

DRIVING FORCE OF ORGANIC FARMING IN THE CZECH REPUBLIC – MARKET DEMAND OR FINANCIAL SUPPORT?

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ABSTRACT

In the Czech Republic, and possibly in many other eastern European countries, organic production still has potential for further growth. Over the past three decades, organic farming has become an essential alternative to farming practices. An increase was observed among acreage, the number of farms, and also consumer spending on organic production. After the EU accession, organic farming became part of the agricultural policy related to other than production function and therefore supported by EU finance. The contribution aimed to derive which of the two factors was more important for organic farming expansion – the pull factor (market demand) or the push factor (financial support). Using Pearson's correlation coefficient stronger relationship was observed for financial aid, which was a driving force for the organic agriculture spread in the Czech Republic.

Key words: correlation, Czech Republic, organic agriculture, financial support, organic market

JEL codes: Q13, Q14, Q18

INTRODUCTION

Sustainability is a crucial topic in today's agricultural policy discussion. The agrarian sector struggles to follow the growing global population and rising global demand. Besides, agriculture must reduce negative environmental impact (Thematic Group on Sustainable Agriculture and Food Systems, 2015). Increased demand for food triggered innovations in agriculture. The development of science and new technologies supported the production of high-yielding varieties. The use of chemical fertilisers and pesticides stabilised yields (Savari Ebrahimi-Maymand and Mohammedi-Kanigolzar, 2013); however, problems occurred alongside innovations applied. Namely, the farming

sector contributes significantly to Green House Gases pollutants (Johnson et al., 2007). All segments of agriculture have management options that can reduce agriculture's environmental footprint (Johnson et al., 2007). Organic production systems are closer than other low-input methods to the definition of a sustainable system (Hall et al., 1989). At the same time, there are socio-economic and environmental benefits related to organic farming (for ecological benefits, see Häring et al., 2001; Reganold and Wachter, 2016; Smith et al., 2019).

Socio-economic benefits include higher labour intensity resulting in a higher number of employees (Green and Maynard, 2006). Häring et al. (2001) concluded that organic and conventional farms have

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comparable income. Vlašicová and Náglová (2015) concluded that organic winemaking enterprises have higher profitability and higher solvency. On the contrary, according to Offermann and Nieberg (2010), profitability per hectare is generally lower on organic farms and material, energy, fertilisers, and pesticides costs (Mäder et al., 2002). Charges related to wages and salaries are higher in organic farms (Offermann and Nieberg, 2010; Aulová and Frýdlová, 2012).

In the European Union, about 10 million farms are employing more than 22 million people. In the countryside, many more jobs are linked to farming in upstream and downstream sectors. Farming specifics and expectations to produce public goods contributed to the specially designed policy targeted on the multifunctionality of agriculture, implementing the number of Community objectives beyond the traditional concept of agriculture related to food production (Weiss and Bitkowska, 2014).

The European Union supports organic farming as part of its environmentally oriented agricultural policy. The EU allows farms to make their own decision on transformation related to organic agriculture. Total acreage under organic practices has constantly been growing over the last three decades (Willer and Lernoud, 2015; Willer et al., 2020). In 2018, organic agriculture was represented by about 330 thousand producers and covered 7.7% of total EU farmland. Total EU organic sales exceeded 37 billion EUR in 2018. The average spending of the EU consumer for organic products was counted to be about 76 EUR, compared to 43.8 EUR in 2013. The EU accounted for about 37% of the global organic food and drink market (Willer et al., 2020).

The main aim of the paper is to clarify which of the two factors is more critical for farms' transformation to organic production. The two factors targeted are (i) the push factor – financial support; and (ii) the pull factor – market demand.

MATERIALS AND METHODS

The article uses secondary data available related to organic farming. Most of the data were sourced from the Czech Ministry of Agriculture, Eurostat, and European Commission and reports of the Research

Institute of Organic Agriculture (FiBL). Time series are related to data availability. The strength of factors affecting farmers' motivation to start with organic farming was measured by the correlation matrix. Following data were used (i) organic acreage (1990–2018); (ii) several farms (1990–2019); (iii) special and targeted financial support provided for organic entities sourced both from national and EU sources (1998–2019); (iv) organic products consumption (2005–2019). The data were processed using Pearson's correlation coefficient ($\alpha = 0.05$) using the MS Excel data analyses tool. To unify time series, correlation matrix analyses used 2005–2019 data ($df = 13$). Unfortunately, the total volume of support (incl. supportive measures available to conventional farms as 1st pillar of CAP; Areas facing natural or specific constraints – ACN; etc.) provided to farms was not reachable.

Corporate farms were not included, as they have a particular position related to size. Average Annual Growth Rate (AAGR) was calculated as the geometric mean of individual annual growth rates. The yearly average CZK/EUR exchange rate was used, published by the Czech National Bank.

RESULTS AND DISCUSSION

First organic farms operating in the Czech Republic/Czechoslovakia were observed in 1990. Just after the Velvet Revolution (1989) and market orientation first three farms acreage under Organic farming reached 480 ha. Since then the positive development has been observed (Fig. 1). In 2018, 4 606 organic farms managed almost 540 thousand ha, i.e. 14% of utilised agricultural land. The increase of land converted into organic is highly correlated to support provided. **Initial financial support measures were released between 1990 and 1992.** However, the first comprehensive subsidy program helped non-productive functions being in force between 1998 and 2003. **The first comprehensive support resulted in a significant increase in acreage.** Between 1997 and 1998, the acreage of farmland under Organic agriculture more than tripled from 20 to 71 thousand ha. After joining the European Union in 2004, support for organic farming mainly was provided from CAP resources.

Total support for organic farms increased over time. As seen in Table 1, in 1998, complete support sourced by organic farms exceeded 1 million EUR. After the EU accession, a continuous increase in farms and their acreage resulted in the increased value of support provided. In 2010 the total value of support exceeded 50 million EUR and since then has increased only slightly. Values expressed in Table 1 do not precisely present continuous increases, but the volatility of the

Czech currency influences presented values. In 2019, the Ministry paid out special organic farm support of almost 57.3 million EUR.

Arable land and permanent grassland have an equal share in the EU. Both land categories cover about 40% of the land used under organic production (Willer et al., 2020). However, in the Czech Republic (Table 2), most organically managed land is permanent grassland representing more than 80%

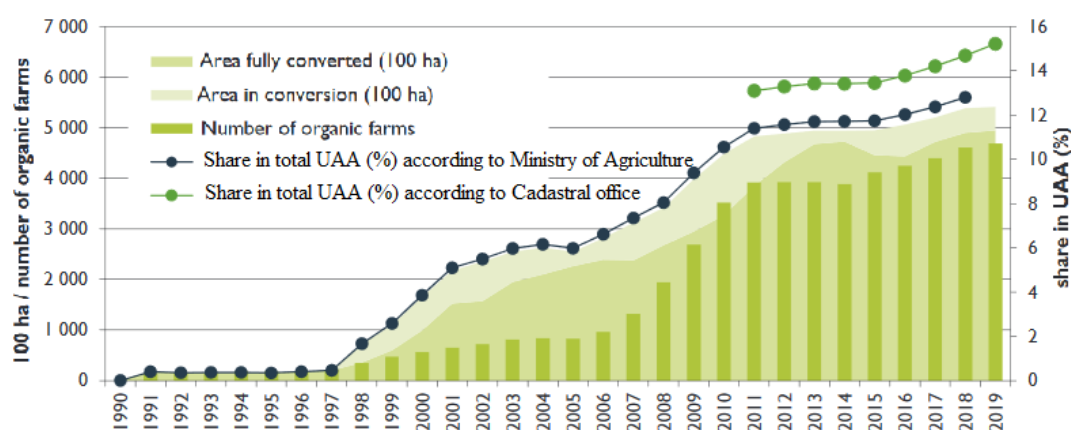


Figure 1. Development in total of acreage, number of organic farms and share of total agricultural land
Source: Ministry of Agriculture of the Czech Republic (2020).

Table 1. Total value of targeted support to organic farms, the Czech Republic

Support	Year										
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Million EUR	1.30	2.28	2.50	4.93	6.85	7.26	9.75	10.24	10.59	19.45	27.75
Support	Year										
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Million EUR	37.43	45.99	50.43	50.84	48.59	46.20	48.46	49.28	52.83	53.94	57.22

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

Table 2. Land types under organic management, the Czech Republic

Land use	2005	2019	2005	2019
	ha		%	
Arable and crops	20 766	90 530	8.1	16.7
Permanent grassland	209 956	443 985	82.3	82.1
Permanent crops	820	6 265	0.3	1.2
Other	23 440	214	9.2	0.0
Total	254 982	540 994	100.0	100.0

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

of organic acreage located mainly in mountainous border regions. Other land types under organic management have low significance. A positive trend is observed among arable land as its share increases slowly. Total acreage almost quadrupled between 2013 and 2018. Distribution of land types informs about farming management – organic farms are instead focused on extensive farming practices rather than on intensive production. However, an increasing share of arable land is a positive sign for other increased intensive farming practices. The average Organic farm managed about 115 ha in 2019 while continuously decreasing. In 2005, the average organic farm was operated on about 307 ha.

The share of organic food consumption in the Czech Republic is around 1.2%. In contrast, the market in Denmark was about 13.3%, Sweden and Austria close to 9%, France, Germany and the Netherlands close to 5%. This only presents the market potential for organic value-added production. As observed in Table 3, certain commodities do not have the potential yet to be sold as organic (goat, lamb, beef, grapes, leaf vegetable, oilseed, etc.). At the same time, others are already well accepted and demanded by the consumers (eggs, cow milk, honey). Also, as presented in Table 4, there is an increasing trend in organic fruits and vegetable consumption (+11% annually) and in bakery, confectionery and other flour products (about 15% annual increase). Also, the potential for further sales is observed in other marketing channels than supermarkets and hypermarkets. Although the market

power of large retail chains is significant, over a decade, their importance declined (Table 4). The increasing importance of organic food outlets is observed among gastronomy, independent retail, e-commerce, and direct farm-gate sales.

In 2016, 96% and in 2017 95% of organic farms were profitable. The profitability of organic farms is mainly given by available support provided by Rural Development Funds (presented in Table 5). Those are being provided to farms certified as organic and farms being in the transition period from conventional to organic farming (2 years for arable lands, three years for permanent crops like hops, vineyards, orchards). The difference in supportive values is explained mainly by labour and technical requirements related to organic agriculture. Permanent crops are supported the most, while grasslands and fallow lands are supported the least. Other supportive measures are related to project calls and target innovations, diversification of activities, supporting rural tourism, young farmers, cooperation among farmers to share machines and facilities (Table 6). In all those cases, organic farmers are given a bonus for project evaluation. This bonus increases the chances of success in the project selection process. Financed projects submitted by organic farms were granted more than 28 million EUR (about 32% of all awarded projects).

When observing the great growth history of the organic market (growing over 10% annually – Table 4) and the increase of acreage and number of farms under organic management, the question

Table 3. The utilisation of organic food, the Czech Republic, 2019

Product	Sold as organic (%)	Product	Sold as organic (%)
Cereals	78	Pears	68
Legumes	71	Grapes	50
Potatoes	94	Beef meat	41
Oilseeds	73	Lamb	14
Herbs	61	Goat meat	2
Cruciferous vegetables	35	Pork	56
Leaf vegetables	53	Poultry	91
Fruit vegetable	84	Cow milk	83
Root vegetables	99	Eggs	98
Apples	81	Honey	100

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

Table 4. Organic food – indicators (2007–2018), the Czech Republic

Specification	2007–2009 average	2010–2012 average	2013	2014	2015	2016	2017	2018	AAGR (%)
Total turnover with organic food, including exports (million EUR)	67.7	89.9	104.7	115.9	136.7	155.0	216.5	273.8	16.7
Organic food consumption in CZ (million EUR)	59.8	67.3	75.1	73.4	82.5	94.3	126.5	172.8	12.7
Consumption per person per year (EUR)	5.8	6.4	7.1	6.9	7.8	8.9	11.9	16.2	12.3
Share in organic food turnover									
Supermarkets/hypermarkets	70.2	68.6	67	57.4	60.9	61.8	58	51.1	–2.5
Independent retail	2.3	1.3	1.6	1.7	4.2	2.9	3.0	2.1	–1.6
Farm gate sale, direct sale	2.4	4.9	8.9	6.7	7.0	7.3	5.4	9.5	15.2
Gastronomy	0.6	0.8	1.4	2.9	3.2	3.4	3.0	4.7	22.6
e-Shops	N/A	N/A	N/A	3.4	7.8	6.7	14.1	8.0	23.9
Share of product category on total consumption									
Meat and meat products	7.0	8.4	6.9	8.2	6.9	5.1	5.9	4.6	–2.7
Fruit and vegetable	7.5	12.7	16.1	13.7	12.6	21.3	22.5	17.3	11.2
Milk and dairy products	21.4	21.5	18.2	22.0	20.0	23.0	17.5	20	–0.4
Mill and starch products	6.1	9.5	11.7	8.2	7.5	4.8	4.9	2.5	–7.7
Bakery, confectionery and other dairy products	4.9	9.0	9.2	9.4	7.3	6.2	5.9	7.6	15.2
Other processed foods	43.7	34.1	33	33	37.1	33.2	36.4	41.4	–1.6

*Growth rate of e-commerce measured between 2014 and 2017.

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

Table 5. Supporting organic farming, per hectare values, the Czech Republic, 2019

Commodity type	Transitional period (EUR/ha)	Organic farming (EUR/ha)	2014
Permanent grassland	84	83	71 / 89
Arable land	Vegetables or herbs	536	466
	Strawberry	669	583
	Grass for seed	265	180
	Other crops	245	180
	Grassland	79	69
	Fallow land	34	29
Permanent crops	Orchard – intensive	825	779
	Orchard – other	419	417
	Vineyard	900	845
	Hops	900	845
Another permanent culture with an ecologically significant element of landscaping	165	165	X

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

Table 6. Additional project support provided, the Czech Republic, 2018

Specification	Number of projects	Support (million EUR)
Investment in agricultural holdings	568	14.63
Processing and marketing of agricultural products	61	2.57
Aid for setting up of young farmers	100	4.68
Investments in non-agricultural activities	49	2.42
Support for rural tourism	27	2.68
Cooperation for development of new products, processes and technologies	1	0.98
Cooperation among small operators in organising joint work processes and sharing facilities	4	0.54
Total	810	28.48

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2019).

Table 7. Data input for the correlation analyses, the Czech Republic

Year	Support (million EUR)	Consumption (million EUR)	Number of farm	Acreage (ha)
2005	10.24	17.1	829	254 982
2006	10.59	26.8	963	281 535
2007	19.45	46.5	1 318	312 890
2008	27.75	72.2	1 946	341 632
2009	37.43	60.9	2 689	398 407
2010	45.99	63.3	3 517	448 202
2011	50.43	67.9	3 920	482 927
2012	50.84	70.8	3 923	488 483
2013	48.59	75.1	3 926	493 896
2014	46.2	73.4	3 885	493 971
2015	48.46	82.5	4 115	494 661
2016	49.28	94.3	4 243	506 070
2017	52.83	126.5	4 399	520 032
2018	53.94	172.8	4 606	538 223
2019	57.22	200*	4 690	540 993

*Own estimations.

Source: the authors' elaboration based on the Ministry of Agriculture of the Czech Republic (2020).

remains – was the market demand driving a transformation of farms from conventional farming to organic? A combination of information from Tables 3 and 4 provides a partial answer. As mentioned above, organic agriculture is extensive, employing a lot of pastures for grazing livestock (cattle, sheep, goat) production. However, produced meat is not sold afterward as organic. Only 41%, 14%, and 2% of beef, lamb, and goat meat produced were sold

as organic in 2019. A better situation is observed among intensive crops.

The processed correlation analyses support that financial support was a more important driving force for organic expansion than increasing demand (Tables 7 and 8). Although time series was not as long as desired, the push factor (supportive financial measure available) had a higher impact on the growth of farms number ($r = 0.989$)

Table 8. Correlation for data range 2005–2019, the Czech Republic

Relationship	<i>r</i>	<i>t</i> -statistics	<i>p</i> -value (2tail)	Statistical sign.
support (x_1) – number of farms (y_1)	0.9895	24.7260837	2.57512e-12	yes
support (x_1) – acreage (y_2)	0.9864	21.65880074	1.38669e-11	yes
consumption (x_2) – number of farms (y_1)	0.7494	4.080825231	1.30e-03	yes
consumption (x_2) – acreage (y_2)	0.7521	4.114764682	1.22e-03	yes

Source: own calculations.

and acreage ($r = 0.986$) than the market had itself on farm number ($r = 0.795$) and acreage ($r = 0.752$). All values are statistically significant at $\alpha = 0.05$.

CONCLUSIONS

In the Czech Republic, and possibly in many other eastern European countries, organic production still has potential for further growth. As proven above, the farming transformation was mainly driven by available funds rather than market demand. Extensive farming focused on pastures and cattle production is possibly not the perfect path – from the viability point of view. A lot of produced beef is not sold as organic due to market oversupply. On the contrary, we observed slow but increasing total acreage dedicated to crop production.

For the next multiannual financial framework of the EU (2021–2027), the total amount of funds dedicated to the Common Agriculture Policy will be lowered. The share of organic food consumption in the Czech Republic is around 1.2%. It is evident that Czech consumers still do not spend as much on organic produce as consumers in western European countries. Still, a rapid future increase is expected (historically, there was about a 10% average growth rate). Farming newcomers still can find their niche market and success. In the past, the transformation from conventional to organic practices was simplified by available subsidies and grants. The situation is expected to remain, but the pull factor (market demand) importance is expected to play a more critical role as farm-gate sales, e-commerce and hotel, restaurant, and coffee outlets are the future drivers of organic market development. As those expectations are not supported by

any data or research, there exists a possible niche for further investigation.

Acknowledgements

This paper is supported by a grant of National Agency for Agricultural Research (NAZV). The project title is 'Dualita v českém zemědělství: výhoda nebo nevýhoda pro zemědělství nové generace?' (QK1920398).

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