year Retrospective**

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### **Abstract**

Competitiveness is a crucial issue in the EU agri-food market. In the last fifteen years, two significant events have affected the competitive performance of agriculture and the food industry in different EU countries, namely the EU accession of Central and Eastern European countries (CEECs) and the global economic crisis of 2008. This paper evaluates the EU countries' competitive performance at a sector level in the intra-EU market from 1995 to 2011 by comparing the food industry and agriculture; and assessing the effects of the EU expansion and economic crisis on country competitiveness. EMS and RCA indices were used to measure the competitive performance over time. Results showed that although agriculture and the food industry in the EU are interconnected, they often reveal divergent trends in competitive performance. Germany and the Netherlands have profited the most from the opportunities resulting from the enlargement. On the contrary, France has lost competitiveness. A similar trend was found in Belgium. Italy shows a substantial competitive stasis, similar to Spain.

**Keywords:** competitive performance, agriculture, food industry, EU enlargement, global economic crisis.

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## Introduction

Competitiveness is a crucial issue in the European agri-food market, as continuously argued by European Commission (European Commission 2013). In the last fifteen years, two significant events have affected the competitive performance of agriculture and food industry in different EU countries, namely the EU accession of Central and Eastern European countries (CEECs) and the global economic crisis of 2008.

The first event led to changes in the competitive positions of these countries creating new opportunities and risks for old and new member states (Caetano et al. 2004). The enlargement opened free trade possibilities for 12 more countries increasing trade flow and a rise in product demand (Bojnec and Fertő 2014; Török and Jámor 2013; Qineti et al. 2009; Zaghini 2005). These elements intensified the competition among countries while creating new opportunities. Trading between CEECs and other EU countries has been active since the '90s due to the elimination of political trade barriers between Eastern and Western Europe (Piazolo 1996; Caetano et al. 2004; Rojec and Ferjančič 2006; Yom Din, 2013) and has intensified since the enlargement. Moreover, especially in the agricultural sector, the EU expansion combined with the effects of CAP reform, a decrease in protection and tariff reduction has led to changes in the agricultural markets and growing competition (Hermans et al. 2010).

Second, the global economic crisis of 2008, still afflicting the European economy has shaped trends in agriculture and food industry, although the negative effects seen in the entire manufacturing sector have not been as strong in these examined sectors (European Commission 2009). CEECs, in particular, have been impacted by the crisis as financial market confidence has decreased; moreover, these countries are already characterized by high deficits and a need for international finance (Dietrich et al. 2011; Albulescu 2011).

In addition to the EU enlargement and the crisis, the European agriculture and food industry are interested in several other issues affecting their competitive level: globalization, vertical competition between food processors and large retailers, decreases in transportation and logistics costs, sector fragmentation, and changes in consumer preferences for health, safety and environmental sustainability concerns (Harling 2008; Wubben and Isakhanyan 2013). These factors require the competition to find new ways to differentiate products and develop a distinctive identity as trade flows are not only influenced by low prices but also qualitative features (Rademakers 2012; Antimiani et al. 2012; Boehlje et al. 2011; Mayer and Ottaviano 2008; Niemi and Huan-Niemi 2007).

As revealed in the literature, the changes and challenges needed to compete in agriculture and the food industry are numerous, especially for the CEECs. Thus, there is a need to study the situation of EU agri-food competitive environment and how different countries have faced the opportunities and threats occurring over the last twenty years.

Several approaches in the literature are utilized to evaluate competitiveness. The first approach deals with the computation of trade indices over the years in order to assess the competitive performance of sectors and/or countries. In this category some authors have mainly focused on specific industrial sectors and/or on specific countries in the intra-EU area (Mulder et al. 2004;

Drescher and Maurer 1999; Gorton et al. 2000; Bavorova 2003; Bojnec and Fertő 2009; Juhász and Wagner 2013). Others assess competitiveness by using the same indices, but comparing EU countries with extra-EU ones (Wijnands et al. 2008; Ball et al. 2010; Qineti et al. 2009).

A second approach uses Porter's "diamond model" (Porter 1990). In this category some authors have computed performance indicators, such as domestic resource costs, social cost-benefit ratio, costs of production (Banse et al. 1999; Gorton and Davidova 2001; Liefert 2002; Gallagher et al. 2006). Davidova et al. (2003) use profitability indicators, whereas some others compute productivity and efficiency (Brümmer et al. 2002; Fogarasi and Latruffe 2009; Furtan and Sauer 2008; Fischer and Schornberg 2007).

Our analysis follows the first approach and contributes to filling the gap in existing literature by comparing the competitive performance of agriculture and the food industry among all EU countries. The analysis of agriculture and food industry competitiveness is interesting as these sectors are strictly interconnected, and the competitiveness of one sector can affect the other and vice-a-versa. Therefore, a key question concerns whether agriculture and the food industry show similar trends in terms of competitive performance or not. Furthermore, in the literature, an overview about the competitiveness of EU countries comparing agriculture and food industry over an extended period of time is missing, as is the effect of economic crisis on these two sectors. To fill this gap, our analysis takes into consideration all 27 EU countries, and the products of both agriculture and the food industry, without limiting the analysis to a few specific countries and/or sectors.

Thus, the purpose of this paper is to evaluate the competitive performance of EU countries at sector level in the intra-EU market from 1995 to 2011, comparing food industry and agriculture. In particular, the effect of the EU enlargement and the economic crisis on the competitiveness will be assessed. In this way, it is possible to highlight which countries have profited by the EU enlargement and which ones have been most affected by the economic crisis.

Furthermore, is the case of Italy—one of the biggest food producing and exporting countries in the EU. Italy is analyzed in more depth, trying to understand the determinants of competitive performance while highlighting the strengths and weaknesses of Italian agriculture and the food industry. We have chosen Italy because its food sector is third in Europe in terms of sales, after Germany and France (FoodDrinkEurope 2014). Moreover, we have recent data describing trade performance in agriculture and the food industry (INEA 2013). There are also many agri-food products certified as PDO-PGI having a high reputation at international levels, appreciated by foreign consumers, these may affect Italian competitive performance. Here, Italy is used as a kind of case study to reflect on possible determinants of competitive performance, even though it is not the main objective of our paper.

The data came from the Eurostat database of international trade. The competitive performance of the EU countries was measured through Export Market Share and Revealed Comparative Advantage, analyzing values over the last fifteen years.

The remainder of this paper is structured as follows: the next section defines the scope of competitive performance analyzed in this research, followed by the methodology and

presentation of results. Finally, the case of Italy is outlined, leading to a discussion and our concluding remarks.

## **The Evaluation of Competitive Performance**

The concept of competitiveness does not have one clear universal definition. Often it is synonymous with competitive or comparative advantage although this is not entirely correct (Siggel 2006). Indeed, it is necessary to determine whether we are examining it from a micro or macroeconomic perspective, as the indices to measure it are different. In this paper, we focus on the assessment of competitiveness at a sector level intended to help industry reach, conserve, and increase market share over time against other competitors in the international market (Latruffe 2010; Bojnec and Fertő 2009; Traill 1998; Van Rooyen et al. 2011).

The concept of competitiveness is connected to the achievement of competitive advantage, theorized by the Porter's seminal work (1990). Nevertheless, measuring competitive advantage is not easy. Therefore, the assessment of competitiveness is often done indirectly, taking into consideration the competitive position of a firm or sector in the international market and its competitive performance over a specific time period (Adams et al. 2006). For these two measurements, particular trade indices have been formulated, allowing a comparison of different countries (or firms) or time series data (Latruffe 2010). These indices are typically ex-post indices, useful to demonstrate the competitive performance of a country, although they are not able to outline the source of the advantage (Siggel 2006). Other measurement models do exist in the literature, but require many assumptions, whereas the indices discussed here provide a clear framework for the entire competitive situation, are more controllable and do not require too many notions about the country under examination (Siggel 2006).

Moreover, as Lall (2001) asserts, "while competitiveness indices have become significant in the policy discourse in many developing countries, surprisingly little is known about their economic foundations: how soundly they are based in theory and constructed in practice. [...] This may be changing, however, as well-known academics enter into debates on competitiveness and also engage in index preparation. In any case, it is useful to analyze the indices simply because they are now so often used for economic policy making and analysis."

Although these indices do not analyze the determinants of competitiveness, they do provide a quick overview for an ensemble of countries. By calculating the trend of the indices over time, it is also easily possible to estimate the gain or loss of competitiveness. Furthermore, by utilizing a few indices together, we are able to analyze competitive performance from several angles.

Thus, our analysis evaluates the competitive performance of agriculture and the food industry in 27 EU countries. With this aim, we chose two popular trade indices found in the literature: Export Market Share (EMS) and Balassa Revealed Comparative Advantage (RCA) (Banterle and Carraresi 2007; Lall 2001; Bojnec and Fertő 2014; Sarker and Ratnasena 2014). Aspects of export flow and sectorial export specialization are evaluated over time with a cross-country comparison for a sector in the international market.

While EMS assesses the export orientation of a country for a specific sector compared to a set of countries, RCA measures the country export specialization of a specific sector. Values are positive and, if greater than 100, the country is export specialized in the sector analyzed (Balassa

1965; Siggel 2006; Havrila and Gunawardana 2003; Adams et al. 2006; Bojnec and Fertő 2012)<sup>1</sup>.

## Methodology

Data necessary for the analysis came from the Eurostat database of international trade. Export flows in the intra-EU market from 1995 to 2011 were employed for the product categories related to agriculture and the food industry. The intra-EU market was chosen in order to evaluate competitiveness under free trade conditions (Banterle and Carraresi 2007). Thus, data in the categories with 2-digits codes (HS-2) from 01 to 24 (except fisheries, agricultural non-foodstuffs, animal feeding, and tobacco) were extracted and aggregated into two sectors: agriculture and the food industry. The product distribution into agriculture and the food industry is explained in Table 1. EU-15 countries were divided between big and small relative to the value of equal distribution of EMS (6.6%).

**Table 1.** Division of products into agriculture and food industry following Eurostat Combined Nomenclature HS-2

Agriculture		Food Industry	
Eurostat Combined Nomenclature			
01	Live animals	02	Meat and edible meat offal
07	Edible vegetables and certain roots and tubers	04	Dairy products
08	Edible fruits and nuts; peel of citrus fruits or melons	09	Coffee, tea, mate, spices
10	Cereals	11	Products of milling industry, malt, starches
12	Oil seeds and oleaginous fruits	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
		16	Preparations of meats, fish
		17	Sugar and sugar confectionery
		18	Cocoa and cocoa preparations
		19	Preparations of cereals, flour, starch or milk; pastry-cook products
		20	Preparations of vegetables, fruit, nuts or other parts of plants
		21	Miscellaneous edible preparations
		22	Beverages, spirits, and vinegar

<sup>1</sup> Formally the index is expressed as:

$$RCA_{ij} = \frac{X_{ij} / \sum_{j=1}^n X_{ij}}{\sum_{i=1}^m X_{ij} / \sum_{i=1}^m \sum_{j=1}^n X_{ij}} * 100$$

where  $X_{ij}$  indicates exports of sector  $i$  from country  $j$ ,  $n$  indicates the number of countries analyzed and  $m$  the total number of sectors.

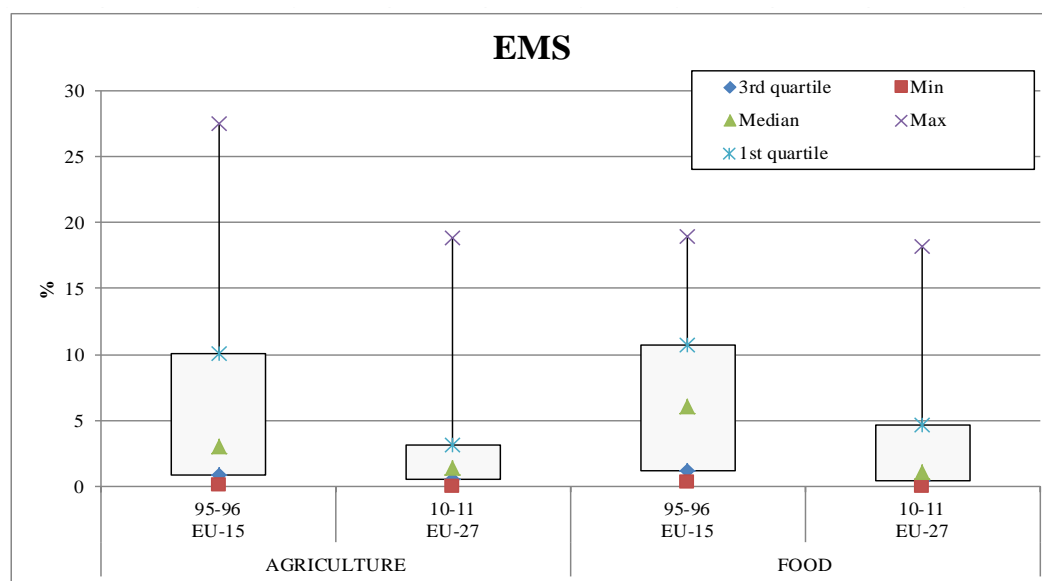
The dynamic analysis of the EMS and RCA are divided into three sub-periods: the first sub-period is from 1995 to 2002 and includes 14 EU countries<sup>2</sup>, the second sub-period, from 2003 to 2008 includes 27 EU countries and highlights the effects of enlargement. The third sub-period, from 2009 to 2011 underlines the dynamics during the economic crisis for 27 EU countries. For a better interpretation of the results, we calculated the average yearly rate of variation of EMS and RCA for both agriculture and the food industry. Finally, we reported in the graphs the dynamics of agriculture and the food industry.

We chose this procedure for two reasons: first, by dividing into three sub-periods it is possible to draw attention to the effects of the main events of the period analyzed, namely the EU enlargement and the economic crisis; second, by calculating the average yearly rate of variation we are able to include the effect of the index trend of each year of the period analyzed in order to not lose any information in the final competitive performance evaluation.

## Results

### *The Competitive Situation of Agriculture and Food Industry in the EU in the Sub-period 1995-2011 Relatively to EMS*

In order to have a portrait of the EMS situation of agriculture and food industry at the beginning (1995-96, EU-15) and at the end of the period analyzed (2010-11, EU-27), we built a box-plot (Figure 1).



**Figure 1.** Box-plot of EMS distribution for agriculture and food industry

**Source.** Author's own calculations based on International Trade Eurostat database

<sup>2</sup> In this part of the Eurostat database, Belgium and Luxembourg are joined together.

The difference in the value distribution between the beginning and end of the period analyzed can be explained by the entrance of 12 new member states in the EU, the economic dimensions of which are quite small (with the exception of Poland).

Concerning agriculture, the maximum EMS is 18.8% (in 2010-11) and the six main exporting countries (Netherlands, Spain, France, Belgium, Italy, Germany) are included in the first quartile of the distribution. This means that 76% of agriculture's EMS is covered by these countries, leading to quite a high level of sectorial trading concentration (Table 2). The concentration level was much higher in 1995-96, considering EU-15, when the first four biggest exporting countries (included in the first quartile) possessed 73.9% of EMS. The maximum EMS was 27.5% belonging to France, which lost EMS over the analyzed period, decreasing to 14.8%. The low value of median (1.4%), compared to the maximum, confirms the high concentration and the low EMS possessed by most EU countries, especially the CEECs. Indeed, below the median, we find six old member states (Denmark, Portugal, Sweden, Ireland, Finland, Luxembourg) and eight new member states (Czech Republic, Slovak, Lithuania, Slovenia, Latvia, Estonia, Cyprus, Malta) (Tables 3 and 4). In the CEEC group, only Hungary, Poland, Romania and Bulgaria have an EMS in agriculture more than 2%, but less than 3.6%.

Within the food industry, the maximum is 18.2% (in 2010-11), possessed by Germany, followed by the Netherlands, France, Belgium-Luxembourg, Italy and Spain, which covered 71.2% of EMS. Thus, there is a high intra-EU trading concentration also in the food industry. A difference with agriculture concerns the distance between the first quartile and the median; the EMS of the countries in the second quartile is higher than the one of agriculture. In particular the countries with EMS between 1.1 and 4.7% are Poland, Denmark, Ireland, Austria, Hungary, Czech Republic and Sweden.

**Table 2.** EMS of big EU countries in agriculture and the food industry

Agriculture				Food Industry			
EMS	1995-1996	2003-2004	2010-2011	EMS	1995-1996	2003-2004	2010-2011
<i>Big countries</i>				<i>Big countries</i>			
Netherlands	17.31	17.42	18.82	Germany	14.66	16.79	18.18
Spain	18.55	21.92	18.24	Netherlands	17.33	14.73	16.17
France	27.50	21.31	14.79	France	18.97	14.93	12.75
Belgium-Lux	10.52	8.71	8.66	Belgium-Lux	11.67	11.23	9.99
Italy	8.63	7.22	7.96	Italy	7.16	7.88	7.80
Germany	7.19	7.96	7.40	Spain	5.42	7.50	6.65
<b>Mean</b>	14.95	14.09	12.65	<b>Mean</b>	12.53	12.18	11.92

**Source.** Authors' own calculations based on International Trade Eurostat database



**Table 3.** EMS of small EU countries in agriculture and the food industry

EMS		Agriculture		EMS		Food Industry	
<i>Small countries</i>	1995-1996	2003-2004	2010-2011	<i>Small countries</i>	1995-1996	2003-2004	2010-2011
United Kingdom	4.19	2.62	2.63	United Kingdom	7.96	6.48	5.37
Austria	0.99	1.60	1.77	Denmark	6.56	5.46	3.71
Greece	1.66	1.19	1.44	Ireland	5.50	3.92	3.09
Denmark	1.87	1.46	1.24	Austria	1.16	2.60	3.05
Portugal	0.28	0.58	0.84	Sweden	0.84	1.15	1.13
Sweden	0.33	0.59	0.63	Portugal	1.03	1.01	0.94
Ireland	0.87	1.02	0.38	Greece	1.42	0.81	0.85
Finland	0.10	0.10	0.25	Finland	0.32	0.37	0.34
<b>Mean</b>	1.29	1.14	1.15	<b>Mean</b>	3.10	2.73	2.31

**Source.** Authors' own calculations based on International Trade Eurostat database

**Table 4.** EMS of CEECs in agriculture and the food industry

EMS		Agriculture		EMS		Food Industry	
<i>CEECs</i>	2003-2004	2010-2011		<i>CEECs</i>	2003-2004	2010-2011	
Hungary	1.85	3.60		Poland	2.03	4.02	
Poland	1.40	2.68		Hungary	0.89	1.55	
Romania	0.62	2.06		Czech Rep.	0.82	1.39	
Bulgaria	0.34	2.06		Slovak	0.35	0.87	
Czech Rep.	0.73	1.43		Lithuania	0.25	0.53	
Slovak	0.41	1.13		Bulgaria	0.19	0.48	
Lithuania	0.24	0.65		Romania	0.11	0.47	
Slovenia	0.02	0.53		Latvia	0.11	0.24	
Latvia	0.07	0.48		Estonia	0.18	0.24	
Estonia	0.03	0.18		Slovenia	0.09	0.17	
Cyprus	0.19	0.13		Cyprus	0.03	0.04	
Malta	0.01	0.00		Malta	0.01	0.01	
<b>Mean</b>	0.49	1.24		<b>Mean</b>	0.42	0.83	

**Source.** Authors' own calculations based on International Trade Eurostat database

The countries with the highest EMS are the same in both agriculture and the food industry. Thus, in our analysis, we decided to separate the largest exporting countries (EMS > 6.6%) from the smallest exporting countries; among these small countries, eight are old member states, whereas the others are the 12 new member states (CEECs).

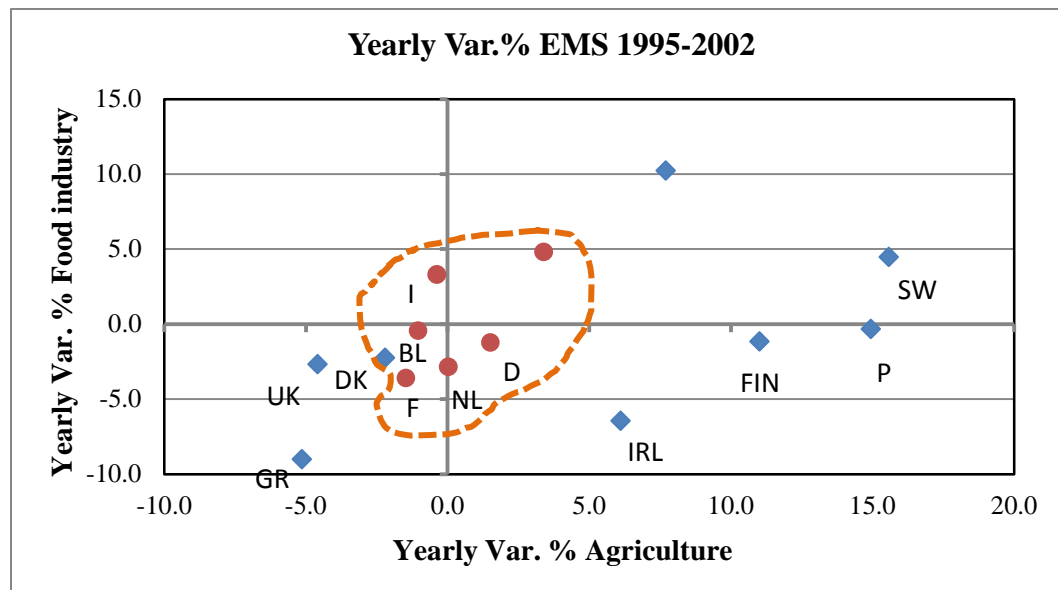
#### *The Competitive Performance of EU-15 Countries in Agriculture and the Food Industry Based on EMS*

Concerning the EMS dynamics, we compared graphs from three different sub-periods in order to highlight the EU countries' competitive performance in agriculture and the food industry.

Among the big countries, in the first sub-period (1995-2002), only Spain increased EMS in both sectors. Italy grew in the food industry, whereas Germany grew in agriculture. France, Belgium-Luxembourg, and the Netherlands experienced poor performance in both sectors (Figure 2). The

situation changed in the second sub-period when Germany and the Netherlands showed significant growth. Italy moderately increased, while Spain and Belgium lost competitiveness in agriculture and the food industry, respectively. France continued a negative trend (Figure 3).

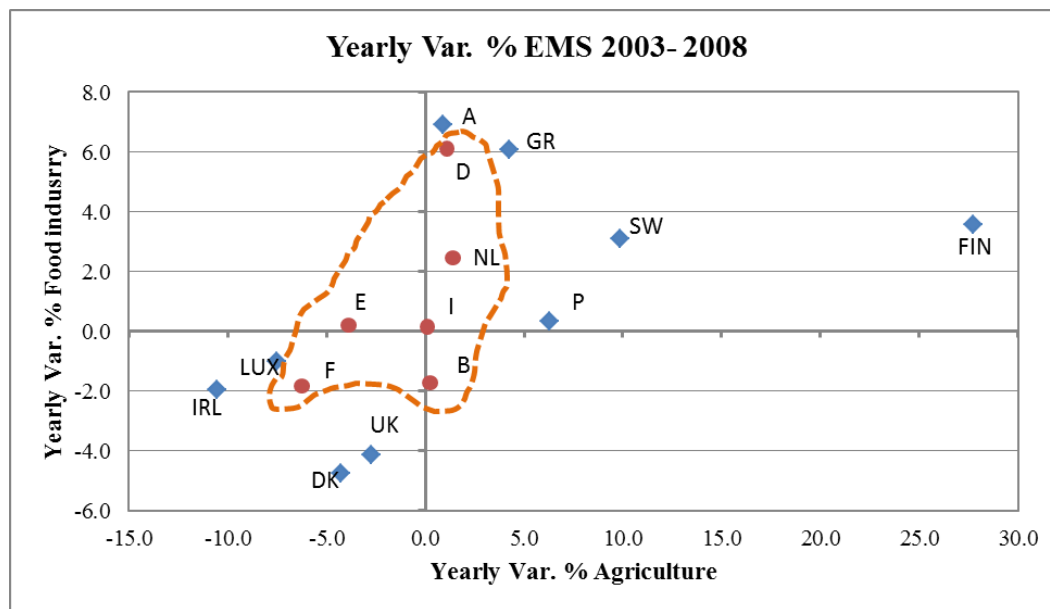
In the third sub-period, the economic crisis moved the “cloud” of countries towards the negative part of the graph (Figure 4). Only Spain was able to regain competitiveness in both sectors. Italy and Belgium slightly improved in the food industry, whereas Germany, the Netherlands, and France lost competitiveness in both sectors.



**Figure 2.** Competitive performance of EU-15 countries in agriculture and the food industry in the period 1995-2002.

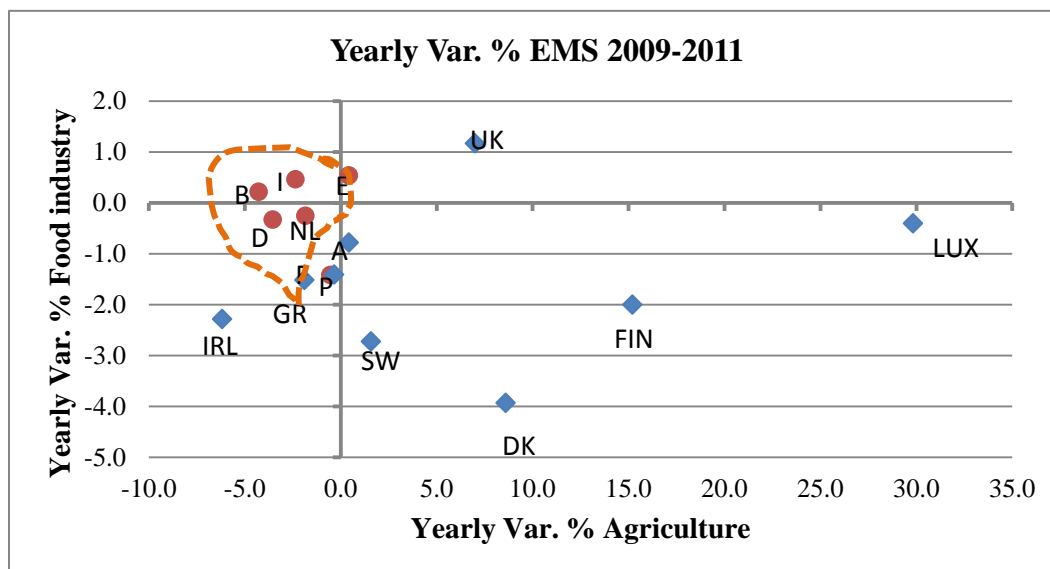
**Source.** Authors' own calculations based on International Trade Eurostat database

In general, when examining the entire period analyzed, we observed that France and Belgium showed poor competitive performance in both sectors (Belgium was an exception from 2009-2011). Spain shows a fluctuating trend, by increasing competitiveness in the first and the third sub-period in both sectors, but lost EMS in agriculture during the second sub-period. Germany profited the most from the EU enlargement especially in the food industry, showing 6% EMS growth in 2003-2008. Nevertheless, Germany suffered slightly from the effects of the economic crisis in the third sub-period in both sectors. Similar trends were found in the Netherlands, underscoring how these two countries follow similar trade dynamics in agri-food. On the contrary, Italy did not benefit much from the enlargement, it lost competitiveness in agriculture in the first and third sub-period, while improving in the food industry.



**Figure 3.** Competitive performance of EU-15 countries in the agriculture and food industry in the period 2003-2008

**Source.** Author's own calculations based on International Trade Eurostat database



**Figure 4.** Competitive performance of EU-15 countries in the agriculture and food industry in the period 2009-2011

**Source.** Author's own calculations based on International Trade Eurostat database

During the first sub-period, the dynamics really differentiated the smaller countries. In particular, Austria and Sweden showed higher EMS growth rates in both agriculture and the food industry, whereas Greece and Denmark decreased in both sectors (Figure 2). Austria and Sweden also seized opportunities from the EU enlargement, as seen in the positive growth rates in the second period, along with Greece that completely changed dynamics. Denmark and the United Kingdom

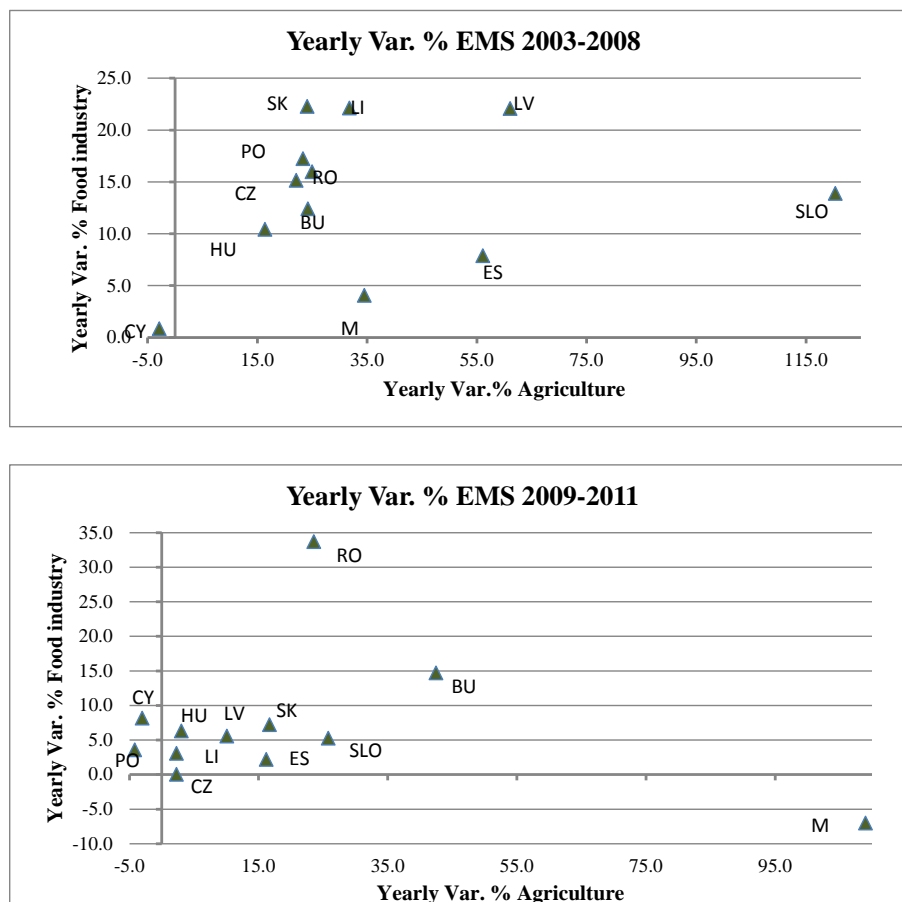
experienced continuous declines in EMS, whereas Portugal revealed notable EMS improvement especially in agriculture (Figure 3).

The economic crisis brought radical change for the United Kingdom resulting in the only country to experience increasing rates in both sectors. Greece plummeted backward on a negative trend, whereas Austria and Sweden reduced dynamics in the food industry (Figure 4).

#### *The Competitive Performance of CEECs Countries in Agriculture and the Food Industry Based on EMS*

The enlargement provided new opportunities for the CEECs, expanding their EMS in both agriculture and the food industry. All the countries showed high growth rates between 2003 and 2008 except for Cyprus (Figure 5). The highest rates in agriculture were observed in Slovenia and Estonia while for the greatest strides in the food industry were made in Slovak, and Lithuania and Latvia improved in both sectors.

In the period of economic crisis, two elements emerged: a reduction in EMS growth rates and negative growth for some countries (Poland, Cyprus, Malta). Moreover, there was steady EMS growth in Romania, Bulgaria, and Slovenia.

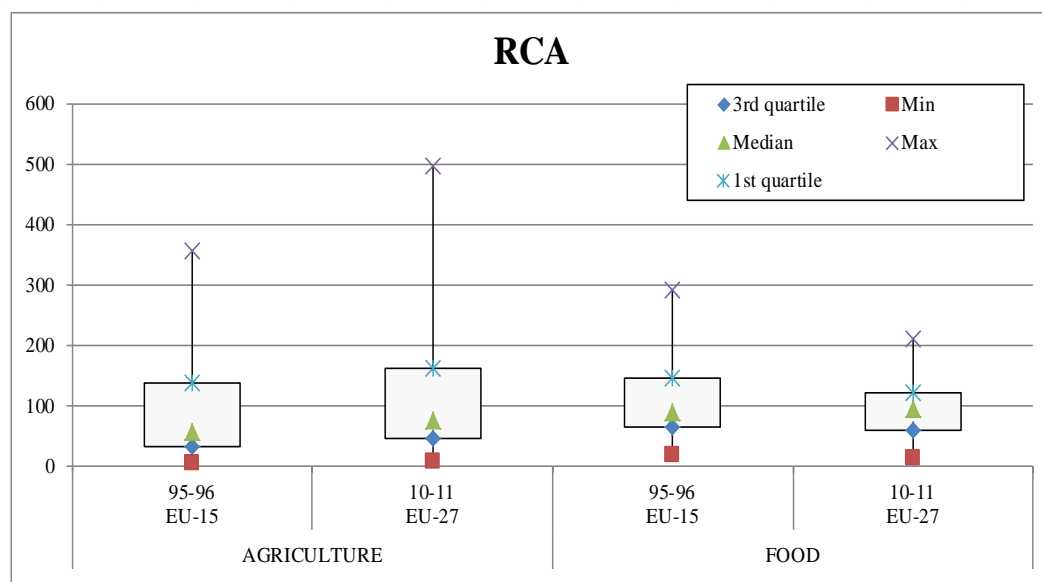


**Figure 5.** The competitive performance of CEECs for agriculture and food industry, 2003-2008 and 2009-2011.

**Source.** Author's own calculations based on International Trade Eurostat database

### *The Export Specialization Situation of EU countries in Agriculture and the Food Industry in the Sub-period 1995-2011*

The RCA in agriculture includes five CEECs, Spain and Greece in the first quartile of 2010-2011(Figure 6, Tables 5 - 7). These countries are very specialized in agricultural trading, although their EMS was moderate, with the exception of Spain. Particularly for the smaller countries, a strong specialization in agricultural exports represents a crucial element in the economy.



**Figure 6.** Box-plot of RCA distribution for agriculture and food industry

**Source.** Author's own calculations based on International Trade Eurostat database

**Table 5.** RCA of big EU countries in agriculture and food industry

Agriculture				Food Industry			
RCA				RCA			
Big countries	1995-1996	2003-2004	2010-2011	Big countries	1995-1996	2003-2004	2010-2011
Spain	355.35	409.85	350.64	France	132.79	126.26	135.80
France	192.64	180.32	157.62	Spain	103.75	140.27	127.74
Netherlands	149.98	157.88	143.04	Netherlands	149.97	133.50	122.87
Italy	84.06	84.33	105.30	Belgium-Lux	117.20	115.82	107.20
Belgium-Lux	105.60	89.79	92.91	Italy	69.73	92.07	103.15
Germany	31.67	35.13	33.02	Germany	64.56	74.10	81.10
<b>Mean</b>	153.22	159.55	147.09	<b>Mean</b>	106.33	113.67	112.98

**Source.** Authors' own calculations based on International Trade Eurostat database

**Table 6.** RCA of small EU countries in agriculture and food industry

<b>RCA</b>				<b>RCA</b>			
<b>Agriculture</b>				<b>Food Industry</b>			
<i>Small countries</i>	1995-1996	2003-2004	2010-2011	<i>Small countries</i>	1995-1996	2003-2004	2010-2011
Greece	341.33	303.30	356.95	Greece	291.82	207.16	211.04
Portugal	19.66	50.02	76.58	Denmark	256.41	255.59	194.83
Denmark	73.08	68.24	65.02	Ireland	217.25	150.09	158.85
Austria	34.95	47.38	55.21	Austria	41.14	77.08	94.77
United Kingdom	38.90	32.26	40.39	Portugal	72.43	88.27	85.11
Sweden	9.28	20.94	23.26	United Kingdom	73.90	79.57	82.48
Finland	5.94	7.34	22.59	Sweden	23.29	41.23	41.91
Ireland	34.19	38.98	19.34	Finland	18.85	26.14	30.41
<b>Mean</b>	69.67	71.06	82.42	<b>Mean</b>	124.38	115.64	112.43

**Source.** Authors' own calculations based on International Trade Eurostat database

**Table 7.** RCA of CEECs in agriculture and food industry

<b>RCA</b>			<b>RCA</b>		
<b>Agriculture</b>			<b>Food Industry</b>		
<i>CEECs</i>	2003-2004	2010-2011	<i>CEECs</i>	2003-2004	2010-2011
Bulgaria	148.14	496.86	Lithuania	110.93	129.89
Cyprus	1106.88	443.60	Cyprus	181.57	119.30
Latvia	59.20	234.72	Latvia	93.76	117.48
Romania	96.19	187.35	Bulgaria	82.12	117.25
Hungary	106.83	164.75	Poland	92.54	107.50
Lithuania	105.89	159.67	Estonia	99.48	91.95
Slovenia	5.08	85.32	Hungary	51.26	70.95
Poland	63.26	71.65	Slovak	39.16	52.09
Estonia	18.98	68.71	Romania	17.34	42.22
Slovak	44.77	67.66	Czech Rep.	38.09	41.07
Czech Rep.	33.74	42.10	Slovenia	21.37	27.43
Malta	12.83	7.62	Malta	11.08	12.43
<b>Mean</b>	150.15	169.17	<b>Mean</b>	69.89	77.46

**Source.** Author's own calculations based on International Trade Eurostat database

The first quartile in the food industry, includes three small countries (Greece, Denmark, Ireland), three big countries (France, Spain, and the Netherlands), and only one CEEC (Lithuania). In the CEECs, a specialization in agriculture prevails, whereas the food industry contributes a limited economic contribution. Among these countries, only Poland has a rather high turnover in the food industry—almost 50 billion € (FoodDrinkEurope 2014). For the three big countries (France, Spain, and the Netherlands), even when over 100, the RCA does not reach considerable values, whereas in Greece, Denmark and Ireland a strong specialization is revealed.

It is worth to notice that RCA tends to assume very high values in countries with small economic dimension because it is computed with respect to total trade; indeed, these small countries are more specialized in specific sectors and, thus, they have a diversification lower than big countries.

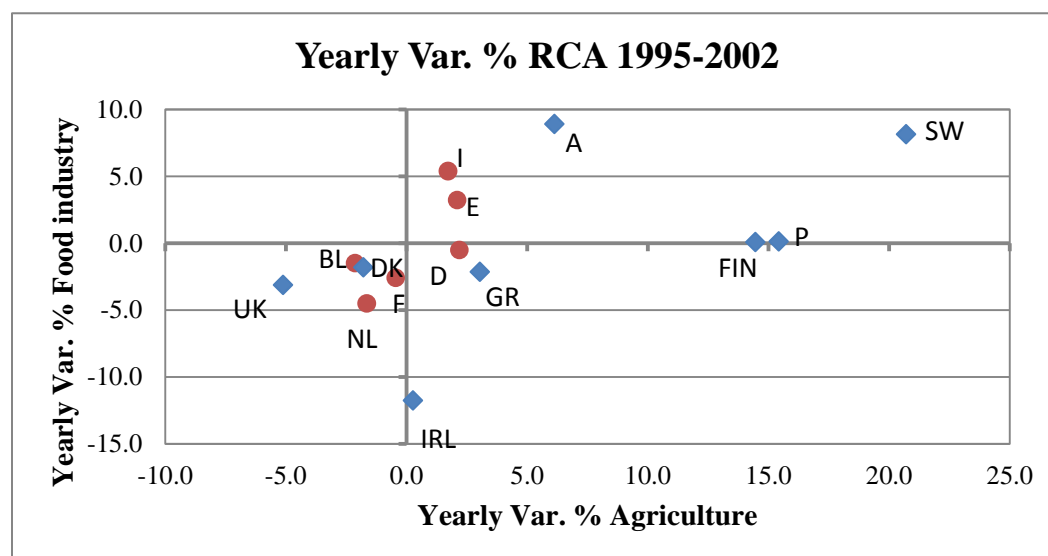
The RCA values are higher in agriculture than in the food industry; the maximum is 497 for the former, and 211 for the latter. Moreover, in agriculture, the first quartile starts at 162 and the countries included in this part of the distribution have different levels of specialization. Diversely, in the food industry, the first quartile starts at 122, and the countries included in this group have RCA values close to each other. The median is quite similar for both agriculture and the food industry, being 80 and 98 respectively.

#### *The Export Specialization Performance of EU-15 Countries in Agriculture and Food Industry*

Starting with the big countries in the sub-period of 1995-2002, only two countries (Italy and Spain) increased their export specialization in both agriculture and in the food industry (Figure 7). Germany, however, improved its export specialization only in agriculture.

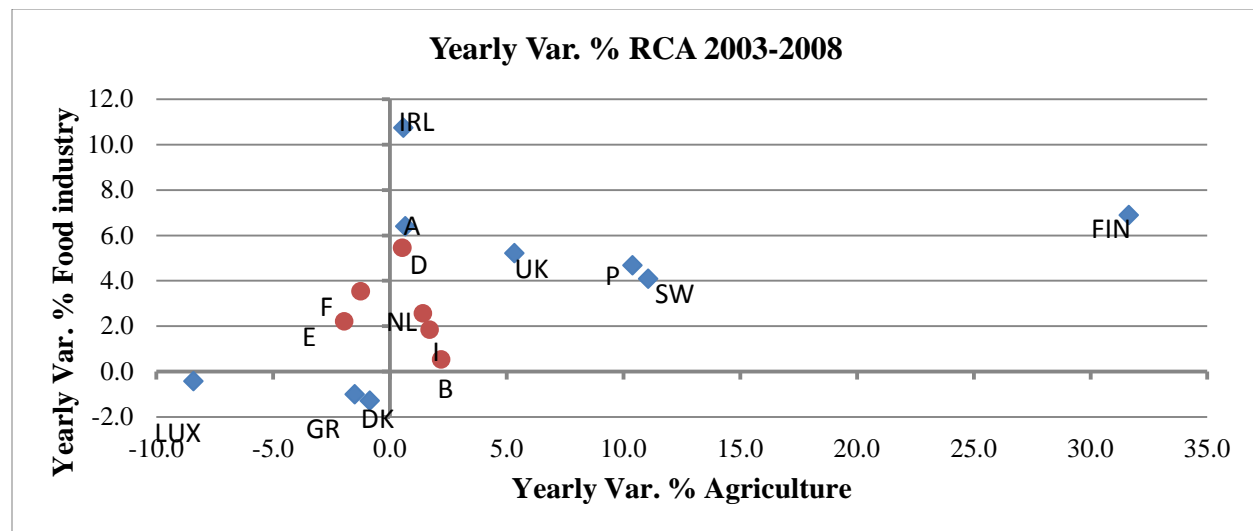
In the sub-period from 2003-2008, the big countries increased their RCA in the food industry, and four of them were also in agriculture (Figure 8). Nevertheless, such specialization does not necessitate an increase of EMS in all countries, as seen before. In particular, Germany and the Netherlands, similarly to the EMS growth, show improvement in export specialization both agriculture and in the food industry.

In the sub-period 2009-2011, the economic crisis leads to an opposite tendency compared to the previous period, with a decrease of specialization, in most countries, especially regarding agricultural exports (Figure 9).



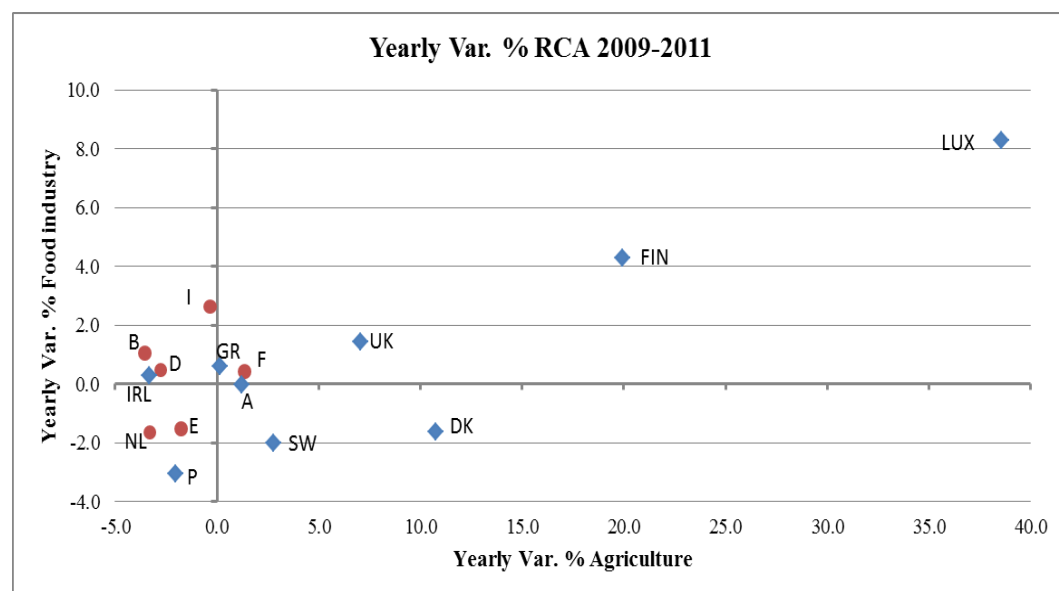
**Figure 7.** Export specialization of EU-15 countries in agriculture and food industry in the period 1995-2002

**Source.** Author's own calculations based on International Trade Eurostat database



**Figure 8.** Export specialization of EU-15 countries for agriculture and food industry in the period 2003-2008

**Source.** Author's own calculations based on International Trade Eurostat database



**Figure 9.** Export specialization of EU-15 countries for agriculture and food industry in the period 2009-2011.

**Source.** Author's own calculations based on International Trade Eurostat database

In general, the dynamics of RCA in the three sub-periods analyzed appear quite diversified among countries, leading to difficulties in identifying clear trends. Germany and the Netherlands are able to profit by EU enlargement, improving their export specialization in both sectors, and in particular in the food industry. Nevertheless, in the period of economic crisis their specialization decreases (like in the first sub-period). Spain confirms its fluctuating trend, together with France and Belgium. Italy improves its RCA especially in the food industry.



Concerning small countries, in the first sub-period there are differentiated trends. The RCA growth of Austria and Sweden in both sectors is noteworthy, and the same is true for Portugal and Finland in agriculture (Figure 7).

In the second sub-period, six countries, out of nine, increased their export specialization in both sectors; in particular, Sweden, Austria, Finland, and Portugal continued a positive trend (Figure 8).

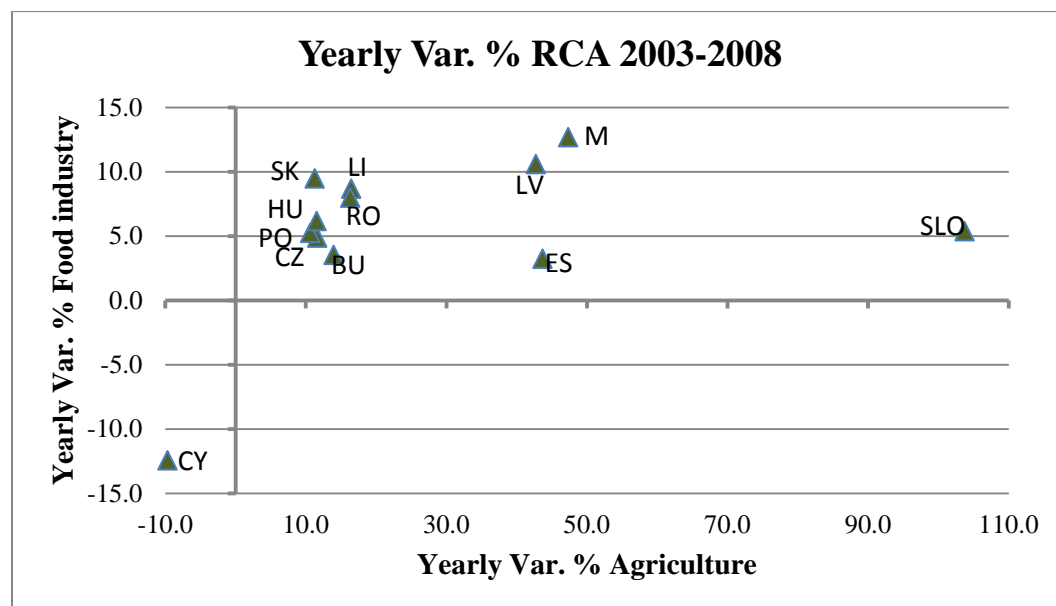
In the last sub-period, characterized by economic crisis, there is another differentiated frame: five countries have a positive evolution of RCA in both sectors (Luxembourg, Finland, United Kingdom, Austria, Greece), and two improve their specialization in agriculture (Denmark and Sweden) (Figure 9). In the group of countries with the highest growth, in the last period, only Finland still has a significant growth, whereas Portugal decreases its specialization in both sectors.

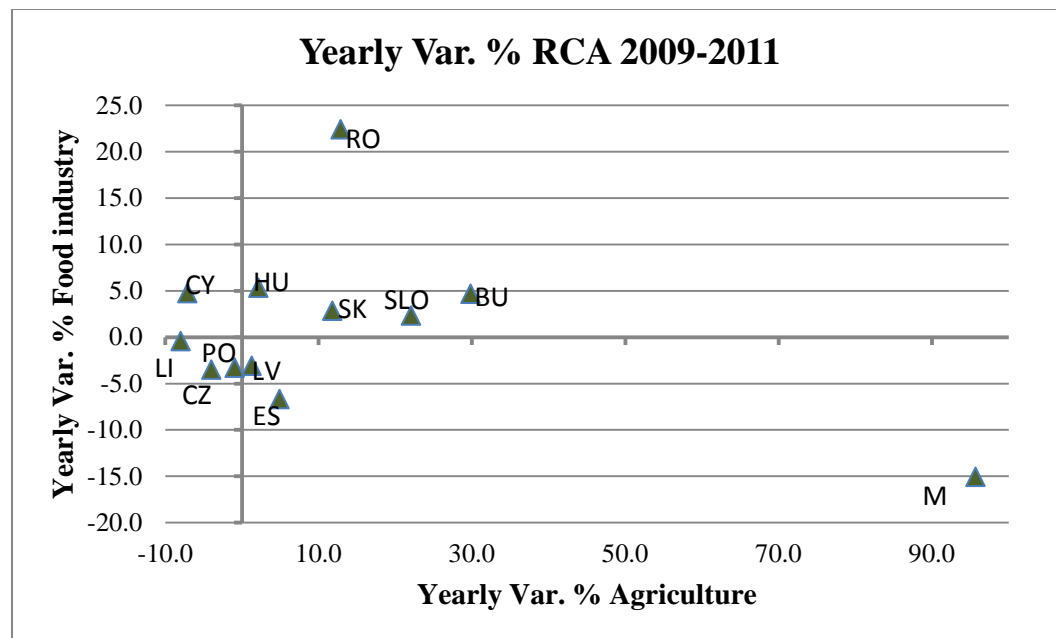
Generally, Finland continues to increase its export specialization in both sectors over the whole period. Austria and Sweden also improve, even though in the last sub-period this trend is only seen in agriculture. The United Kingdom, the biggest exporting country among the small ones, shows EMS specialization growth in both sectors during the EU enlargement and during the economic crisis. Portugal, after a period of growth, reduces its RCA during the crisis.

#### *The Export Specialization Performance of CEECs in Agriculture and Food Industry*

In the sub-period 2003-2008, there is an increase of export specialization in both sectors for all CEECs, with the exception of Cyprus (Figure 10).

In the sub-period from 2009-2011, only five out of twelve CEECs continue the specialization path in both sectors while three have an opposite trend, and the other three improve only in agriculture.





**Figure 10.** Export specialization of CEECs for agriculture and food industry in the periods 2003-2008 and 2009-2011

**Source.** Author's own calculations based on International Trade Eurostat database

## The Case of Italy

Italy showed only moderate competitive performance over the period analyzed, even though in the food industry it experienced low EMS growth. Even if it had maintained the fifth position among the EU countries in EMS in both sectors, exports increased during the last fifteen years, confirming recent studies on Italian agricultural and food exports (INEA 2013). In particular, in the pre-enlargement period, agriculture revealed a small decrease, whereas after the EU enlargement it recovered a bit. During the years of the economic crisis, agriculture showed a little decrease while the food industry bounced back. Although Italy had not shown remarkable growth rates, it demonstrated an ability to resist the significant events occurring in the last fifteen years, without being too “shocked”. Indeed, it has quite stable trends, and the economic crisis did not impact the food industry trade flows too much, as shown by the rise in the EMS even after the 2008.

According to Federalimentare<sup>3</sup>, the Italian Association of Food Industries, the Italian competitive performance could be connected to its strengths. For example, the wide variety of high-quality food products strictly linked to specific geographical areas, including the many traditionally certified foods (PDO-PGI) are exported abroad. Products such as “*made in Italy*” have registered highly competitive as exports increase (INEA 2013). Since these products represent 68% of the

<sup>3</sup> Rossi, D. (2014). “L’innovazione nell’industria alimentare italiana e la Piattaforma Food for Life”. Proceedings of the International Workshop ‘Innovare per affrontare le sfide del mercato globale: nuove opportunità per le PMI alimentari italiane’, Milano (Italy), 16 May 2014. Available on line at: [http://capinfood.eu/downloads/publications/proceedings\\_workshop\\_milano\\_16may2014.pdf](http://capinfood.eu/downloads/publications/proceedings_workshop_milano_16may2014.pdf)

total Italian food exports (INEA 2013), we could assert that the positive trend of the export indices is largely derived from them. Furthermore, Italy has high safety standards as a warranty for consumers, and possesses a strong ability to combine tradition with process and product innovation in order to create products like “*made in Italy*”, but also with convenience features.

On the other hand, the Italian food industry also has some weaknesses which hamper its ability to expand its presence in the international market. The Italian food sector is characterized by a large number of SMEs, which often have insufficient capacity to innovate (Wijnands et al. 2008). Logistics and service costs (energy, transports, infrastructures) are very high, reducing their ability to improve competitive indices and reach levels seen in countries such as Germany or the Netherlands. Finally, the absence of Italian retail chains in other countries also constitutes a bottleneck for the competitiveness of Italian food industry.

## Discussion

Our analysis revealed that in the intra-EU trade, there is a high concentration of EMS considering that the first six countries possess 76% of agriculture’s EMS and 71% of food industry’s EMS. In the former case, the largest share is the Netherlands (18.8%), whereas, in the latter case, Germany is the largest exporter (18.2%). Within this group of big countries, four of them (Spain, France, Netherlands, Italy) also have an RCA greater than 100 in agriculture, whereas Belgium and Germany are not specialized. For what concerns the food industry, all big countries are specialized, with the exception of Germany. Thus, a particular finding is that the country with the highest EMS does not reveal any specialization in the sectors analyzed, and this is due to the high level of total trade exports.

In the entire period analyzed, Germany and the Netherlands have been able to profit from opportunities connected to the EU enlargement. On the contrary, France has lost competitiveness, confirming outcomes of previous studies (Butault and Requillart 2012; Baudchon 2013). A similar trend was found in Belgium. Italy shows a substantial competitiveness stasis, similar to Spain (especially in the food industry).

The Netherlands has been the strongest performing country, among the big ones, in both sectors examined. It has reinforced its competitive position in both sectors even though it has slightly lost specialization, due to a rise in exports in other sectors that have affected the RCA value. Italy is characterized by smaller improvements in competitiveness, especially in the food sector.

Moreover, it should be noted that among the big countries, the agricultural EMS does not reveal high rates of growth in the second period and there was a negative tendency in the third period. Although, Germany and the Netherlands did experience high rates in the food industry during the second period, and EMS growth occurred in the third period for three other countries (Spain, Italy, and Belgium).

Thus, even though agriculture is strictly related to the food industry, there are different evolutions; indeed, in some cases the EMS trend of the two sectors analyzed goes in the same direction, whereas in other cases the trends are different, outlining a high case specificity.

The smaller countries experienced differentiated dynamics. In particular, Austria and Sweden benefited from the EU enlargement, increasing export specialization in both agriculture and the food industry, although they suffered like most of the EU countries, during the economic crisis, especially in the food industry. Denmark and the United Kingdom experienced a negative trend until 2008 but were able to recover during the economic crisis. It is noteworthy that the majority of the small countries increased their RCA in both sectors just after the EU enlargement.

Agriculture for the small countries shows different dynamics compared to those seen in the big countries. Indeed, there are high growth rates over the entire period analyzed. In the first and the second sub-period, five out of eight countries show an upward trend, and in the third sub-period, six out of eight countries made gains in competitiveness. Thus, while the food industry was the most expanding sector in the group of big countries, an opposite dynamic occurred in small countries showing high growth rates in agriculture, confirming the hypothesis that the two sectors have independent evolutions.

Admission into the EU constituted big EMS expansion opportunities for the CEECs, in both sectors. As Bojnec and Fertő (2012) also assert, during the economic crisis, their growth rates experienced a slowdown. Indeed, they found strongly increasing competitiveness indices, with some small exceptions (Cyprus and Malta), in line with the previous literature (Török and Jámboor 2013). Some CEECs, like Poland, highly increased their exports, especially in the food sector. The EU accession has enabled revival investments into the food industry, and food producers have been able to compete with competitors from old member states. Even though the EMS remains low in respect to other countries, the increasing trend of indices demonstrate that these countries have profited by the integration and have been able to well interpret the needs of European consumers and translate them into cheaper food products (Mroczek and Szczepaniak 2012). Specialization in agriculture and the food industry is very important to the CEECs. Even as dimensions of these sectors are limited, they still play a relevant role in the global economy of the country. Obviously, as seen in other countries, the economic crisis softened their specialization path. Generally, CEECs have gained in competitive performance, even as trade flows into Western countries are sometimes hampered by non-tariff barriers (e.g. standards, consumer protection, public health) (Juhász and Wagner 2013).

Nevertheless, we should be careful with the assessments on CEECs data, due to their very small absolute values, a little variation of EMS and/or RCA produce significant effects at a percentage level.

Focusing on the specific case of Italy, we underline that their competitive position in the EU market could be further enhanced by exploiting the opportunities connected to traditional and specialty products (which represent the strengths of the sector) and though introducing innovations in distribution channels.

The limitations of this study are related to the difficulty in highlighting the determinants of competitiveness starting with the trade indices. Thus, analyzing the determinants of country competitiveness could be an interesting topic for future investigation. Further research will be oriented towards better understanding the factors affecting competitive performance of agriculture and the food industry in different countries and perhaps exploring the variables

connected to food product quality with trade indices, or investigating the relationship between some socio-economic indices and trade.

## Conclusion

Our analysis highlights four main results. First, in the EU, a strong concentration of intra-trade flows is revealed both in agriculture and the food industry. Only six countries play a relevant role in trading: four of them are included among those countries with the highest GDP (Germany, France, Italy, Spain), and the other two are traditionally export-oriented countries (the Netherlands and Belgium). The United Kingdom is included in the group of small countries as it has a small market share in agri-food export within the EU.

Second, a relationship seems to exist between the competitive performance and (i) the country export specialization or (ii) the general export-orientation of the country. Indeed, in some cases good performance during the period analyzed seems to be linked with the export specialization in the sectors analyzed (agriculture and food industry) though this relationship needs an in-depth assessment. In the case of Germany, the opposite is true, good competitive performance is connected to the strong export-orientation of this country, namely the whole trade system pulls the sectorial competitive performance.

Third, our analysis inferred that although agriculture and the food industry are well interconnected sectors, their export trends follow different dynamics, at the time convergent or divergent. Therefore, it is not possible to highlight a general dynamic or identify which sector is pushing or pulling the other one. Thus, we could say that a high case specificity is revealed, and the hypothesis of an independent trend seems to prevail.

Fourth, the CEECs played a peculiar role in the period examined. Even though they cover marginal roles in the intra-EU agri-food trade, the analysis showed that they had good competitive performance connected with the EU enlargement, especially for what concerns agriculture. This positive trend decreased during the period characterized by the crisis, but in many cases we noticed positive evolutions.

Concerning the managerial implications, it is worth noting that the outlined trends at a sector level reflect the competitive performance of firms in different countries. Therefore, good sectorial results were derived from well-performing firms that profited by market opportunities resulting from the EU enlargement (Adams et al. 2006). This is the case for Germany, the Netherlands, Austria, Sweden and, partially, Italy.

Firms operating in agri-food activities have been less affected by the economic crisis in the later period of years analyzed than those in other industries due to the anti-cyclical nature of the food sector. Firms from the most competitive countries were able to identify and fully take advantage of the opportunities existing in the EU market during this period. Thus, a firm's capability to act in international markets is becoming more and more important, just as it is for small businesses to achieve successful results.

Consequently, even small and medium-sized enterprises, which are the backbone of the European agri-food sector<sup>4</sup>, should be aware of the great potential existing in export activities that can lead to satisfying economic performance, increased market share, external turnover, and a brand for domestic agri-food products abroad. Thus, they should not be afraid to investigate and development regular export activities into foreign markets.

However, as noted in previous literature (Gellynck et al. 2012; Banterle et al. 2011), good market orientation and marketing capabilities are necessary to fully understand the needs of destination countries and foreign consumers. Investments made in marketing and communication activities (market research, consumer surveys, trade fairs, etc.) help reduce the risk of failure and develop essential skills needed to succeed in exporting.

Continuous innovation is essential to keeping agri-food firms competitive in domestic and international markets. The agri-food sector has traditionally made low investments in R&D. Greater investment can lead to a higher competitive performance, innovative product lines which differ from the competitors and meet consumer needs. Thus, national or internationally funded research projects can provide one source to finance for start-up projects or through collaboration with universities or research centers.

Governments and policy-makers also play a pivotal role in supporting agri-food firms in export activities. They should develop national export policies as well as promote export activity by local producers. For example, building local networks of traditional agri-food producers can be a successful way to export a bundle of products under a common “umbrella label”, that is easily identifiable to foreign consumers and also promotes not only a single product from a single company, but the country as a whole.

Concerning the Italian case, firm internationalization should be supported and facilitated through several policy interventions that can help particularly SMEs. For example, tax reduction for foreign direct investments and market research, better knowledge of export managers about Italian foods’ quality attributes, better promotion of Italian food culture through appropriated campaigns, and building firm networks focused on exports could be successful tools to enhance the presence of Italian food firms in international markets (De Castro 2013).

## Acknowledgments

The paper was carried out within the research project “Improving the enabling environment and public awareness for innovation in the South-East-European food sector through transnational collaboration” (CAPINFOOD), which is a project financed by ERDF in the frame of the South East Europe Programme. Application ID: SEE/B/0027/1.3/X. The information in this document reflects only the authors’ views, and the Community is not liable for any use that may be made of the information contained therein. Preliminary results of the paper were presented at the 7<sup>th</sup> International European Forum on System Dynamics and Innovation in Food Networks, Igls-Innsbruck, Austria, 18-22 February, 2013. The authors thank the anonymous referees for their useful comments.

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<sup>4</sup> Eurostat database, [http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search\\_database](http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database)

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