

REGIONAL DIVERSITY OF ORGANIC FOOD SALES IN THE EUROPEAN UNION

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Abstract. The article discusses regional differences on the organic food market in the European Union based on retail sales data. The analysis was based on Eurostat, FiBL, IFOAM, USDA and literature data for 2016. Selected descriptive statistics were used. The analysis demonstrated considerable regional differences in both total and per capita retail sales of organic food on the EU market, which can be attributed to the unique characteristics of the compared countries. The absolute values of organic retail sales are influenced mainly by population and GDP. Per capita sales are strongly determined by GDP and final consumption expenditure of household. Therefore, organic retail sales were higher in countries with a higher GDP and higher household consumption per capita. Organic food sales and consumption were highest in Germany, France, Italy, the UK and Switzerland. The analysed variables were lowest in Cyprus, Slovakia, Lithuania, Latvia, Bulgaria, Hungary and Estonia.

Key words: organic market, organic farming, UE, organic food consumption, retail sales, expenses.

JEL code: D40, E21, I15, O1, Q13,

Introduction

Public concerns over environmental protection and food safety have been growing in Europe since the mid 1980s (Greenan K., Humphreys P., McIvor R., 1997). Consumers have a growing awareness about the harmful environmental impacts of conventional agriculture and the health implications of highly processed foods. Environmentally- and health-conscious consumers are increasingly likely to buy organic foods (Krystallis A., Chryssohoidis G., 2005). Organic farming is an agricultural management and production system that combines the most environmentally-sound practices with high levels of biological diversity, protection of natural resources, high animal welfare standards and production methods that meet the consumers' demand for foods produced with the involvement of natural substances and processes (Council Regulation (EC) No 834/2007). Most research studies indicate that consumers are more inclined to buy organic food due to the associated health benefits rather than for environmental reasons. According to most consumers, their purchasing decisions are more likely to be influenced by the unique attributes of organic food products that deliver direct benefits rather than the specific features of the organic production process that deliver indirect benefits for consumers (Wier M., Calverley C., 2002). For this reason, consumers increasingly often turn to foods produced in organic farms. This trend can also be attributed to an increase in disposable incomes in highly developed countries which have the largest organics markets. In contrast, high price premiums continue to suppress the demand for and the consumption of organic foods in less developed countries (Shafie F.A., Rennie D., 2012). Despite the above, the organic food sector has been the most dynamically growing segment of the European agrifood market in the past two decades. The above can be attributed to the high quality of organic foods, environmental concerns, healthy lifestyle and health problems, which are the top reasons given for buying organics (Basha M.B., Mason C., Shamsudin M.F., Hussain H.I., Salem M.A., 2015). At the same time, organic farming area and the number of organic food producers continue to increase despite strict regulations. Organic food production is highly subsidized (Brodziska K., 2015), which does not always contribute to an increase in the supply of organics in less developed countries, including Poland (Pawlewicz A., 2014). Despite the above, the sales of organic raw materials and processed products continue to increase each year around the world. This trend is observed in both highly developed countries as well as in less affluent states. In view of the above, two research hypotheses were tested in this study: H1 – organic retail sales differ across the EU; and H2 –

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organic retail sales are higher in countries with a higher GDP and higher household consumption expenditures. Therefore, the aim of this study was to evaluate the differences on the organic food market in the European Union based on organic retail sales.

In the first stage of the analysis, the research goal was pursued by selecting parameters describing organic retail sales in the EU countries based on statistical data. The analysed parameters were organic retail sales (million €), per capita consumption (€ per capita), organic crop area (fully converted and under conversion to organic farming, ha); area under organic farming (% of utilised agricultural area (UAA)); population, exports of organic foods (million €, for countries where these data were available), main GDP aggregates per capita (€ per capita), final consumption expenditure of households (total – million € and € per capita). Sales data were not available for all EU countries, and they were estimated by predicting the dependent variable based on literature data, media reports or the situation in countries with a similar level of development (as indicated in Table 2).

The analysis was based on Eurostat, Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International and U.S. Department of Agriculture (USDA) data. Some data were obtained from websites dedicated to domestic organic food markets. The data applicable to Malta were excluded from the analyses due to their incidental nature, and the information pertaining to Norway and Switzerland was included due to high organic sales and data completeness. The data for 2016 were subjected to a vertical analysis, whereas the data for 2004-2016 were processed by horizontal analysis. For comparative purposes, the analysed data were standardized based on the Harmonized Index of Consumer Prices (HICP) published by Eurostat. Selected descriptive statistics were used to determine regional variations, including the arithmetic mean, median, minimum, maximum and the coefficient of variation (Vc). Pearson's correlation coefficient was calculated to determine the relationships between the analysed parameters.

Research results and discussion

Organic farming area, including fully converted farms as well as farms under conversion, continues to increase around the world each year. Organic farming area increased from 35 million hectares in 2008 to nearly 58 million hectares in 2016, but it still accounts for only 1.2 % of total agricultural area in the world. Oceania (Australia) has a nearly 50 % share of global organics production, whereas Europe, mostly EU countries, has a nearly 25 % share. Oceania (Australia) also has the highest organic share of the total agricultural land - 6.5 %, followed by Europe - 2.7 %. In contrast, Asia and Africa have the highest number of organic producers in the world, which, combined with a small share of organic areas in their total agricultural land, points to considerable dispersion of small organic farms. Organic retail sales and per capita consumption were highest in North America and Europe (Table 1).

Table 1

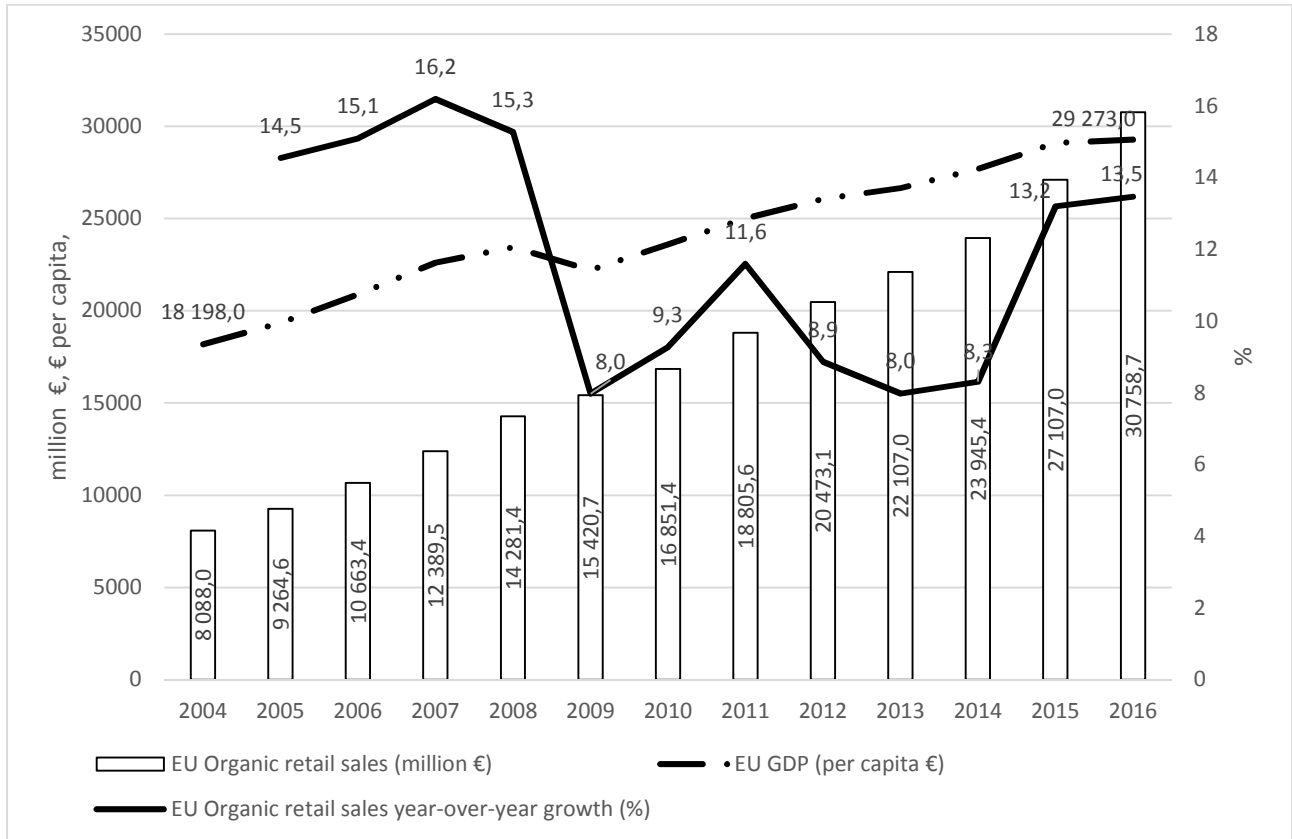
Organic farming and the global organic food market in 2016

Region	Organic agr. land	Share	Numbers of producers	Share of total agri. land	Retail sales	Per capita consumption
	ha	%	no	%	Million €	€
Africa	1801699	3.12	741367	0.2	16	-
Asia	4897837	8.47	1108040	0.3	7343	1.7
Europe	13509146	23.36	373240	2.7	33526	*40.8
Latin America	7135155	12.34	458532	0.9	810	1.3
North America	3130332	5.41	18422	0.8	41939	117.0
Oceania	27346986	47.30	27366	6.5	1065	26.5
World	57821155	100	2726967	1.2	84698	11.3

* UE in 2016 – 60.1 €

Source: author's calculations based on *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348.

Organic retail sales continue to increase in the European Union (and in all of Europe) each year. In 2004, the value of the EU organic market exceeded 8 billion €. The market grew by 14 % in 2005, and this dynamic increase was maintained until 2007 (16.2 % increase to more than 12.3 billion € relative to 2006).



HICP-administered prices (2015 = 100)

Source: author's calculations based on *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348; HICP (2015 = 100) - annual data (average index and rate of change) [prc_hicp_aind] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 10.12.18; Main GDP aggregates per capita [nama_10_pc] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 07.12.18.

Fig. 1. Organic retail sales and their growth rates in the EU in 2004–2016 at constant prices in 2015

Organic retail sales slowed down after 2008, and year-over-year growth reached 15.3 %. In 2009, the market grew at 8 % with sales reaching nearly 15.5 billion €. The above can be linked to the global financial crisis of 2008–2009. Negative changes were also observed on agricultural markets (Borawski P., Beldycka-Borawska A., Dunn J.W., 2018), which weakened the consumers' purchasing power and influenced decision-making on the organic market (Orboi M.D., 2013). The above observations are highly consistent with the drop in GDP per capita (in €) in the EU in the corresponding time period. A new period of dynamic growth on the organic market began in 2009, and sales reached 18.8 billion € in 2011. By 2013, market growth decreased to 8 % relative to 2012. Despite this slowdown, the organic food market continued to increase to 22.1 billion €. Year-over-year growth increased between 2013 and 2015 when the market was valued at 27.1 billion €. In 2016, the growth rate decreased and retail sales topped 30.7 billion € (fig. 1).

Differences in value of the organic food market were evaluated based mainly on an analysis of retail sales. The coefficient of variation for organic retail sales revealed extreme heterogeneity ($V_c = 184.4\%$) among the analysed countries, with an average value of 1 157.3 million € and a median of 150 million €. Organic retail sales are highest in Western Europe, and Germany is the largest market (9 478 million €). In 2016, organic retail sales were also high in France (6 736 million €), Italy (2 644 million €), the United

Kingdom (2 460 million €) and Switzerland (2 298 million €). Relatively high values were also noted in Sweden (1 944 million €), Spain (1 686 million €), Austria (1 542 million €), Denmark (1 298 million €) and Netherlands (1 171 million €). Organic retail sales were lowest in Cyprus (2 million €), Slovakia (4 million €), Lithuania (10 million €), Latvia (10 million €), Bulgaria (27 million €), Hungary (35 million €), Estonia (36.6 million €), Portugal (38.8 million €), Romania (39.5 million €). Detailed data are presented in Table 2.

The observed differences can be attributed mainly to differences in the economic development of the analysed countries. Organic retail sales peaked in highly developed European countries characterized by high incomes and high levels of environmental, economic and health awareness where high price premiums do not drive down sales. It should also be noted that organic production in the „new“ EU Member States is mostly export-oriented (Orboi M.D., 2013). This observation is validated by statistical data which indicate that final consumption expenditure of households (million €) ($r=0.858$; $p<0.001$) and population ($r=0.813$; $p<0.001$) are bound by a strong positive correlation with organic retail sales. It should also be noted a fairly weak relationship indicating that, with the growing general retail sales, sales per capita are growing ($r = 0.372$, $p < 0.05$) (Table 3).

The per capita consumption of organic food is an equally important indicator of the size of organic markets, and it supports a comparison of European regions. Consumption levels are a reflection of the purchasing power and the environmental awareness of consumers who are willing to buy more expensive organic products. Therefore, per capita expenditure can be regarded as a measure of the standard of living. Per capita retail organic sales in the EU were highly varied in the analysed year ($V_c = 123.5\%$), with an average of more than 62 € (in UE 60.1 €) and a median of 32,7 €. Spending on organic food was highest in the Scandinavian and Alpine countries, including Switzerland - 276 €, Denmark - 227.4 €, Sweden - 197.3 €, Luxembourg - 187.4 € and Austria - 177.2 €. In Germany (115.3 €) and France (100.9 €), the average retail sales per capita were less than half the values reported in Switzerland. The lowest retail sales per capita were noted in Slovakia - 0.7 €, Romania - 2 €, Lithuania - 3.5 €, Hungary - 3.6 €, Bulgaria - 3.8 € and Portugal - 3.8 € (Table 2). These findings emphasize the dominant role of affluent countries where high price premiums do not decrease the demand for organic food.

Table 2

Variables characterizing the organic food market in the EU in 2016

Specification	A	B	C	D	E	F	G	H	I
	ha	% of UAA	Million €	€ per capita	persons	Million €	€ per capita	Million €	€ per capita
EU	11931885	6.7	30758.7	60.1	510277177		29200	8098087.1	15870.0
Austria	571423	21.3	1542	177.2	8700471		40800	178675.5	20536.3
Belgium	78452	5.8	586	51.8	11311117		37600	212141.5	18755.1
Bulgaria	160620	3.2	**27	3.8	7153784		6800	28998.2	4053.6
Croatia	93593	6.1	*137.1	32.7	4190669		11200	26072.7	6221.6
Cyprus	5550	4.9	**2	5.0	848 319		21700	12507.4	14743.8
Czechia	488591	14.0	*80.2	7.6	10553843	59	16700	81862.7	7756.7
Denmark	204950	7.8	1298	227.4	5707251	329	49200	128014	22430.1
Estonia	180852	18.0	***36.6	27.8	1315944		16500	10777.3	8189.8
Finland	238240	10.5	273	49.8	5487308		39300	113372	20660.8
France	1537351	5.3	6736	100.9	66730453	629	33300	1164859	17456.2
Germany	1135941	6.8	9478	115.3	82175684		38400	1622135	19739.8
Greece	342584	6.5	**95	8.8	10783748		16400	117180.6	10866.4
Hungary	186322	3.5	**35	3.6	9830485		11600	54691.4	5563.5
Ireland	76701	1.7	150	31.7	4726286		57500	89465.4	18929.3
Italy	1796333	14.0	2644	43.6	60665551	1915	27900	1012573.2	16691.1
Latvia	259146	13.4	**10	5.1	1968957		12800	14751.1	7491.8
Lithuania	221665	7.5	10	3.5	2888558		13500	24782.6	8579.6
Luxembourg	4528	3.5	108	187.4	576249		91300	15400.1	26724.7
Netherlands	52204	2.9	1171	69.0	16979120	1200	41600	310430	18283.0
Norway	47621	4.9	394	75.6	5210721		64100	143778.1	27592.8
Poland	536579	3.7	**219.7	5.8	37967209		11100	246103.8	6482.0
Portugal	245052	6.8	***38.85	3.8	10341330		18100	118037	11414.1
Romania	226309	1.7	**39.55	2.0	19760314		8600	105083.9	5317.9
Slovakia	187024	9.8	4	0.7	5426252		15000	43579.1	8031.2
Slovenia	43579	9.1	*58.68	28.4	2064188		19500	21187	10264.1
Spain	2018802	8.5	1686	36.3	46440099	891	24100	631793	13604.5
Sweden	552695	18.3	1944	197.3	9851017	84	46700	200784	20382.1
Switzerland	141249	13.5	2298	276.0	8327126		72400	313597.3	37659.7
UK	490205	2.8	2460	37.6	65382556		36600	1507354.7	23054.4
arithmetic mean	418074.5	8.1	1157.3	62.61	18047055.5	729.6	31044.8	294827.2	15085.4
median	221665	6.8	150	32.72	8700471	629.0	24100.0	117180.6	14743.8
minimum value	4528	1.7	2	0.7	576249	59.0	6800.0	10777.3	4053.6
maximum value	2018802	21.3	9478	276.0	82175684	1915.0	91300.0	1622135.0	37659.7
standard deviation	531369.3	5.3	2133.4	77.3	23163736.9	669.5	21004.6	449129.4	8116.0
coefficient of variation	127.1	64.9	184.4	123.5	128.4	91.8	67.7	152.3	53.8

Estimates based on: * predictions of the dependent variable; ** literature data or media reports; *** analogy (%) with countries with similar levels of development.

A – Total fully converted and under conversion to organic farming; B – Area under organic farming (% of utilised agricultural area (UAA)); C – Retail sales, D – Per capita consumption; E – Population; F – Exports; G – Main GDP aggregates per capita; H, I – Final consumption expenditure of households

Source: author's calculations based on *The World of Organic Agriculture. Statistics and Emerging Trends 2018*. Willer, Helga and Julia Lernoud (Eds.). Research Institute of Organic Agriculture (FiBL), Frick, and IFOAM – Organics International, Bonn, 2018, p. 348 (ABCDF); Population on 1 January by age and sex [demo_pjan] Eurostat.

<https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18 (E); Main GDP aggregates per capita [nama_10_pc] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 07.12.18 (G); GDP and main components (output,

expenditure and income) [nama_10_gdp] Eurostat. <https://ec.europa.eu/eurostat/data/database>. Access: 11.12.18 (HI).

The discussed phenomenon is validated by the results of the correlation analysis which revealed a strong correlation between the size of the organic food market and the levels of economic development in the analysed countries. Organic retail sales per capita increased with a rise in GDP per capita (€ per capita; $r=0.773$; $p<0.001$). Per capita consumption of organic products also increased with a rise in Final consumption expenditure of households (€ per capita) ($r=0.797$; $p<0.001$) (Table 3).

Table 3

Descriptive statistics and matrix of coefficients of correlation between variables (N=29)

	Mean	SD	A	B	C	D	E	F	G	H	I
A	418074.5	531369.3	1								
B	8.1	5.3	.200	1							
C	1157.3	2133.4	*.613	.041	1						
D	62.6	77.3	.038	.341	***.372	1					
E	18047055.5	23163736.9	*.785	-.143	*.813	.016	1				
F	729.6	669.5	.479	-.252	.169	-.426	.619	1			
G	31044.8	21004.6	-.095	.011	.216	*.773	-.029	-.161	1		
H	294827.2	449129.4	*.681	-.091	*.858	.145	*.956	** .943	.126	1	
I	15085.4	8116.0	.024	.112	.350	*.797	.124	.077	*.916	.307	1

correlation coefficient significant at *0.001, **0.01 and ***0.05

where: A – Total fully converted and under conversion to organic farming (ha); B – Area under organic farming (% of utilised agricultural area (UAA)); C – Retail sales (Million €); D – Retail sales (€ per capita); E – Population; F – Export (Million €, N=7); G – Main GDP aggregates per capita (€ per capita); H – Final consumption expenditure of households (Million €); I – Final consumption expenditure of households (€ per capita)

Source: author's calculations based on data from Table 2

Conclusions, proposals, recommendations

The organic food market continues to grow on all continents, but the highest growth rates are observed in Europe. The above is driven by higher demand for organic food, which can be attributed to growing levels of environmental and health awareness as well as an increase in the purchasing power of European consumers. At the same time, organic farming subsidies increase production levels and, consequently, augment the supply of organic products. Price premiums stifle demand and pose the greatest obstacle to the development of the organic food market. The differences in the prices of organically and conventionally produced foods are likely to diminish with an increase in the supply of organic food products, which will drive the demand for such products.

The results of this analysis point to considerable differences in the retail sales and per capita consumption of organic food in the EU. The observed variations can be attributed mainly to heterogeneity in economic development expressed by GDP and consumer expenditure in the evaluated countries. The analysis also revealed an interesting relationship. In absolute terms, organic retail sales are determined mainly by population and GDP per capita, which indicates that organic sales are highest in the countries with a high number of relatively wealthy inhabitants. In turn, organic consumption per capita is strongly affected by GDP and consumption expenditure. Therefore, countries with a higher GDP per capita and higher final consumption expenditure of household are characterized by higher retail organic sales. The analysis revealed that the sales and consumption of organic food are highest in Germany, France, Italy, the UK and Switzerland, whereas per capita consumption is highest in Switzerland, Denmark, Sweden, Luxembourg and Austria. The newest EU Member States (Slovakia, Lithuania, Latvia, Bulgaria, Hungary and Estonia) are characterized by lower sales and consumption of organic products as well as the smallest organic food markets, with Cyprus being the leader in this group of countries.

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Time schedule of the conference

Preparation of the proceedings and organization: January 2019 – May 2019

Conference: 9-10 May 2019

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Foreword

The international scientific conference „Economic Science for Rural Development“ is organized annually by the Faculty of Economics and Social Development of Latvia University of Agriculture.

The proceedings of the conference are published since 2000.

The scientific papers presented in the conference held on 9-10 May 2019 are published in 3 thematic volumes:

No 50 Rural Development and Entrepreneurship
Production and Co-operation in Agriculture

No 51 Integrated and Sustainable Regional Development
Marketing and Sustainable Consumption

No 52 New Dimensions in the Development of Society
Home Economics
Finance and Taxes
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The proceedings contain scientific papers representing not only the science of economics in the diversity of its sub-branches, but also other social sciences (sociology, political science), thus confirming inter-disciplinary development of the contemporary social science.

This year for the first time the conference includes the section on a new emerging kind of economy-bioeconomy. The aim of bioeconomy is to use renewable biological resources in amore sustainable manner. Bioeconomy can also sustain a wide range of public goods, including biodiversity. It can increase competitiveness, enhance Europe's self-reliance and provide jobs and business opportunities.

The Conference Committee and Editorial Board are open to comments and recommendations concerning the preparation of future conference proceedings and organisation of the conference.

Acknowledgements

The Conference Committee and editorial Board are open to comments and recommendations for the development of future conference proceedings and organisation of international scientific conferences.

We would like to thank all the authors, reviewers, members of the Programme Committee and the Editorial Board as well as supporting staff for their contribution organising the conference.

On behalf of the conference organisers

Anita Auzina

Associate professor of Faculty of Economics and Social Development
Latvia University of Life Sciences and Technologies

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