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CONTRIBUTION OF FOOD PRODUCTION SECTOR TO THE INCREASE OF EMPLOYMENT – COMPARATIVE ANALYSIS OF SLOVENIA, CROATIA, AND SERBIA[2]

Abstract

The processing sector in Serbia has not managed to consolidate even after more than a quarter century since the breakup of the former Yugoslavia. Food production in Serbia shares the fate of the entire production sector, as its integral part. Despite this fact, food production is more and more seen as the opportunity for increasing employment and the level of economic activity in Serbia. Especially after the introduction of EU sanctions by Russia, advocates of export of food products as the development opportunities for Serbia are growing louder. This made us pose the research question relating to whether economic growth in the area of food production has effects on employment level in Serbia? In searching for the answer to this question, we constructed a sample of the 20 largest food producers in Serbia and investigated the correlation between the level of economic activity in these companies and the number of their employees. We did the same for the 20 largest manufacturers in Slovenia and Croatia, and tested the hypothesis about the food production as the development opportunity.

Key words: the food production sector, employment, economic activity and the regression model.

JEL Classification: J23, E24

ДОПРИНОС СЕКТОРА ПРОИЗВОДЊЕ ПРЕХРАМБЕНИХ ПРОИЗВОДА ПОВЕЋАЊУ ЗАПОСЛЕНОСТИ – КОМПАРАТИВНА АНАЛИЗА СЛОВЕНИЈЕ ХРВАТСКЕ И СРБИЈЕ[3]

Апстракт

Прерађивачки сектор у Србији и након више од четврт века од распада бивше СФРЈ није успео да се консолидује. Производња прехрамбених производа у Србији дели судбину читавог прерађивачког сектора, као њен саставни део. Упркос овој чињеници у последње време се све више говори о

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производњи прехрамбених производа, као шанси за повећање запослености и нивоа економске активности у Србији. Нарочито након увођења санкција ЕУ од стране Русије, заговорници извоза прехрамбених производа, као развојне шансе за Србију су све гласнији. Ово је утицало да поставимо истраживачко питање да ли раст економске активности у области производње прехрамбених производа има ефекте на ниво запослености у Србији? У тражењу одговора на ово питање конструисали смо узорак од 20 највећих произвођача прехрамбених производа у Србији и пратили везу између нивоа економске активности у тим предузећима и броју ангажованих радника. То исто смо учинили и за 20 највећих произвођача у Словенији и Хрватској и тестирали хипотезу о производњи прехрамбених производа као развојној шанси.

***Keywords**: сектор производње прехрамбених производа, запосленост, економска активност и регресиони модел.*

Introduction

Food industry, with a large number of activities that make it, employs a significant part of labour, while at the same time playing the role of the multiplier of employment at the national level. In fact, it encourages the development of agriculture and other industries that precede it in the production cycle, and enables the development of underdeveloped rural and urban areas – through the establishment of small and medium enterprises. In this context, we the opportunity for the development of the local economy through the development of the food industry is recognised. Accordingly, we defined the hypothesis on the basis of which the growth of economic activity in the sector of food production, measured by the level of operating revenue, may affect the growth of the number of employees engaged in this sector. The starting premise is that a greater scope of food production activities can increase the level of employment. In seeking answers to the research question, we made three samples. The first consists of the 20 largest food producers in Slovenia. The second consists of the 20 largest food producers in Croatia, whereas the third includes 20 largest food producers in Serbia. Based on the defined samples, we conducted research of the correlation between the scope of business activities and number of employees engaged.

The structure of the work has been adapted to the defined research subject and the hypotheses. The content of the first part involves the theoretical background related to the place and role of food production in the processing sector and the economy as a whole. The second part presents the methods and results of research. Finally, some concluding remarks are presented.

1. Theoretical background

Literature knows various ways of defining food processing activities. Many traditional definitions emphasise the link between food processing and food preservation, and this dimension is one of the most important reasons for food processing. Back in 1966, Lodge and Jones defined the food industry as a set of production, distribution, and marketing activities related to food production (Lodge G. & Jones C. 1966). One

of the basic definitions identifies this phenomenon as the conversion of raw materials or ingredients into a food product. A more complete, however, is the definition given by Connor, which includes initial and final stage of food processing, as well as inputs used. According to him, "the commercial food industry" is the branch of production which starts with animal, vegetable, or marine raw materials, and then transforms them into food or edible products by using labour, machinery, energy, and scientific knowledge (Heldman D. & Hartel R, 1999). According to Wilkinson, the food industry can be viewed as a set of activities that are performed after the harvest and that add value to agricultural products prior to marketing. In addition to the primary processing of food raw materials, food industry includes the final food production, preparation, and packaging of fresh products (McCullough E.B. et al. 2008).

The food industry does not include one sector which produces series of mainly similar products. On the contrary, it is the industry that is broad and diverse, both in terms of its structure and in terms of products produced. The basic characteristics of the food industry are:

1. A large number of small and medium enterprises operating in a highly competitive environment,
2. Rapid changes of production lines,
3. Low profit margins,
4. High use of physical work in often unattractive environment,
5. Lack of understanding of automation (Caldwell D. et al. 2009).

One of the common characteristics of the food industry of almost every country is diversified nature of the sector, with a high share of small and medium enterprises. According to the research conducted by the Food Industry Association of the European Union and the United Nations Environment Programme, in 1992, at the level of the European Union, as much as 92.4% of companies in the food industry were small and medium enterprises. On the other hand, larger companies with over 100 employees accounted for 70% of the turnover of the sector. However, at the beginning of the third millennium, we see a growing trend of association of companies within the food industry, as well as the trend of steady growth in the number of large companies in this sector in many countries (the EU and the UN Environmental Programme, 2002).

The food industry is one of the most important branches of most of the member states of the European Union, and, as such, plays a central role in the processing of agricultural raw materials and food supplies. This branch of the processing industry is traditionally viewed as a sector with low intensity of research. However, innovation and research in the food industry should be encouraged because they are of immeasurable importance for companies belonging to this industry, which can use them to stand out from the competition and meet consumer expectations. The introduction of functional and organic food in this sense is gaining in importance, the increased demand for which being the result of high health care costs (Bigliardi B. & Galati F. 2013).

Ettlie sees the space for the development of the food industry in the fact that the food arouses attention at the national and international level as a constant problem and the key precondition of quality life (Ettlie J. 1983). In this regard, the food industry is a highly promising branch of processing industry, which, with the help of intensive investment, can be a pillar of economic development and a source of increasing employment. Rekha and Poonam point to the importance of the food industry for overall economic development, while noting that this sector represents a link between industry and agriculture. Food industry contributes to the diversification and commercialisation of farming, increase of farmers' income, creation of a market for export of agricultural food, as well as creation

of more job opportunities (Rekha K. & Poonam K. 2011). The importance of processing industry and food production, as well as their impact on employment, has been the area of interest of economists for a number of decades. The food industry is one of the biggest employers worldwide. For example, in Australia, the food industry employs one out of five employees in the sector of production activities. The food industry has a multiplier effect on employment. It is estimated that each job in the European sector of soft drinks generates additional ten jobs (including suppliers, retailers, and others). A similar effect is present in the food industry (EU and UN Environmental Programme 2002).

Most authors find that food processing companies are usually the main source of employment in rural economies. The fact is that many activities that involve food processing are carried out in the villages, which significantly contributes to employment of the rural population. In a survey conducted in 1987, which focused on the production of soybean and soybean products, a group of authors (Hayami, Kawagoe, Marooka, Siregar), pointed to a great importance of processing of agricultural products for income generation in local communities. This study also recognised the importance of these activities for the equalisation of income distribution, through increasing employment and the share of income that belongs to work. Based on the research, the authors also recognised the impact of the processing industry on the economy as a whole. Specifically, these activities can be used as a tool to alleviate poverty and inequality in rural areas, especially in developing countries (Hayami, Y. et al., 1988). However, some research (McCullough, Pingali, Stamoulis) indicate that the food industry is also a key component of production and employment even in the most developed countries, with important opportunities for employment and business start in the sector of small and medium enterprises. However, employment in this sector in recent years shows a declining trend, as a consequence of efforts to increase productivity, rather than offshoring practices (McCullough E.B. et al. 2008).

The importance of the food industry as a source of employment can be understood if we consider its impact on the development of other sectors of the economy. Numerous studies indicate considerable contribution of the food industry to the growth in many other sectors, especially agriculture. For example, in the European Union, the food industry sector is a customer of over 70% of the agricultural products from the European Union markets. Furthermore, in Canada, 40% of agricultural production is exported in raw form, 15% is either sold directly to consumers or sold for non-food purposes, and 45% is sold as processed food within the food industry. On the other hand, the food industry emerges as the important energy user, and as a major purchaser of equipment, technologies, and new products. This sector is also a major customer of the packaging industry and transport services, and it invests in transport infrastructure, networks, and vehicles. At the end of the supply chain, the food industry is one of the largest users of advertisements and advertising, and plays a key role in supplying the retail sector. World trade in the field of agri-food products is steadily increasing. In this regard, the share of processed food in the trade of agri-food products is also growing (EU and UN Environmental Programme 2002). In this way, the food industry is the driver of employment in a number of sectors and industries.

Some authors (Caldewell, Davis, Massey, Gray) believe that in the years to come, the number of people willing to work in the field of food industry for the current wage level will decline, so that this sector will have to change in order to survive. In fact, except for a few multinational companies, companies in the food industry are characterised by a low level of research and development activities, insufficient capacity utilisation and maintenance of advanced automatic equipment, as well as underdeveloped information technology. Faced with these problems, the food industry has identified the introduction

of automation as a crucial goal, with the purpose of improving production efficiency, reducing losses at all levels, improving hygiene standards, improving the consistency of product quality, improving working conditions in order to retain high-quality staff (Caldwell D. et al 2009). These means that innovation capacity of food production is also important as well as for other business sector (Cvetanovic et al.).

One of the key problems of the food industry is the low overall level of high-growth entrepreneurship, which indicates weak dynamic capabilities of companies within this industry. Policy makers can promote training in the field of management in companies within the food industry which record poor performance, particularly in family companies, which often have relatively closed methods of recruitment for senior management positions. Furthermore, it would be reasonable if the current agricultural producers and food processing companies undertook more value-added activities, to avoid competition based solely on price. To ensure this, a number of food processing companies must achieve higher level of innovativeness. Bearing in mind the importance of engaging the end user as a source of innovation, policy makers should encourage closer relationship between the companies and major end users, such as supermarkets, which play a key role in organising the food industry. Similarly, farmers should encourage the development of closer relations between them and food and beverage processing companies (Alsos, G.A. et al. 2011).

We see that most of the presented literature sources indicate unsuspected importance of the processing and food industry for encouraging employment and the overall economic development.

2. Research method and results obtained

In order to search for answers to the posed research question, i.e. whether the increase in economic activities in the food production can contribute to employment growth, we will use a simple regression model. For this purpose, we selected 20 largest food producers in the three countries, Slovenia, Croatia, and Serbia. The criterion for the selection of the largest companies was net operating revenue in one calendar year. In order to ensure availability and comparability of data, 2012 was taken as the calendar year for observation. Based on the available data (Tables 1, 3, and 5), we constructed a regression model of functional dependency between operating revenue and the number of employees engaged in each country. The first analysed country was Slovenia.

Table 1. Operating revenue in thousands of euros and the number of employees in the 20 largest food producers in Slovenia

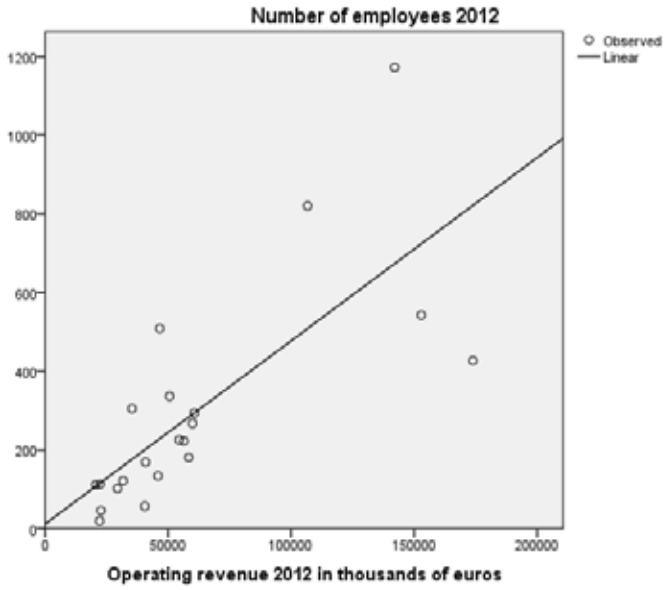
No.	Company	Operating revenue in thousands of euros in 2012	Number of employees in 2012
1	Droga Kolinska	173.873	427
2	Ljubljanske mlekarne	152.880	543
3	Perutnina Ptuj	142.062	1.172
4	Žito	106.694	820
5	Mlekarna Celeia	58.386	181
6	Fructal	50.599	337

7	Jata Emona	54.490	226
8	Panvita	56.384	223
9	Celjske mesnine	59.908	268
10	Mlinotest živilska	46.568	509
11	Kras	45.864	134
12	Pomurske mlekarne	40.820	169
13	PIVKA	35.328	305
14	Panvita Kmetijstvo	40.524	57
15	Tovarna Olja	29.434	102
16	Meso Kamnik	31.717	122
17	Kras Meso	22.155	20
18	Mesnine dežele kranjske	22.688	46
19	INCOM	20.578	112
20	Mercator-emba	22.349	113

Source: Official financial statements for 2012

Based on the available data, we constructed a simple regression model for Slovenian food producers (Figure 1). The elements of the model are shown in Table 2.

Figure 1. Dispersion diagram of operating revenue in thousands of euros and the number of employees in the 20 largest Slovenian food producers



Source: Authors, on the basis of Table 1

Table 2. Model Summary and Parameter Estimates

Dependent Variable: Number of employees 2012

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	,553	23,469	1	19	,000	11,878	,005

The independent variable is Operating revenue 2012 in thousands of euros.

Table 2 points to the conclusion that in the case of food producers in Slovenia, the regression model is: $y=5*10^{-6}x+11,878$, where y is the number of engaged employees, while x is the operating revenue in euros in the observed year. What we also conclude is the fact that this regression model is applicable in 55.3% of cases, i.e. the coefficient of determination is 0.553 with a significance level of less than 0.05. The correlation coefficient between the operating revenue and number of employees is 0.743. Therefore, it is certain that in the case of Slovenian food producers, there is a statistically significant relationship between the growth in operating revenue and an increase in the number of engaged employees.

The next economy in the focus of our analysis was the Republic of Croatia. The results of the observation of the Croatian economy are shown in Table 3.

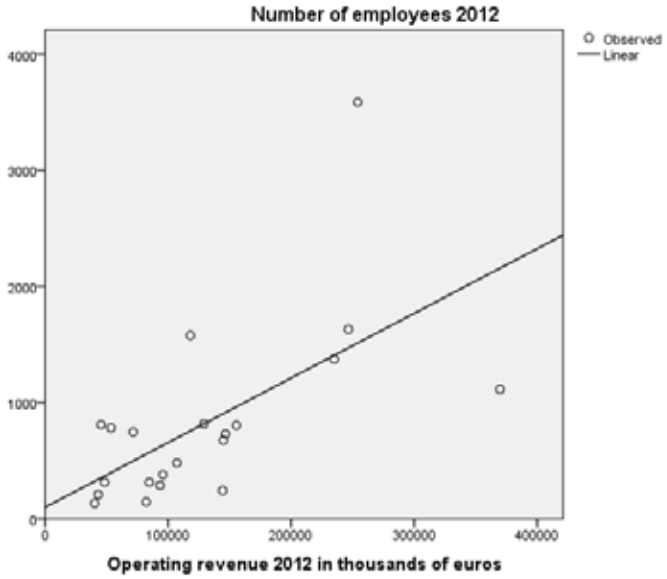
Table 3. Operating revenue in thousands of euros and the number of employees in the 20 largest food producers in Croatia

No.	Company	Operating revenue 2012 in thousands of euros	Number of employees 2012
1	Vinidija	369.771	1.116
2	Podravka	254.138	3.587
3	Dukat	235.033	1.375
4	PIK Vrbovec	246.495	1.633
5	Ledo	155.489	806
6	Zvijezda	144.892	675
7	MI Braća Pivac	146.640	731
8	Kraš	118.110	1.580
9	Viro tvor. Šećera	144.341	245
10	Franck	107.156	481
11	Sladorana	84.695	315
12	Gavrilović	71.614	747
13	P.P.K.	95.694	382
14	Granolio	82.179	145
15	Tvornica šeć. Osjek	93.467	289
16	Danica	53.597	783
17	Cedevita	48.384	315
18	Meggle Hr	43.164	210
19	Perutnina	45.508	811
20	KIM	40.311	134

Source: Official financial statements for 2012

Based on the available data, we constructed a simple regression model for Croatian food producers (Figure 2).

Figure 2. Dispersion diagram of operating revenue in thousands of euros and the number of employees in the 20 largest Croatian food producers



Source: Authors, on the basis of Table 3

The elements of the model, in accordance with the needs of Croatian food producers are shown in Table 4.

Table 4. Model Summary and Parameter Estimates

Dependent Variable: Number of employees 2012

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	,373	11,287	1	19	,003	99,747	,006

The independent variable is Operating revenue 2012 in thousands of euros.

Table 4 points to a conclusion that in the case of food producers in Croatia, the regression model is: $y=6*10^{-6}x+99,747$, where y is the number of engaged employees, while x is the operating revenue in euros in the observed year. What we also conclude is the fact that this regression model is applicable in 37.3% of cases, i.e. the coefficient of determination is 0.373 with a significance level of less than 0.05. The correlation coefficient between operating revenue and number of employees is 0.610. Therefore, it is certain that in the case of Croatian food producers, there is a statistically significant relationship between the growth in operating revenue and an increase in the number of employees engaged.

The last but not least in the focus of our analysis was the situation in food production in Serbia. The results of the observation of the Serbian economy are shown in Table 5.

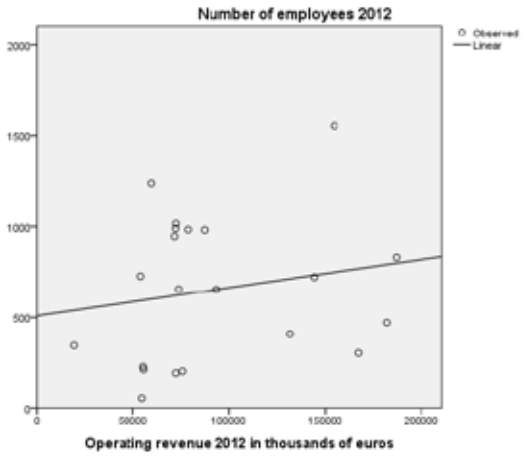
Table 5. Operating revenue in thousands of euros and the number of employees in the 20 largest food producers in Serbia

No.	Company	Operating revenue 2012 in thousands of euros	Number of employees 2012
1	Sunoko	182.108	471
2	Imlek	187.107	828
3	Victoriaoil	167.255	304
4	Dijamant	144.336	720
5	Matijevic	154.664	1.553
6	Sojaprotein	131.444	408
7	Grand prom	75.831	204
8	TE-TO	72.491	194
9	Frikom	87.185	981
10	Koncern Bambi	72.351	990
11	Nectar	73.913	654
12	Crvenka	55.581	214
13	Soko Štark	71.811	946
14	Marbo product	78.727	983
15	Swisslion	72.518	1.016
16	Carnex	59.524	1.238
17	Gebi	55.317	229
18	Konzul	54.673	53
19	Neoplanta	53.972	725
20	Nestle Adriatic	19.302	345

Source: Official financial statements for 2012

Based on the available data, we constructed a simple regression model for Serbian food producers (Figure 3).

Figure 3. Dispersion diagram of operating revenue in thousands of euros and the number of employees in the 20 largest Serbian food producers



Source: Authors, on the basis of Table 3

The elements of the model, in accordance with the needs of Serbian food producers are shown in Table 6.

Table 6. Model Summary and Parameter Estimates

Dependent Variable: Number of employees 2012

Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	,033	,657	1	19	,428	509,127	,002

The independent variable is Operating revenue 2012 in thousands of euros.

Table 6 points to a conclusion that in the case of food producers in Serbia, the regression model is: $y=2*10^{-6}x+509,127$, where y is the number of engaged employees, while x is the operating revenue in euros in the observed year. What we also conclude is the fact that this regression model is applicable in 3.3% of cases, i.e. the coefficient of determination is 0.033 with a significance level of less than 0.05. The correlation coefficient between operating revenue and number of employees is 0.183. Therefore, it is certain that in the case of Serbian food producers, there is no statistically significant relationship between the growth in operating revenue and an increase in the number of employees engaged.

3. Conclusion

On the basis of the research, we can conclude that the growth of economic activity in the sector of food production has different effects on the level of employment in Slovenia, Croatia, and Serbia. In the case of Slovenia and Croatia, we can conclude that the increase in operating revenue in companies engaged in the food production has an impact on increasing the number of hired workers, and hence employment. Unfortunately, in the case of Serbia, it can be seen that there is no correlation between operating revenue and the number of employees in the food production sector. Additionally constructed regression models that would link the two phenomena would be applicable only in 3% of cases in the analysed sample. In other words, in the sample of the largest food producers, there is not a single company in which the relationship between the level of economic activity and the number of workers engaged could be modelled. The obtained results have opened numerous other research questions related to the dilemma of whether food production is really Serbian development opportunity or just a marketing gimmick of political elite.

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