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Price premium dynamics of some chosen organic foods on the Bulgarian market

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Running title: **Price analysis of organic and conventional food products**

Abstract
The development of the organic foods market in a worldwide scale is at its 3.0 phase, according to IFOAM (IFOAM, 2016). As opposed of the previous phase 2.0, which was based on the price premiums of the organic foods, this phase is inspired by the concept of the true value and pricing based on the real costs in the sector.
The aim of the present paper is to observe the price trend of some organic foods on the Bulgarian market with the purpose to analyze which phase it is on and to predict its future development. On the base of previous empirical studies, the actual prices of chosen categories of organic foods are compared for a two-year period. The dynamics of their price premium is investigated, in comparison with the price level of the conventional analogues. As a result of the data aggregation three effects were established: two net - the price premium for 2018 (120%), the change in the price premium in comparison to 2016 decrease (10%) and one combined effect of the movement of prices of conventional analogues (4%).

Practical applications
Considered as a strategic business sphere, the sector of production of processed organic food is characterized by certain features - trends, favorable opportunities and threats. Determining the dynamics of the pricing premium gives us knowledge about the maturity of the market, as well as about the available barriers and level of competition. We establish the volatility of consumer prices of processed organic and conventional products in the period august 2016 - august 2018 in retail outlets, through the dynamics in the price premium. The approach used to calculate the pricing premium gives us reason to assert that not only the variable (Po) i. e. prices of organic products has a decisive role in defining the boundaries of the sector, respectively its market potential, but also variable (Pc), reflecting the prices of their conventional analogues, because of the price cut between them.

Key words: organic food products, price analysis, price premiums, marketing research

Introduction

Agriculture and food industry have undergone many transformations in an effort to meet the consumers`demand for clean, non-pollutted and healthy food at an affordable price. Organic food meets many of the requirements, but its price is still higher than the price of the conventionally produced food, and thus can not contribute to addressing these needs globally.

On the other hand, the organic farmer invests time, knowledge and resources to convert from conventional to organic and livestock farming to meet the strict requirements of the certification body, with the idea that the sale price will compensate for missed opportunities and markets.

The optimization of the producers behavior over time is guided by the price premium index,[1] i.e. the percentage by which the sale price of a particular organic product exceeds the price of a conventional analogue. This information is also important for other market participants - processors, traders, exporters and importers.

In this study, we accept that the price premium has a compensatory function that satisfies the interests of producers and traders in circumstances of risk, and for consumers this is the price paid to consume healthy and cleaner food. The decision on the consumption of organic food is influenced not only by the variable price premium, but also by other market, political, cultural and other factors and motives, while their intensity varies across individual national markets.

Historical review

The concept of organic farming and food industry as a set of approaches and strategies goes through different periods.

Phase 1.0.

The idea of organic farming dates back to the nineteenth century, when the detriment of synthetic fertilizers on human health became evident, and a number of prominent visionaries (physicians, philosophers, agronomists) formulated the principles of organic farming, as a result of this movement in 1972 the IFOAM (International Federation of Movements of Organic Farming) was established.

Phase 2.0.

This phase takes place from 1970 to 2015 and marks the establishment of the first Basic Standards for Organic Production and Processing, adopted by IFOAM in 1980, and the subsequent established standards by the European Commission and the Codex Alimentarius for Marketing and Processing of Organic Production.

Phase 3.0.

The designation of this phase begins in 2016 till now, inspired by the concept of real value and pricing, based on actual costs in the sector (IFOAM & SOAAN, 2016). The aim is to communicate to consumers and political actors and to encourage farmers as full partners. It assumes a dynamic development strategy through increasing best practices such as social responsibility, open pricing, cultural diversification and environmental balance, that are part of the key activities at this stage.

Actuality

In 2017 the organic food market in Bulgaria is estimated at 30-35 million dollars in sales for all sectors and marks almost double increase compared to 2015 (Boshnakova, 2016; 2018, citing Euromonitor). This gives us an opportunity to analyze the variables that led to this sales growth and determine the maturity of the market. To analyze the speed of development, the data will be presented in dynamic lines that express the actual level of the price premium for 2016 and 2018 years. Through arithmetic actions we obtain derived statistical indicators, or the so called descriptive features of development that characterize the main trend of dynamics.

According to Oberholtzer et al. (2005), the analysis of trends in price premiums can provide insight into the relative changes in supply and demand of organic products and a clearer sense of market maturity, and the likelihood of further growth rates. The present analysis does not address in details the factors that make up the higher cost of organic products: i.e. manufacturing (such as higher costs for plant protection, fertilizing, fodder, labor) and non-production (certification, storage, conversion,

[1] In the literature there are two approaches to measuring price premium, in the present study we assume the first one, i.e. comparing the brand price to the average market price.

marketing and so forth). In addition to these prerequisites, smaller volumes and large diversification of small businesses do not allow for "economies of scale" and higher profits. Part of the price differentiation is also due to the higher margin (Lukic, 2011; McLendon, 2010).

In the Bulgarian literature, there hardly be find a systematic price analysis of the dynamics in the price premium of organic food. Due to the heterogeneity of products, there is little research into the magnitude of this price differentiation, which explains the lack of consistent and comparable data.

For calculating the price premium in a number of international studies is applied the product differentiation model (the so-called hedonic model) based on the hedonic hypothesis, that goods are valued for their utility-bearing attributes or characteristics (Rosen, 1974). Each product and service on the market contains a number of features that make together the product marketable for the requested price. The terms „product", „model", „brand", and „design" are used interchangeably to designate commodities of a given quality or specification (Rosen, 1974). For example, a bottle of wine has specific characteristics such as region, wine variety, year of production, color, gas, and so on. This model accepts the following previews:

- The market is perfect - i.e. all quantities sold by the seller meet an adequate demand from the buyer;
- The buyer and the seller make their purchasing decisions led by the drive to maximize their behavior, none of them dominating and the equilibrium prices are the result of this perfect competition.

Studies based theoretically on this hedonic approach (Corsi, 2013; Maguire, 2004; Lusk, 2010) calculate the price premium of organic wine, organic baby food, organic eggs. Because of the many characteristics of the products and the condition of perfect competition, this model in its pure form is not suitable for exploring underdeveloped and not sufficiently stable markets for organic food.

The organic food market in Bulgaria is not perfect, by no means. The user is not in the same position as the merchant. The Bulgarian consumer is not entirely convinced about the quality and origin of the organic production. All of these arguments make the hedonistic model in its pure form impractical for exploring a wider consumer basket. However, in our methodology, we adhere to those principles of the model that are related to consistent tracking of the same product features as trade mark, brand, package, place and time of research, and possibly the same manufacturer.

The reasons for the need of such research are becoming more obvious: organic food penetration into major hyper- and supermarkets, as well as in the HoReCa sector. The development of Internet as a channel for distribution of organic and conventional foods has helped to increase the number of Bulgarian and foreign organic foods sales. These new market infrastructure conditions allow for wider supply and access to organic food, and for more informed consumer choice. Therefore, it is important to collect information on their retail prices, along with conventional food prices, in order to find the actual price premium paid by consumers.

All the commented arguments justify the need to conduct the present study, setting the following goals:

1. To create a methodological framework for measuring the price premium in dynamics and statics as a magnitude, i.e. the difference between the prices of processed organic and conventional foods, for the time period 2016-2018.
2. To determine the development rate indicators – absolute and relative growth, rate of change and growth rate.
3. To assess the maturity of the market i.e. this state of equilibrium characterized by a lack of significant growth and innovation and the establishment of an equilibrium price.
4. To trace the general trend in the change of the pricing premium and the factors that affect it.

By achieving these goals, we hope to contribute to the orientation of all market participants about the level of prices and price differentiation of organic products, and the potential supply and demand opportunities of this new industry.

Methodology

The correct reflection of price changes ensures: comparability of data over time and place; data comparability in terms of value and scale of measurement. The methods applied in the study include: analysis and systematization of quantitative data and primary empirical information about the retail prices of selected organic and conventional foods. The study involves only processed foods, and excludes fresh fruits and vegetables.

The subject of the study is the fluctuation of organic food prices around the average index, adopted as a base (IPP_0). Dynamics is measured with the following variables:

- Consumer prices of conventional processed products, the year 2016 accepted as a base *(Pc_{16});*
- Consumer prices of organic processed products, the year 2016 accepted as a base *(Po_{16})*;
- Consumer prices of conventional processed products through the reported 2018 *(Pc_{18})*;
- Consumer prices of organic processed products through the reported 2018 *(Po_{18})*.

The quantitative data were obtained by a self-provided market sampling study of 12 selected sites, through a typological sample. About 400 prices were collected along the same distribution channels in august 2016 and august 2018, and were summarized. The territorial scope of the survey is the regional market of the city of Plovdiv and partly of the city of Sofia. Four of the hypermarket chains are represented at national level: "Billa", "Lidl", "Kaufland" and "Metro"; 4 are local supermarket chains: („Lexy“, "Triumph", "Sunshine", "Fantastico") and 4 are online specialty stores for sale of organic products ("Balev Bio", "Kashon from Harmonica", "Boutiq foods", "Zelen Bg"). Four of the supermarkets are located in the city of Plovdiv, one of them in Sofia. Of the online stores, three have physical retail outlets in Sofia. Empirical data has been systematized into 12 product categories, as follows:

1. Cereals - flour, spaghetti, macaroni, muesli, oat bran, salted sticks.
2. Canned foods - chutney, ketchup, peeled tomatoes, green beans, pickles, corn, peas and chickpeas jar.
3. Spices - vinegar, sunflower oil, extra virgin olive oil.
4. Chocolate and desserts - chocolate, hip jam; raw desserts - bars, candy and chocolate; sweets, cookies and wafers.
5. Dairy products - 3.6% milk, goat's milk, yogurt 3.6%, airyan, kefir, sheep's cheese, cow's cheese, goat's cheese, cow's yellow cheese, sheep's yellow cheese, cow's butter, sour cream.
6. Drinks - aronia juice, natural juice, rye boza.
7. Eggs - hen eggs.
8. Baby foods - Adapted milk, puree, juice, milk, baby biscuits.
9. Tea and coffee - Mursal tea and Arabica coffee.
10. Wine - red and white wine
11. Honey - honey and sesame tahan.
12. Meat and meat products - pork steak, sausages, tuna.

All collected data are converted from a unit price per unit price to 100 ml for liquids and 100 g for solid foods, to a number for eggs, for the sake of comparability. Thus, the recalculated prices are averaged per product unit and aggregated as average prices per product category. The average prices of organic food for a category are compared with the average prices of conventional analogues, in the same category. Where is possible, the prices of organic and conventional foods by the same producer are compared. The formula from our previous study (Kovacheva & Pancheva, 2016) was applied to calculate the price premium:

*Average price premium category (%) = (Average organic food price category/Average price conventional foods * 100) - 100*

Of the many organic foods available on the market, we chose basic consumer goods that are not subject to special health needs such as non-dairy drinks, gluten-free and vegan foods.

Results and Discussion

For the purpose of the study, the premium levels of organic processed foods were analyzed in 12 sites for a period of one month. The analysis was performed in several analytical sections, the results of which are summarized in 4 tables.

Table 1 compares the prices of organic and conventional foods, categorized in 12 groups. The price premium has been calculated as the average for all categories (120%), the relative figure for 2018. Highest prices were recorded for “Eggs” (293%), followed by "Meat and Meat Products" (262%). These levels are explained by the small number of certified livestock farms and the limited supply of these products.

Table 2 introduces a new pricing premium variable $\boldsymbol{IPP_2=(Po_{18}/Pc_{16}*100)-100}$, which takes as basis the prices of conventional foods in 2016 compared to the prices of organic food in the reporting year 2018. The goal is to get an idea of the typical state of the aggregation through a different model. The average price premium (124%) gives the annual percentage rate of food inflation over the two-year period.

Table 3, based on derived statistical quantities, expresses the aggregate values - the IPP_1 pricing premium (2018) and IPP_0 (2016). We calculate the following dynamics indicators:

- ***Absolute growth ($\Delta i=y_1-y_0$),*** expressing the

actual amount of the price premium for the relevant period, where y_1 is the reporting period, and y_0 is the period accepted for the base 2016 year.

- ***Rate of change*** $(Ti=y_1/y_0)$, where values close to 1 show a slight change.
- ***Rate of growth (%)*** $T_i = y_1-y_0/y_0*100$ - this indicator represents the increase or decrease of the price premium compared to the benchmark adopted for 1.

In the descriptive analysis of the data, it was found that the category "Eggs" (39%) registered the highest absolute decrease, but after a comparison on the base of other indicators, it was found that the category "Children's foods" registered the most significant rate of change in the direction of price reduction (34%) compared to 2016.

In Table 4, we define dynamics indicators by comparing the IPP_2 and IPP_0 adjectives (see Kovacheva & Pancheva, 2016.) This table gives us very important information on an inflationary price increase in the categories of „Milk and milk products" and "Meat and Meat products" alone with positive growth (16%) and (4%). This trend was not revealed in the other tables 1, 2, 3. As can be seen from Tables 3 and 4, the category "Children's foods" marks the highest rate of decline.

In the present survey we have also observed the average prices of basic categories of goods, summarized in the official statistics by the NSI. The latest data are from 2017, which we compare with that in 2015. For these two years, the prices of conventional goods in the „Milk and Milk Products" category showed growth (11% for white cheese, 6% for yellow cheese, to 2% for fresh milk and yoghurt), which is a reason for the lower price difference between conventional and organic food. This is also confirmed by the data in Table 4, where, according to index IPP_2, there is an increase (16%), while according to index IPP_1 in Table 3 shows a decrease (12%).

Another category with significant absolute price growth is "Eggs", according to NSI data, the prices are jumping with 8% over a two-year period. Prices of organic analogues remain unchanged and this is the reason for the lower price premium (293%) in 2018, compared to 2016 (332%). „Meat and Meat products" also show a positive growth rate of 4% (see Table 4). A possible reason is the increase in the price of conventional pork meat (4%), which reflects the price premium. The category "Children's Foods" keeps sustaining its negative growth rate, even at mixed prices. There is almost no supply of conventional dry milk and pulp in the market, and those that are available are considerably more expensive than those two years ago. This is largely the reason for the second lowest place concerning price premium. „Dairy products" have the greatest price differences between different brands of conventional products. The development of the potential of the dairy sector is confirmed by the entry of new Bulgarian producers (Kovacheva, 2018). These data give us grounds that the results obtained from the survey conducted in Bulgaria in august 2018 are correctly received and reflect the global trends in organic food prices.

Conclusions

This study takes into account the following contributions. An original methodology was developed in calculating the price premium dynamics by product category. The aggregation of the data revealed three effects: two net - price premiums for 2018 years (120%), the change in the price premium compared to 2016 with a decrease (10%), and a combined effect of the movement of prices of conventional analogues (4%). This difference is attributed to the Consumer Price Index (CPI) 2016 – 2018, a small basket. So, absolute growth (6%) is on the downside, adjusted by the inflation rate. This gives us reason to define organic food market in Bulgaria as growing, still with opportunities to promote new products and offerers. A balanced price that satisfies the interests of consumers and traders, and that is one of the characteristics of a mature market, is in a process of establishing. This, according to us, places the present organic market in Bulgaria in phase 2.0, according to the IFOAM classification. One of the possible barriers is the insufficient number of participants to influence supply, the non-perfect competition, and many low turnover products.

The lowest priced categories are "Tea and Coffee", "Children's Foods" and "Wine". Best presented as an assortment are the "Chocolate and desserts" and "Cereals" categories. The forecast based on the conducted analysis of the organic food market in Bulgaria, indicates that the prices between organic and conventional foods will slowly converge. The price premium for organic foods is directly related to the prices of conventional analogues, as the same resources are redirected and the results are apparent. It is also necessary in future research to take into

account the price premium between organic and the so-called conventional "plus" products that meet specific needs, such as "reduced pesticide," "no harmful additives," etc.

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NSI National Statistical Institute, http://www.nsi.bg/bg/content/3269/hranitelnistoki,;http://www.nsi.bg/bg/content/2539/калкулатор-на-инфлацията

Table 1. Price premium by categories of foods (in relative share)

№	Food categories	Po_{18} Organic price (BGN) for 100 gr /100 ml	Pc_{18} Conventional price (BGN) for 100 gr /100 ml	IPP_1 (%) Price premium
a)	Cereals	1,20	0,53	126
b)	Canned foods	1,19	0,47	153
c)	Spices	1,59	0,75	112
d)	Chocolate and desserts	4,52	2,36	92
e)	Milk and milk products	1,80	1,09	65
f)	Drinks	0,97	0,39	149
g)	Eggs	0,59	0,15	293
h)	Baby foods	2,71	2,01	35
i)	Tea and coffee	11,45	9,39	22
j)	Wine	1,17	0,79	48
k)	Honey	2,62	1,48	77
l)	Meat and meat products	6,95	1,92	262
	Average			**120 ***

*** IPP reduced pricing premium organic foods % = avg. (IPP_a+ IPP_b + IPP_c+…. IPP_l)%**

***IPP_1=(Po_{18}/Pc_{18} *100) - 100**

Table 2. Price premium by categories of foods compared to base prices 2016 year (in relative share)

№	Food categories	Po_{18} Organic price (BGN) for 100 gr /100 ml	Pc_{16} Conventional price (BGN) for 100 gr /100 ml	IPP_2 (%) Price premium
a)	Cereals	1,20	0,53	126
b)	Canned foods	1,19	0,48	148
c)	Spices	1,59	0,76	109
d)	Chocolate and desserts	4,52	2,36	92
e)	Milk and milk products	1,80	0,97	86
f)	Drinks	0,97	0,39	149
g)	Eggs	0,59	0,14	321
h)	Baby foods	2,71	1,97	38
i)	Tea and coffee	11,45	9,49	21
j)	Wine	1,17	0,80	46
k)	Honey	2,62	1,53	71
l)	Meat and meat products	6,95	1,80	286
	Average			**124 ****

****IPP_2= (Po_{18}/Pc_{16} *100)-100 additional variable**

Table 3. Dynamics indicators at variable IPP_1

Food categories	IPP_1 % (y_1) current year 2018	IPP_0 % (y_0) base year 2016	Absolute growth $\Delta i = y_1 - y_0$	Rate of change $Ti = y_1/y_0$	Rate of change (%) $Ti` = y_1-y_0/y_0 *100$
Cereals	126	141	-15	0,89	-11
Canned foods	152	158	-6	0,96	-4
Spices	113	118	-5	0,96	-4
Chocolate and desserts	92	95	-3	0,97	-3
Milk and milk products	65	74	-9	0,88	-12
Drinks	148	151	-3	0,98	-2
Eggs	293	332	-39	0,88	-12
Baby foods	35	53	-18	0,66	-34
Tea and coffee	22	28	-6	0,79	-21
Wine	49	50	-1	0,98	-2
Honey	75	82	-7	0,91	-9
Meat and meat products	261	274	-12	0,95	-5
Average	120	130	-10	0,92	

Table 4. Dynamic indicators at additional variable IPP2

Food categories	IPP_2% (y_1) current year 2018	IPP_0 % (y_0) base year 2016	Absolute growth $\Delta i = y_1 - y_0$	Rate of change $Ti = y_1/y_0$	Rate of change (%) $Ti` = y_1-y_0/y_0 *100$
Cereals	126	141	-15	0,90	-11
Canned foods	148	158	-10	0,94	-6
Spices	109	118	-9	0,92	-8
Chocolate and desserts	92	95	-3	0,97	-3
Milk and milk products	86	74	12	1,16	16
Drinks	149	151	-2	0,99	-1
Eggs	321	332	-11	0,97	-3
Baby foods	38	53	-15	0,72	-28
Tea and coffee	21	28	-7	0,75	-25
Wine	46	50	-4	0,92	-7
Honey	71	82	-11	0,87	-13
Meat and meat products	286	274	12	1,04	4
Average	124	130	-6	0,95	