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The impact of employment in agriculture on overall employment and development: a case study of the district of Topoľčany, Slovakia

Abstract

Agricultural co-operatives belonged among the most significant employers in the agricultural sector of Slovakia in the period before 1989. In addition to their production function, they played a very important social and demographic function, especially in rural areas, helping to stop or, at least, to slow the trend of the depopulation of these areas, as well as delivering significant support to employment policy. The number of agricultural co-operatives has been continuously decreasing, but they still provide, in comparison to other businesses in the agricultural sector, most of the job opportunities. The aim of this article is to assess the extent to which a particular co-operative employs the inhabitants of a region and whether there is a link between the development of employment in that region and the co-operative that operates there. For practical research, the particular region of Nitra county has been chosen, as it is a significant agricultural area and since the decrease of the workforce in agriculture has a negative impact on the economic and social situation of the wider region.

Keywords: *agriculture industry, productivity, co-operatives, employment, wages, local labour force*

Background

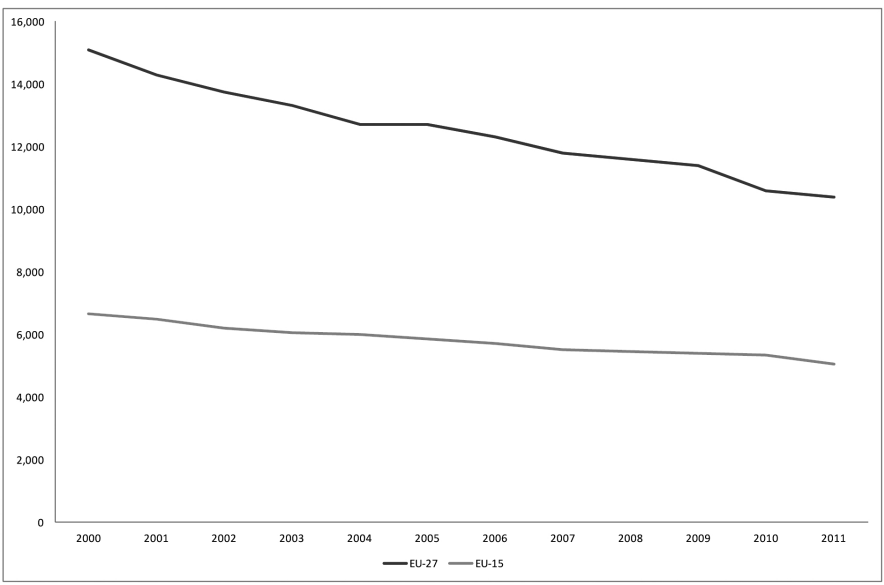
Traditionally, the agricultural sector has been an important source of employment in rural regions (Pavelka, 2010). However, agricultural employment has declined rapidly during the last few decades and there is evidence that the number of jobs in agriculture in the EU is about to halve over the next twenty years. The reduction of agricultural employment has major consequences for the employment situation of rural regions – especially when the share of agriculture in total employment is high – unless sufficient alternative jobs can be provided (Terluin and Post, 2000).

In 2009, agriculture in the EU-27 generated around €130.6bn of value added, representing around 1.2 % of added value for the whole economy. The economic importance of agriculture was, in value added terms, generally much greater in the east and south of Europe than in its west and north. Agriculture's contribution to the whole economy was above 3.5 % in 36 out of the 241 regions in the EU (Eurostat regional yearbook, 2012).

In total, agricultural labour input in the EU was 11 million annual work units (AWU)[1] in 2010. Slightly less than half of the labour input was in the EU-15, where about 85 % of the gross value added is generated. Consequently, the relationship between gross value added and labour input is very different in the new member states. Over the period between 2000 and 2010, agricultural labour input fell by 26.0 % in the EU-27 (EU, 2011).

Figure 1 shows the development of employment in the agricultural sector in the 2000-2010 period. At that time, the number of agricultural employees decreased by almost 5 million (in terms of AWU). A significantly greater decrease was, however, observed in the new EU member countries, including Slovakia (Figure 2).

Figure 1 – Development of labour input in EU agriculture, 2000-2010



Source: Eurostat; authors' own processing

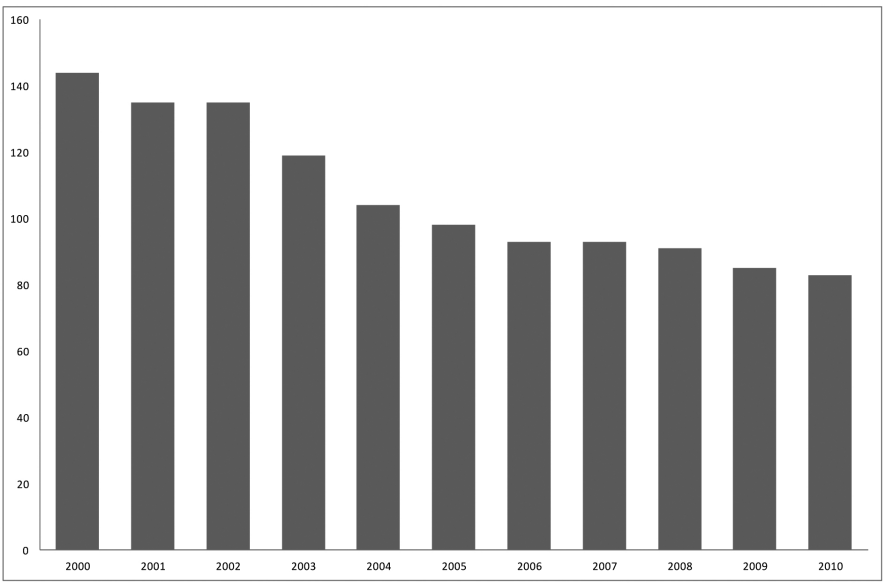
Total employment in Slovak agriculture could, as a result of the process of the transformation of the industry, be considered to have rapidly declined. During the period between 1989 and 2005, total agricultural employment declined by nearly 90 %. The situation has also deteriorated as a consequence of an increase in the average age of employees due to the lack of interest of young people towards working in the agriculture sector (Schwarczová, 2007). Mura (2012) pays attention to the human resources development aspects of this situation, too.

According to (Koncoš, 2006), labour productivity expressed in terms of the number of workers per 100 hectares of agricultural land did, in the period between 1990 and

1 The work performed by one person employed full-time on an agricultural holding.

2005, change significantly. In 1990, 14.74 workers were required to cultivate an area of that size; in 2005, only 4.22 workers were required per 100 ha of agricultural land. Or, *vice versa,* in 1990 one worker cultivated just 6.78 hectares of agricultural land while in 2005 the figure had risen to 23.67 hectares. Such an increase in labour productivity is related to the technological renewal of agriculture and the introduction of efficient technologies for cultivation and for industrialising some sectors in livestock production. Kocmanová *et al*. (2011) have researched quantification and development modelling.

Figure 2 – Development of labour input in Slovakian agriculture, 2000-2010 (AWU, 000)



Source: Eurostat; authors' own processing

The most significant employer in the agricultural sector in the period before 1989 was agricultural co-operatives. The number of agricultural co-operatives has been continuously decreasing, but they still provide, in comparison to other businesses in the agricultural sector, most of the job opportunities. The share of particular legal forms of entrepreneurship in the overall pattern of employment in agriculture follows the general trend of the development of agricultural enterprises, but this trend is slower and agricultural co-operatives remain the most important long-term source of jobs in the agricultural sector. In 1989, agricultural co-operatives employed about 80 % of all agricultural workers; this rate decreased to 65.4 % in 2010. Furthermore, in terms of average monthly wages, there are no extremely large differences but they are almost always slightly higher in agricultural co-operatives than in other business companies.

From the point of view that the average age of employees in co-operatives is over fifty, these organisations are considered to have a social role because this group of people has only limited possibilities to find a job on the labour market. Nowadays, there are almost no young people (up to 25 years old) employed in the co-operatives, so there is a potential role for co-operatives in terms of the employment of long-term unemployed young people. Čadil *et al*. (2011) deal at greater length with the costs of unemployment. The other social aspect to the co-operatives is represented by the employment of people with disabilities.

The co-operatives mainly employ residents of the region in which they farm. Analysis has proved a strong relationship between the co-operative and the region in which it is situated and its role in maintaining employment within the region. However, the question of employing residents where the co-operative is situated relates to the degree of availability of alternative non-agricultural jobs. Accordingly, it can be concluded that agricultural co-operatives play, in addition to their production function, a very important social and demographic role, especially in rural areas, helping to stop, or at least to slow, the trend of de-population of these areas as well as delivering significant support for employment policy (Lazíková and Bandlerová, 2006).

The aim of this article is to assess the extent to which a particular co-operative employs the inhabitants of that region and whether there is link between the development of employment in the selected region and the co-operative that operates in that area. For this research, we have chosen the particular region of the county of Nitra, as it is significant agricultural area and the decrease in the agricultural workforce has a negative impact on the economic and social situation of the region.

Nitra region

Nitra region has an area of 6 343 km², representing 12.9 % of the area of the Slovak Republic. 350 municipalities are located within the region, of which 15 have city charters while there are seven districts: Komárno; Levice; Nové Zámky; Šaľa; Nitra; Topoľčany; and Zlaté Moravce. Approximately 48.5 % of the population lives in the city of Nitra.

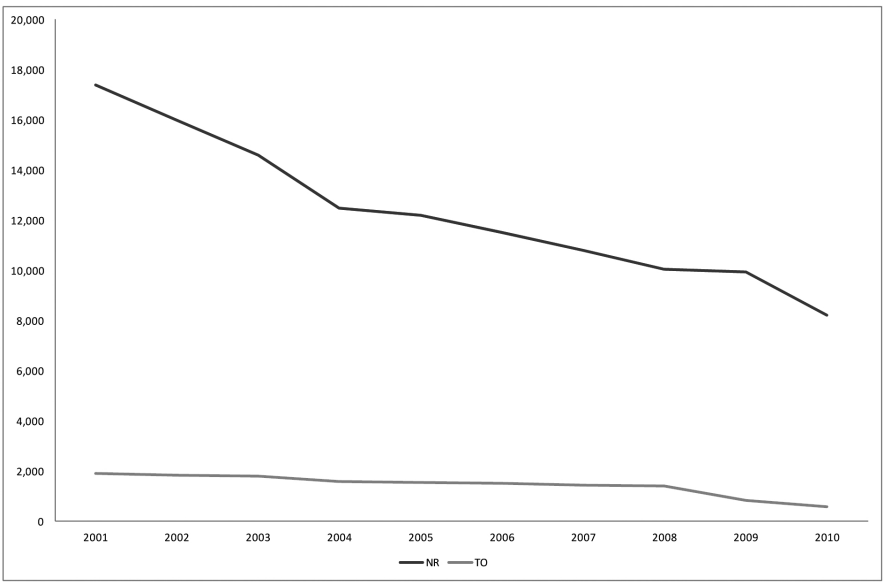
Figure 3 – Map of Nitra region

Source: Self-government of Nitra region

The region's relief predominately consists of plains and lowlands, broken by mountainous areas. It is one of the warmest and agriculturally most productive centres of the Slovak Republic. The Tríbeč mountains stretch along the north, while the north-east is bordered by the Štiavnický Ridge and part of the Pohronský Inovec. The high-quality farmland of the Danube Lowland (Podunajská nížina) constitutes the largest part of the southern and south-eastern part of the region. This area includes Rye Island (Žitný ostrov), the largest river island in Europe, comprising the land between the main channel of the Danube River and the Little Danube (Malý Dunaj) tributary, and richly endowed with an underground water supply.

There are 641 companies operating in the agricultural industry of the Nitra region. The number of these companies represents 12.69 % of the total number of enterprises operating in the agricultural sector in Slovakia. The total number of self-employed people in agriculture in the Slovak Republic is 12 937. Out of this number, 971 operate in the county of Nitra, which represents 7.5 % of all self-employed farmers in Slovakia. The district of Topoľčany is the fourth highest, with a share of 13.8 %. Self-employed farmers in the Nitra region are found most commonly in the district of Nové Zámky (22.97 %), and least of all in Šaľa (7 %).

Figure 4 – Development of employee numbers in Nitra county and the district of Topol'čany, 2001-2010



Source: Statistical Office of Slovak Republic; authors' own processing

Figure 4 identifies clearly that the development of employment in agriculture has been declining at the county level (i.e. Nitra as a whole), as well as at the level of the district (i.e. Topoľčany). Between 2001 and 2010, the number of jobs in the agricultural sector within the county reduced by some 8 969 jobs; at the end of 2010, just 48.03 % of the 2001 workforce worked in the agricultural sector. Comparing the figures at the district level, we can state that 577 employees work in the agricultural sector in Topoľčany, representing just 32.27 % of the total number of employees there had been in 2001.

Table 1 – Average wage in agricultural sector (€), 2006-2010

Year	Slovakia	Nitra county	District Topoľčany
2006	514.64	504.48	573.89
2007	569.62	560.64	667.02
2008	621.60	626.18	747.70
2009	587.26	586.83	631.14
2010	608.00	588.00	697.00

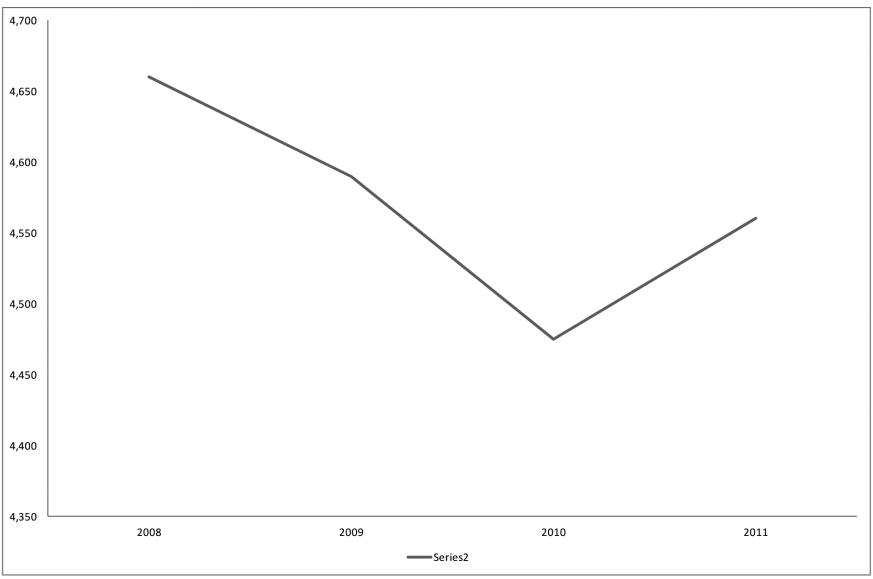
Source: Statistical Office of Slovak Republic, authors' own processing

According to Table 1, the average wage in the agricultural sector in the district of Topoľčany is habitually higher than both the Slovak average and the average for the county of Nitra.

Case study

The co-operative which is being analysed is located in the northern part of the Nitra region. The company currently operates on an area of 4 558 ha across sixteen villages. The trends in the amount of agricultural land under cultivation is highlighted in Figure 5.

Figure 5 – Trends in agricultural land area within the co-operative (in hectares)



Source: authors' own data

The co-operative employs 129 employees on permanent contracts. Within the context of rationalisation and making work operations more effective, as well as in terms of increasing the value added per employee, the co-operative has reduced the number of employees by 67 since 2001. The trend in this area is demonstrated in Table 2.

Table 2 – Number of employees in the co-operative

Year	Number
2001	196
2008	149
2009	134
2010	131
2011	129

Source: authors' own data

In the last three-year period (i.e. 2009-2011), it can be seen that the trend in the number of employees has stabilised at an average of 131 employees. The co-operative employs staff from seventeen villages.

Results of the statistical survey

On the basis of data obtained from primary research, we undertook quantitative analysis using the possibilities of two-dimensional inductive statistics, to which we applied correlation analysis while focusing on quantifying the intensity of the statistical dependence between two quantitative variables. Regression analysis assumes that variable Y is random and variable X is fixed. The term correlation coefficient mostly means the Pearson correlation coefficient (Pearson's product moment), representing the volume of the linear dependence between two variables. Pearson's correlation coefficient ρ (*rho*), estimated from a random sample, is written r and calculated as follows:

$$r = \frac{\overline{xy} - \overline{x}\,\overline{y}}{s_x s_y}$$

Pearson's correlation coefficient is equal to -1 in the case that all observations lie on a straight downwards line and +1 if the observations lie on a straight upwards line. The interpretation of the correlation coefficient depends on the context. Cohen (1988) developed a simple tool for the interpretation of correlation coefficients: a correlation figure (in absolute value) below 0.1 is trivial; 0.1 to 0.3 is small; 0.3 to 0.5 is medium; and above 0.5 is strong.

Analysis is realised by the use of Pearson's correlation coefficients which, in our research, represent the relationship between the proportion of employees in the village and its unemployment rate as measured by the share of the number of job seekers in the village.

Table 3 – Quantitative analysis

Name of village	Correlation coefficient	Correlation	*p*-value
Jacovce	-0.048860393	trivial	0.857393
Prašice	-0.594894417	strong	0.015066
V. Bedzany	0.099123885	trivial	0.714937
M. Bedzany	0.050034149	trivial	0.854001
Topoľčany	-0.136084267	small	0.615295
Tesáre	0.060129369	trivial	0.824932
Krušovce	-0.297595648	small	0.26296
Solčany	-0.258071287	small	0.334529
Závada	-0.07173465	trivial	0.791778
Nemčice	0.016977571	trivial	0.95024
Nemečky	-0.162972927	small	0.546465
Rajčany	0.01210008	trivial	0.964525
Chrabrany	-0.197106836	small	0.464353
Podhradie	-0.160156284	small	0.553513
Velušovce	-0.517939302	strong	0.03987
Krnča	-0.147553891	small	0.585521
Tvrdomestice	-0.56168	strong	0.023563

Source: SAS software of author's own data

Based on these correlation coefficients, we can conclude that the development of employment in particular villages does depend on the proportion of employees in the municipality working in the co-operative. These are: Prašice, Tvrdomestice and Velušovce where, through *p*-values, an existing linear relationship between the selected variables may be verified. In some municipalities, the correlation coefficient was between 0.15 and 0.3, but the *p*-value was not below 0.05 so, in these cases we cannot generally prove the existence of a dependency. In villages where the correlation coefficient has not reached a value higher than 0.1, it is not possible even to think about the existence of such dependence so, in these villages, a change in employment in the co-operative does not influence a change in employment in the village and, therefore, the co-operative is not such an important unit of employment in the village.

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