IMPLICATIONS OF RESOURCE STRUCTURE ON THE PARTIAL PRODUCTIVITY OF AGRICULTURE

MILOS TOSIN,
MARIJA KNEZEVIZ,
BILJANA STAVLJANIN

Faculty of Economics Subotica
University of Novi Sad, Serbia

JEL Classifications: Q10

Key words: Resource supply, productivity of labor, productivity of land, competitiveness, different types of agriculture.

Abstract: Resource structure in the observed countries, who belong to different agriculture types expressed through relationship land/work ratio, indicates significant variations. Different resource supply is crucial in determining the level of productivity of labor and land in agriculture, and therefore, affects the competitiveness of agriculture, the competitiveness of an entire national economy as well.

ISSN: 1804-0527 (online) 1804-0519 (print) PP.49-51

Introduction

The main subject in the work is agriculture production performance in some countries who represent the American type of agriculture (A-type)[1], the Japanese type of agriculture (J-type)[2] and the European type of agriculture (E-type).[3] Mentioned representative countries have different resource supply and, consequently, achieve different levels of labor productivity and soil, which affect the competitiveness of their agriculture. For visibility, and because of the availability of data, analysis was performed for the period 1980-2007. Calculations were made only for the selected countries which are assumed to be relevant examples of these three types resource structures.

Resource structure of agriculture

Resource structure of agriculture determined by the factor ratio Soil / Work (S / W)[4], determines dominance in the use of mechanical or chemical-biological technologies, which continue to affect the differences in the level and growth of partial productivity. Productivity in agriculture is essentially determined by the level of economic development, land and resource-ecological conditions. With the narrowing gap in economic development in developed countries, it is becoming increasingly obvious that differences in agricultural productivity is primarily determined by resource conditions. In the past, differences in economic development in these economies were so prominent that it appeared that the resource-environmental factors do not have more important influence on the productivity of agriculture (Trkulja et al, 1983). Partial productivity of land are "linked" through relationship Soil / Work, which can be expressed through the relation:

$$(P / W) = (P / L) * (L / W)$$

Where P, W, L are the production, labor and land, respectively.

Analysis of the resource structure of agriculture, shows that Canada and the United States, as well as representatives of the American type of agriculture, have much better resource structure in a relationship with the Japanese and European type of agriculture. The average farmer in the American type of agriculture has approximately 68.1 hectares of arable land, while on the other hand, countries of the Japanese type of agriculture have unfavorable resource structure. Countries with the European type of agriculture, in terms of resource advantages, are placed between the previous two extremes (Figure 1).

Comparison of the level of resource supply shows a significant gap between listed types of agriculture. High initial differences over time have increased, so in 2007 the average farmer in the American type of agriculture carried about 50 times better resource supply compared to the average farmers in selected countries of the Japanese type of agriculture, or 6 times higher resource supply in relation with countries of the European type of agriculture (Figure 2).

Partial productivity of agriculture

Productivity in agriculture is analyzed from the aspect of partial productivity of agriculture - labour productivity (P / W) and productivity of the soil (P / L). Labour productivity in agriculture is determined by the relationship between agricultural production and the final number of active agricultural population, expressed in thousands of international US Dollars from the 1990 (faostat.fao.org). Productivity of land is determined through relationship between agricultural production and the arable land, expressed in thousands of international US Dollars from the 1990.

[1] In this article we assume that the resource characteristics and partial productivity of Canada, USA, Australia and Argentina make up the American type (or A-type) of resource structure in agriculture.

[2] Japan and India are suggested as countries who might represent the Japanese type (or J-type) of agriculture.

[3] United Kingdom, France, Greece and Italy are countries that, in terms of resource structure, viewed in our study as examples of the European type of agriculture.

[4] Resource supply is expressed in hectares of agricultural land per active farmer.

FIGURE 1. RESOURCE STRUCTURE OF AGRICULTURE

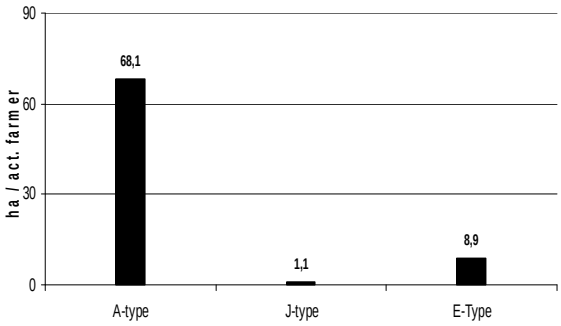


FIGURE 2. MOVING THE LEVEL OF RESOURCE

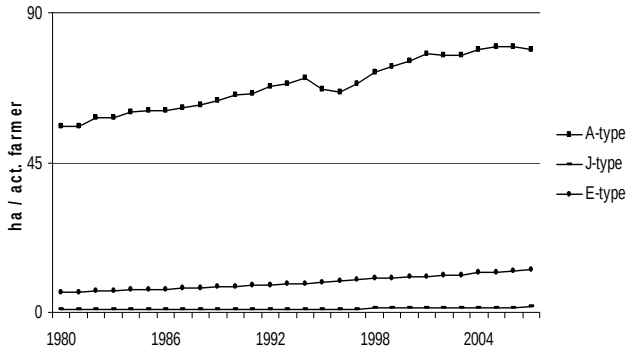


FIGURE 3. GRADATIONS IN THE LEVEL OF LABOR PRODUCTIVITY (P / W)

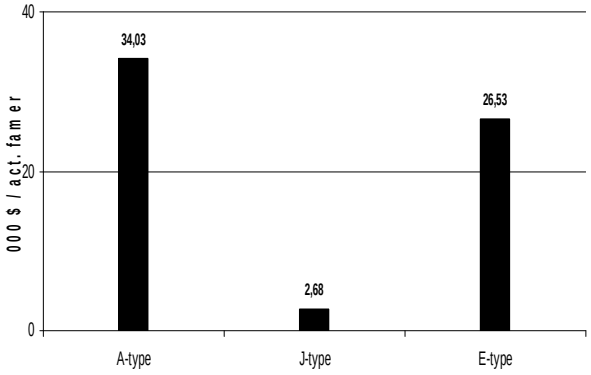


FIGURE 4. THE LEVEL OF LABOR PRODUCTIVITY IN AGRICULTURE (P / W)

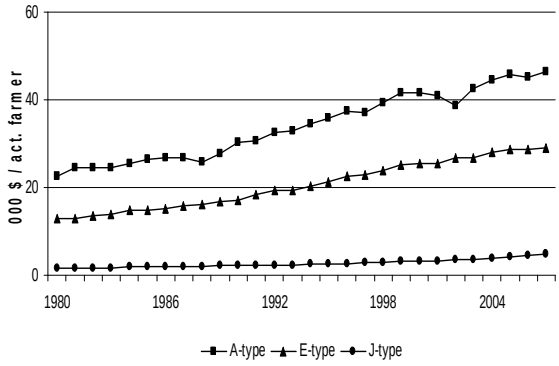
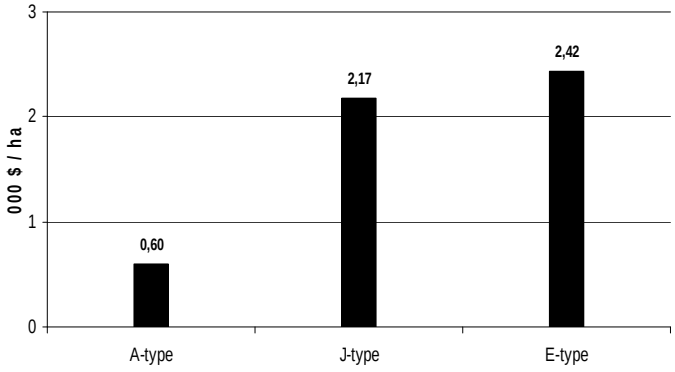


FIGURE 5. GRADATIONS IN THE LEVEL OF PRODUCTIVITY OF LAND (P / L)



Source: faostat.fao.org and calculations of authors for Figures 1-5.

Gradations in the level of agricultural productivity show considerable differences between these groups of countries, and to a lesser extent between countries within a certain type of agriculture (Figure 3).

The country of American type of agriculture demonstrates the highest labour productivity in agriculture (34 030 USD / active famer). Lowest labour productivity is shown by the country who belongs to Japanese type of agriculture (2 680 USD / active famer). The cause of the relatively low labour productivity in the Japanese type of agriculture is in a relatively unfavorable resource structure and retention of farmers in their farms.

Initially high differences in the level of labor productivity have been increasing over time. In 2007 year the average farmer in selected countries of the American type of agriculture carried about 10 times higher the volume of production compared to average farmers in selected countries of the Japanese type of agriculture, or 1.6 times higher than the average farmers in selected European countries (Figure 4).

When analyzing the productivity of the land, situation is favorable for the countries of the Japanese type of agriculture. They demonstrate, on average, the three time higher land productivity compared to analyzed countries of the American type of agriculture. However, selected European countries have achieved higher productivity of land in relation to the countries of the Japanese type of agriculture. The cause of the relatively high productivity of land in these countries is a high volume of production relative to available land (Figure 5).

Concluding observations

At the beginning it was concluded that differences in agricultural productivity primarily depends on the resources. Resource structure of the countries of Japanese agriculture is considerably less favorable in relation to the countries that belong to other types of agriculture. The fact largely determines the relatively lower level of labor productivity in agriculture and a relatively higher level of productivity of land. The consequence of this state is a lower level of competitiveness of the agricultural sector in relation to countries of American and European type of agriculture. On the other hand, countries with luxuriant natural resources are focused on the relatively low production per unit area and high production per employee. The conclusion is that in these countries, installed power per employee is very high, and consumption of fertilizer per land is very low.

References

Mundlak, Y., 2000. “Agriculture and economic growth - Theory and measurement”, Harvard University Press, Cambridge, Massachusetts London.

Norton, R., 2004. “Agricultural development policy”, John Willey & Sons Ltd., The Atrium Southern Gate, Chichester.

Reynolds, G., 1975. “Agriculture in development theory”, New Haven and London, Yale University Press.

Ruttan, W., 2001. “Technology, growth, and development”, Oxford University Press, New York.

Stipetić, V.,1987. “Poljoprivreda i privredni razvoj”, Informator, Zagreb.

Trkulja, M., Dundjerov, M., Gajić, M., Lovre., K., 1983/2000. “Svetska poljoprivreda, tendencije i izgledi”, Poljoprivredni fakultet - Novi Sad, Ekonomski fakultet Subotica, Novi Sad - Subotica.

Zakić, Z., Stojanović, Ž., 2008. “Ekonomika agrara”, Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu, Beograd.

Zekić, S., 2003. “Razvojne performanse poljoprivrede zemalja Centralne i Istočne Evrope u tranziciji”, Magistarska teza, Ekonomski fakultet, Subotica.

Zekić, S., 2008. “Reforma agrarnih politika i restruktuiranje poljoprivrede zemalja Jugoistočne Evrope u procesu evropski integracija”, Doktorska disertacija, Ekonomski fakultet, Subotica.

www.faostat.fao.org

www.earthtrends.wri.org