

# Impact of agricultural sector on the economic situation of NUTS III regions in the Czech Republic

## *Vliv zemědělství na hospodářskou situaci regionů NUTS III v České republice*

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**Abstract:** In all developed economies of the world there was, in the past, a significant decrease in the share of agriculture with regard to the Gross Domestic Product (GDP) and employment. However, it is still possible to find considerable differences between individual countries as well as between regions. The income of agricultural workers is traditionally lower, which subsequently leads to an outflow of population from the country into cities, and to further deterioration of the demographic and economic situation of the rural population. As adequate production of food and food self-sufficiency have been among the strategic priorities of national governments, macroeconomic policies make efforts to support agricultural production both at the national and international level. Therefore, the Common Agricultural Policy has been one of the oldest policies of the European Communities. However, this support increasingly deviates from direct support of production towards harmonic development and diversification of activities in rural regions. With regard to these facts, the authors attempt to identify the particular causal relations between selected indicators at the level of territorial units NUTS III – the regions of the Czech Republic, and to verify the actual existence or non-existence of these relations. Noticeable differences between regions have been found, measured by the share of the agricultural sector in the regional GDP and employment. Subsequently, the authors have identified a dropping tendency between the share of agricultural employment and average income. On the other hand, no relations of dependency have been found between the GDP and agricultural employment and registered unemployment. Neither has the relation between agricultural employment and the GDP per inhabitant been identified as statistically significant. However, there is a high degree of dependence between the share of agricultural employment and the GDP per inhabitant generated in the agricultural sector, between the share of the country population (population density) and the GDP per inhabitant generated in the agricultural sector, and finally between the population density and the GDP generated by the agricultural sector in the particular region (Figures 6, 7, 8 and 9). It can be derived from these facts that their economic structure and demographic situation determine the variability among regions. In the future, these regions should receive aid targeted at the development of rural regions. Identification and statistical evidence of the problems of agriculturally-oriented regions is an important prerequisite for drawing funds from the European Communities programmes and for the establishment of effective macroeconomic policy at the national level. However, despite all the conclusions given above, it can be stated that at the present time agriculture apparently neither contributes to greater unemployment nor it lowers the efficiency of the economy measured by the region's GDP.

**Keywords:** Czech Republic, agriculture, higher territorial administrative units, unemployment, GDP per capita, rural development

**Abstrakt:** Ve všech vyspělých světových ekonomikách docházelo v minulosti k výraznému poklesu podílu sektoru zemědělství na tvorbě hrubého domácího produktu a zaměstnanosti. Přesto lze stále najít výrazné rozdíly mezi jednotlivými zeměmi i v rámci regionů jednotlivých zemí. Příjmy pracujících v zemědělství jsou pak tradičně nižší, což vede následně k odlivu obyvatel z venkovských oblastí do měst a dalšímu zhoršování jejich demografické a ekonomické situace. Jelikož dostatečná produkce potravin a nezávislost zemí na jejich dovozu je jednou ze strategických priorit národních vlád, je snahou makroekonomických politik podporovat zemědělskou produkci jak na národní, tak na nadnárodní úrovni. Jednou z nejstarších politik Evropských společenství se proto stala tzv. Společná zemědělská politika. Stále více se však podpora odklání od přímé podpory produkce k harmonickému rozvoji a diverzifikaci aktivit venkovských oblastí. Autoři se v této souvislosti zabývají identifikací konkrétních kauzálních vztahů vybraných ukazatelů na úrovni územních jednotek NUTS III – krajů v České republice, respektive ověření jejich existence – neexistence. Jednoznačně byla identifikována výrazná variabilita mezi regiony měřená podílem zemědělského sektoru na tvorbě hrubého domácího produktu a zaměstnanosti (obr. 1). Následně pak autoři identifikovali klesající tendenci mezi podílem zaměstnanosti v zemědělství a průměrnou mzdou (obr. 2). Naopak závislost nebyla prokázána u vztahů hrubý domácí produkt a zaměstnanost v zemědělství a registrovaná nezaměst-

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nanost (obr. 3 a 4). Statisticky průkazný se neukázal ani vztah mezi zaměstnaností v zemědělském sektoru a hrubým domácím produktem na obyvatele (obr. 5). Vysoká závislost však existuje mezi podílem zaměstnanosti v zemědělství a HDP na obyvatele vytvořeném v zemědělském sektoru, podílem venkovského obyvatelstva, resp. hustoty obyvatelstva na HDP na obyvatele vytvořeném v zemědělském sektoru a konečně hustotou obyvatelstva a HDP vytvořeném v daném regionu sektorem zemědělství (obr. 6, 7, 8 a 9). Z těchto skutečností lze vyvodit, že variabilita mezi regiony je dána jejich ekonomickou strukturou a demografickou situací. Tyto regiony by pak v budoucnu měly být příjemci pomoci směřující k rozvoji venkovských oblastí. Identifikace a statistické prokázání problémů zemědělsky orientovaných regionů je pak nezbytnou podmínkou pro čerpání finančních prostředků z programů Evropských společenství a pro formulování efektivní makroekonomické politiky na národní úrovni. Přes všechny uvedené závěry lze konstatovat, že zemědělství zřejmě v současné době v ČR nezhoršuje nezaměstnanost, ani nesnižuje výkonnost ekonomiky měřené regionálním HDP.

**Klíčová slova:** Česká republika, zemědělství, vyšší územně správní jednotky, nezaměstnanost, hrubý domácí produkt na obyvatele, rozvoj venkovských oblastí

## INTRODUCTION AND AIMS

The decreasing trend in terms of agricultural sector share in the total GDP and employment could be observed in most developed world economies including West Europe since the 60s of the last century (Sommers 1998). Similar trend can be tracked in the Czech Republic, with increasing dynamics after 1989. In spite of this process, we can still find regions where the reviewed variables (Figure 1) exceed the average values. Such regions usually possess certain specifics. This article deals with the analysis of the selected specifics.

Rural areas lagging behind the EU average in terms of per capita GDP are historically in special focus of the European Communities. Regions with high proportion of agricultural sector in the total GDP and employment have traditionally had lower living standards measured by income per capita. This leads to outflow of residents from these areas to municipalities. Consequently, it has a neg-

ative effect on demographic structures in rural areas and brings social tensions in cities. The objective of the Common Agricultural Policy and the Structural/Regional Policy is therefore to provide financial aid to those regions through different kind of support programs. The aim of the financial support is to increase diversity of GDP creation in rural areas, to increase income in agricultural sector, to generate income from non-agricultural activities, to strengthen the role of agricultural production in sustainable development and to eliminate the population outflow from rural regions towards urban areas (Hučka 2001).

## MATERIALS AND METHODS

The authors have used data acquired from materials of the Czech Statistical Office aggregated at the statistical level NUTS III (Higher Territorial Administrative Units)

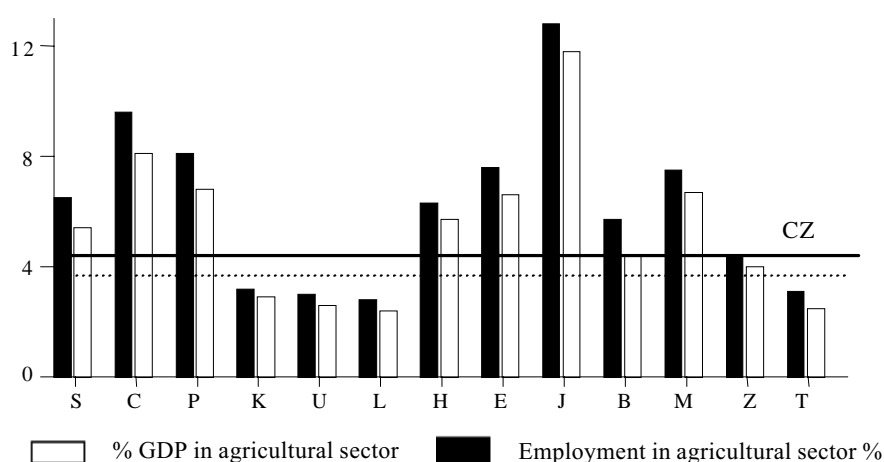


Figure 1. Variability among NUTS III regions in the Czech Republic in terms of employment in agricultural sector and GDP created in agricultural sector

<sup>1</sup> S – Středočeský, C – Jihočeský, P – Plzeňský, K – Karlovarský, U – Ústecký, L – Liberecký, H – Královéhradecký, E – Pardubický, J – Vysočina, B – Jihomoravský, Z – Zlínský, M – Olomoucký, T – Moravskoslezský

in the Czech Republic, for the year 2000. Regarding the special economic position held by the capital of Prague among the rest of Czech regions, the data for Prague were excluded from our analysis. In the graphs, individual regions are marked by the alphabet letters used for the newly introduced SPZ<sup>1</sup> (motor vehicle registration plate).

For the purpose of this article, authors used the following variables (numbers in brackets giving the minimum and maximum values in the group of analysed regions):

- proportion of labour force of agricultural sector in total employment (3–13%)
- proportion of GDP created in agriculture and forestry sectors in the total regional GDP (2.5–12%)
- registered unemployment at regional level (6–16%)
- average wage (11 700–13 500 CZK)
- regional GDP per capita (148–175 thousands CZK)
- regional agricultural GDP per capita (3.9–18 thousands CZK)
- population density in the region (75–230 person per square kilometre)
- proportion of rural population in the region – municipalities with less than 2 000 inhabitants (15–42%)

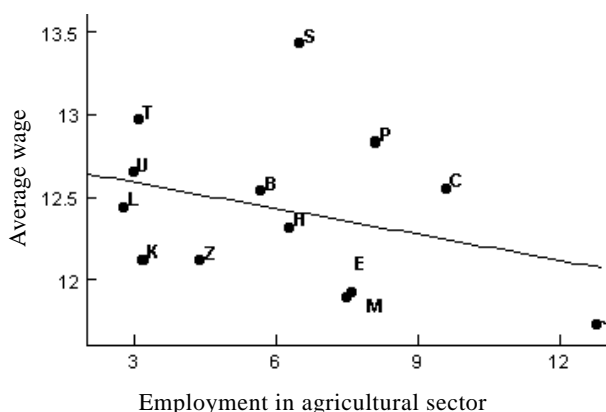


Figure 2. Relationship between employment in agricultural sector and average wage

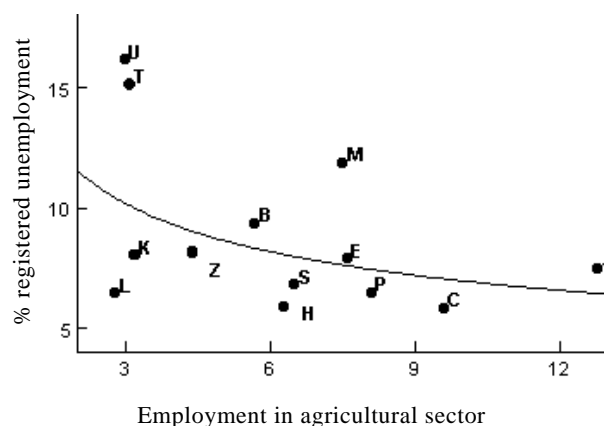


Figure 3. Relationship between employment in agricultural sector and registered unemployment

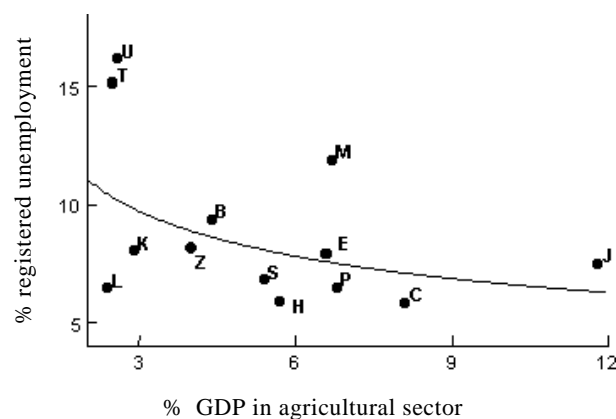


Figure 4. Relationship between GDP created by agricultural sector and regional registered unemployment

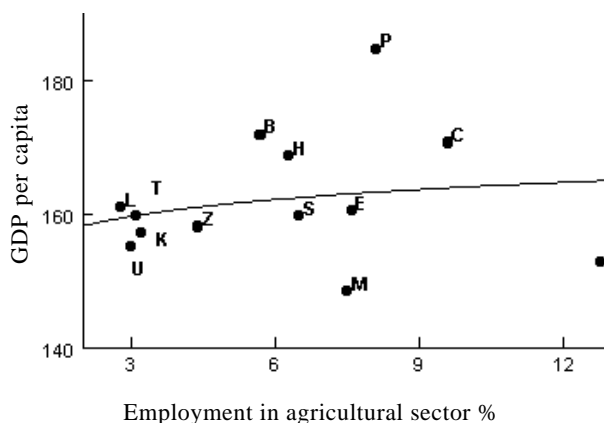


Figure 5. Relationship between employment in agricultural sector and GDP per capita

Causal dependencies among the selected variables are presented with use of dot (correlation) diagrams and mapped by the adequate function. Neither its equation nor the calculated intensity of regressions are presented in the figures, as the aim of the article was not to quantify the selected causalities. The aim was to test the existence or non-existence of causalities and to define their basic characteristics.

If we look at the Figure 1, we can observe significant variability among the Czech regions within selected variables (employment in agricultural sector and GDP created in agricultural sector).

This provides a big chance that some causality will more or less correspond with findings of the macroeconomic theories.

GDP per capita, sector structure of GDP and unemployment are the variables which are used to identify the target region for financial aid both at the national (statistical level NUTS IV) and the EU level (Structural and Regional Policy – Objective 1 and 2, statistical level NUTS II, respectively NUTS III) (Minařík, Lacina 2002).

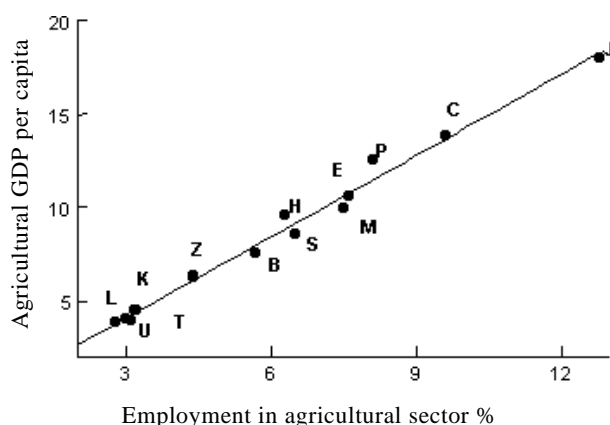


Figure 6. Relationship between employment in agricultural sector and agricultural GDP per capita

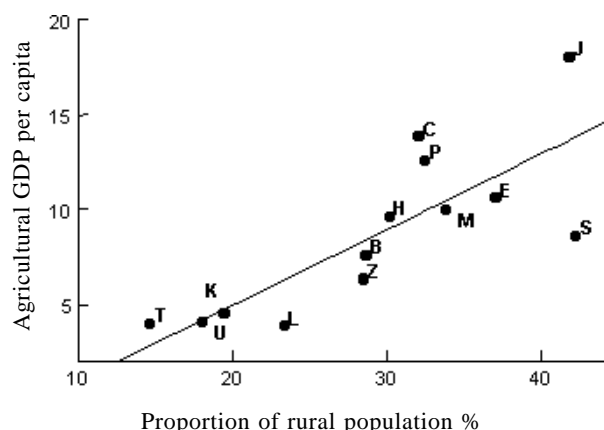


Figure 7. Relationship between proportion of rural population and agricultural GDP per capita in regions

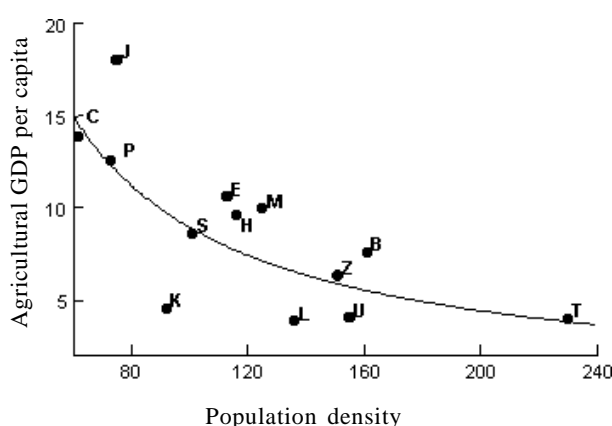


Figure 8. Relationship between population density and agricultural GDP per capita in regions

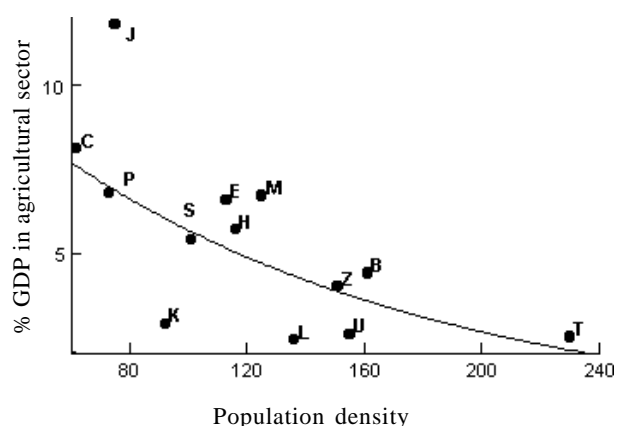


Figure 9. Relationship between population density and proportion of agricultural sector on total GDP created in the region

## RESULTS

Wages are traditionally lower in agricultural sector than in other sectors of the economy (industry and services). Therefore, we can expect that regions with higher proportion of agricultural sector in terms of employment than the national average will possess a lower average wage. Observed causality is significant in the Czech Republic, as it can be seen in Figure 2.

The causality is not significant in case of the Czech Republic. There are only two regions with structural problems (Ústecký and Moravskoslezský) which are above average in terms of the registered unemployment due to restructuring of coal mining and steel industries. The same conclusion may be applied for causality between GDP in agricultural sector and the registered unemployment measured in Figure 4.

The causality is not statistically significant, however, in Figure 5 we can see that some regions as Vysočina and Olomoucký are below the average (Figure 6).

As expected, this causality seems very significant – higher employment in agricultural sector means higher

GDP per capita created in agriculture. This indicates also that all regions have a very similar labour productivity in agricultural sector in average.

Figure 7 and 8 show, that demographic parameters have significant influence on position of agricultural sector. We can see that both regions with higher proportion of rural population and with low population density have significantly higher agricultural GDP per capita than other regions. Also the proportion of agricultural sector in the total GDP generated in the region (Figure 9) is significantly higher in regions with low population density. Those regions are traditionally agriculture – oriented, in case of Vysočina and Jihočeský regions, a significant role is played by the high proportion of forest in the total acreage.

## DISCUSSION

The authors were not able to obtain comparable statistical data to analyse the dynamics of the process in the Czech Republic. Limited data for international compari-

son were available at the time of work on this article. However, the authors consider the analysis of disparities among the EU member countries regions at the statistical level NUTS II, respectively NUTS III, to be valuable in future. In case of agriculture, Italy may serve as a typical example, with its decrease of employment in agricultural sector from 39.9% in year 1954 down to 3.9% in 1995 (Sommers 1998). Despite this observed trend, a significant disproportion in terms of GDP per capita, unemployment and sector structure of GDP still exists between the South and North of Italy (Kobzíková, Lacina 2001). Such disproportion has the consequent impact on demographic situation, internal net migration and further worsening of economic situation in the affected regions.

As was already mentioned, support of agricultural sector is one of the oldest problems of the European Communities (Common Agricultural Policy). The CAP priorities were slowly changing in history, starting solely with direct support of farmers and primary production, and so far finishing with support of broader rural and regional development (Lacina, Šild 2000). More attention is recently given to the harmonised regional development and diversity of activities in rural areas. As the funds provided within the EAGGF (European Agricultural Guarantee and Guidance Fund) are decreasing, more financial aid is relocated to the Structural Funds within the framework of the EU Regional Policy.

As the farmers in the Czech Republic will not receive the same amount of support through the CAP as the EU farmers from the beginning, more financial aid will be allocated in regional development. At present, it is already possible for project applicants to apply for financial support through the pre-accession program SAPARD. However, the money cannot be claimed automatically. There

are several conditions that have to be fulfilled to gain the support. At the beginning, problem region has to be identified. In this area, the statistics will play its essential role. The aim of the authors (and this article shall be the first step) is to contribute to developing a methodology of problem regions identification, with special focus on rural regions with high proportion of agricultural sector in the GDP creation. The authors are planning to continue in their research to find causalities among the analysed variables and to provide some recommendations for effective policy at both the national and the EC levels. Only the explicit identification of the above-presented problems can lead to effective use of the scarce financial resources.

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