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Conference Paper

Impact of Rural and Employed Population in the Agricultural Sector in Economic Development of the Republic of North Macedonia

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Abstract

For better performance, human efforts (work), whether mental or physical, should be combined with other factors of production. Given the fact that these factors depend on productivity, account should be taken of investment in research and development in all sectors, as well as in the agrarian sector, as it would be influenced by the growth and economic development of a country. The purpose of the research is to prove that the growth of the rural population can not affect the growth of agricultural income if there is no professionalism, sufficient motivation and support of the population by the state institutions. The focus remains on the importance of the agrarian sectors in the economic development of the country and the ratio of this sector to the two other sectors of the economy (industry and services), which together build the economy of the Republic of North Macedonia, as well as the contribution that each of them give in building up the GDP of the state. To achieve this goal, methods that are characteristic of social sciences are used: analysis and synthesis, comparisons and statistical methods through simple regression. While the data used are relevant to the country and abroad.

Keywords: Agrarian economy, Human capital, GDP, Economic development

Introduction

Human endeavors, whether mental or physical, have always been a promoter of social development. But if we want to increase productivity among the major factors of production, the use of technology must also be added. So, agricultural productivity is directly dependent on human capital and technological progress. For these reasons, it is not only important what the share of the rural population in the total population of the country (which is taken as a precondition for agricultural development), but also to see what social and rural policy all the elements of promoting development through modernization are guided by and structural adjustment of the agri-food sector, as well as encouraging economic activities to preserve the natural, cultural and developmental values of rural areas, which are defined according to needs, opportunity, goals and objectives of an efficient and effective policy. Therefore, the productivity of the rural farmer cannot be increased except through the provision of adult education and the use of agricultural technologies to save labor. Widespread economic growth is likely to require more skilled labor and an increased demand for investments in the education of future generations.

Considering the fact that productivity depends on these factors, investment in research and development in all sectors, as well as in agriculture, it should be taken into account, that they could have a great impact on the economic growth and development of a country. And how vital is the agrarian sector and what role has the country's economic development since the country's independence until 2016 will be presented through this paper, which focuses on these dilemmas.

The focus of the research is the importance of agriculture in relation to the other two sectors in the economy (industry and services), which together build the economy of the Republic of North Macedonia, as well as the contribution each of these sectors makes to the construction of the country's GDP. In this case, there is another dilemma about the factors that actually affect the growth of agriculture, and thus the increase in the GDP of the state, the rural population or the increase in the number of employees in agriculture.

The purpose of the research is to confirm that the increase in rural population has no impact on increasing of agricultural income if it is not professionalized, sufficiently motivated and supported by the state institutions, bearing in mind the production risk that may follow the agricultural activity outlined above.

Based on the questions asked in this case, the hypotheses are:

H1- The contribution of the agricultural sector is greater as an employer than as a contributor to the GDP of the Republic of Macedonia,

H2- Increasing rural population does not have a positive impact on increasing agricultural income in the Republic of North Macedonia,

H3- The agricultural sector employees are those that have an impact on the increase of the income in the agricultural sector as well as in the GDP of the Republic of North Macedonia.

The World Bank data for the Republic of North Macedonia from 1992 to 2016 were mainly used to track reports of raised dilemmas, hypothesis verification and research findings. The EXCEL program was used to process the data and illustrations presented in the graphs, and the SPSS statistical package was used for testing the hypotheses and their presentation, especially regression analysis, which noted the impact of the tested variables.

Literature Review

Countries differ and are characterized by varying employment participation in the sectors that develop their economies. According to the World Bank (2016), there are many countries where the industry is a major employer such as the Czech Republic (29%), Poland (23.7%), Slovenia (22.7%), and unlike those in Romania, agricultural activity is still the largest employer (24 percent) of the total employees in that country.

According to the State Statistical Office (2016) survey data, the total number of agricultural holdings in the Republic of Macedonia is 178 125. On average, one agricultural holding uses 1.8 hectares of agricultural land and has 2.1 livestock units. According to the same source, the total agricultural land used by agricultural holdings is 320 738 hectares, and of the total number of farms 60.8% use up to 1 hectare of agricultural land. Agricultural holdings have a total of 381 361 livestock units.

Agriculture remains one of the risk-producing activities due to several factors that make this activity complex for its users. According to Zakich and Stojanovich (2008), production risk is related to the inability of farmers for objective and subjective reasons to provide a satisfactory level in their farm. Objective causes are manifested in different types, in the form of natural disasters and new forms of risks such as diseases, epidemics, etc., which can reduce the level of productivity. On the other hand, the subjective reasons, especially for individual farmers, relate to the inability of farmers to ensure proper management of farm production and lack of capacity for innovation. The same authors share the view that the quality of human resources and the management of innovative models increase productivity. And according to (Lutz, 1998, p. 36) the development of agriculture faces enormous challenges. By 20120, the planet would support about 8.4 billion people. Even if enough food is produced, about 800 million people will be left without enough food to eat (this includes 180 million low-birth-weight infants). According to the same author, despite doubling global incomes in the last three decades, the number of people living in poverty is still increasing, from 944 million to 1.3 billion.

To formulate policy goals and strategies to benefit the whole of society according to (Marshall and Bannister, 2007, pp. 480-482) requires knowledge not so much of the world as it is today, but as much as it could or could. it had to be organized including human needs as a whole and in the context of long-term quality of life. And when it comes to the citizen or the person, we should point out that it is a very universal term, and on the other hand it is possible to consider it in an economic context, ex. as a factor of production. According to (Plaster, 2011, pp. 38-39) man can be considered as another kind of entity and factor of production.

Also, in order to achieve high production of agricultural products one of the technical aspects of production is the irrigation of those crops. According to (Lem, Ayars& Nakayama, 2007, pp. 6-7) as the industry progressed, so did the interest in micro-irrigation of crops as well as the design of devices with cheaper systems in developing countries.

The extent to which the Republic of North Macedonia supports the agricultural sector, given the risks involved in this type of production, can be seen from the initiative and financial support offered by the state. In this case it is worth mentioning the Agency for Financial Support to Agriculture and Rural Development (AFSARD) which has the right to manage IPARD funds (European funds) in the field of agriculture and rural development. According to AFSARD (2017) the total amount of the measure in denars for 2016 was 6,320,000,000 denars. But how much is enough remains to be seen from the income generated by the agricultural sector and its contribution to the GDP of the Republic of North Macedonia.

Analysis of the contribution of agriculture, industry and services to the gross domestic product of the Republic of North Macedonia

In the beginning to see the contribution of the three main sectors that characterize the economy of the country, the following illustration shows the contribution that each of these sectors has to the GDP construction in the Republic of North Macedonia. Figure 1 shows that services have the highest share of GDP, with the lowest contribution in 1992 with 43.85% and higher in 2012 with 65.10%. The services followed the industry with the lowest contribution in 2009 with 21.95% and the best result in 1992 with 39.09%. And the third is the agricultural sector with the lowest contribution in 2006, with 10.34% and higher in 1992 with 17.06%.

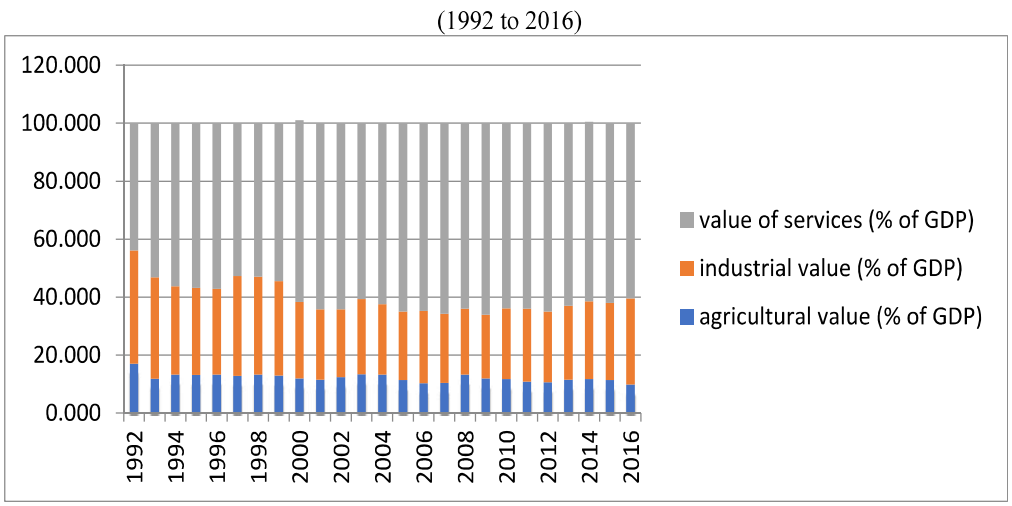

Figure 1. Contribution of agriculture, industry and services to GDP of the Republic of North Macedonia
Source: www.worldbank.org

When it comes to the structure of the economy of the Republic of North Macedonia, although agriculture ranks third in terms of GDP creation, the World Bank data in the graph below shows that by sector of employment, this sector ranks second, with the worst share in 2016 with 29,084%, the best in 1992 with 41,673%, right after the service sector, which emerges as the sector that employs the largest number of labor force (% of total number of employees in the Republic of North Macedonia), with the worst result in 2016, with 49,376% and the best with 57,532% in 1992. The industry ranks third with the lowest percentage of employees ranging from 19,715% in 1998 to 21,767% in 2012.

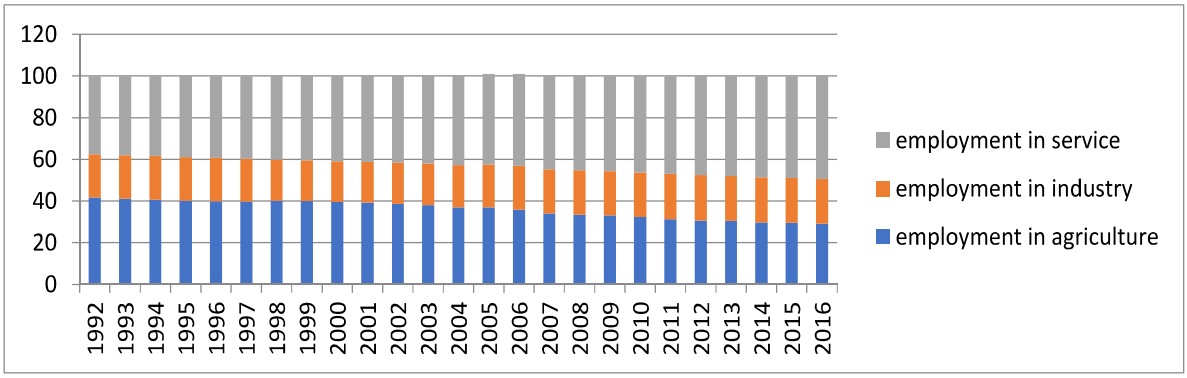

Figure 2. Contribution of agriculture, industry and employment services to the Republic of North Macedonia from 1992 to 2016 (% of total employees)
Source: www.worldbank.org

Figure 1 and 2 confirm the first hypothesis that the contribution of the agricultural sector is greater as an employer than as a contributor to the GDP of the Republic of North Macedonia.

Given the fact that countries with populations living in rural areas meet this precondition considered important for agricultural development, it is worth mentioning the fact that the Republic of North Macedonia since independence has been characterized by a 40-43% rural population. From then until 2016 the lowest rural population was in 1993 (40,079%), and the

highest percentage of rural population was in 2012 when the rural population reached 43,041% of the total population of the Republic of North Macedonia.

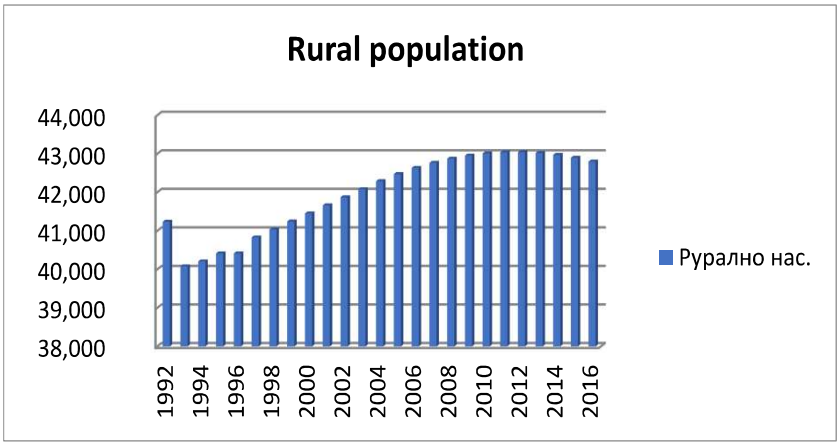

Figure 3. Rural population of the Republic of North Macedonia from 1992-2016 (% of total population)
Source: According to World Bank data www.worldbank.org

Results of regression analysis

In economic research, linear regression analysis is often used. The variable that we want to predict in regression analysis is called the dependent variable, and the variables used to predict are called independent variables.

In our research we applied a simple regression analysis given by the mathematical function Y = a + bX. On the basis of this statistical method we will analyze the relation between the independent variable X, in our model, the Rural Population of the Republic of North Macedonia RN (% of total) and the dependent variable Y, ie the value of agriculture VZ (% of GDP). The data for the regression calculation are taken from the World Bank's 25-year annual reports from 1992-2016. The results of the analysis are as follows: Y = 47,272 + (-0,835) X. The negative sign of the coefficient X indicates that variables Y and X are negatively correlated, meaning that if the rural population increases, the value of agriculture will decrease by 0.835 times, and vice versa if the LV decreases then the LV will increase as well. This model is checked by the determinant test where $r^2 = 0.555$, which means that the model gives 55.5% basis for prediction.

The following is a table showing the regression analysis of the rural population and its impact on the value of agriculture in the Republic of North Macedonia (% of GDP)

Table 1. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,555[a]	,308	,277	1,254786

a. Predictors: (Constant), Rural population of RNM (% of total population)

Table 2. Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	47,272	10,976		4,307	,000
	Rural population of the RNM (% of total population)	-,835)	,261	-,555)	-3,196)	,004
a. Dependent Variable: agriculture value added				(% of GDP)		

Source: own research based on World Bank data

We conducted another regression analysis to compare whether agricultural employees influence the value of agriculture. In this model we will take the independent variable X - Employed in agriculture (% of total employees) and the dependent variable Y is the value of farming VH (% of GDP). The data for the regression calculation are taken from the World Bank's annual reports for the period 25 years from 1992-2016. The results of the analysis are as follows: Y = 4,249 + 0,221 X. The positive coefficient X sign indicates that variables Y and X are positively correlated, meaning that if the Agricultural Employees increase by their number, the VC will increase by 0.222% and vice versa. This model is checked by the determinant test where $r^2 = 0.639$, which means that the model provides 63.9% basis for prediction.

The table showing the regression analysis of agricultural employees (% of total employees) and its impact on the value of agriculture in the Republic of North Macedonia (% of GDP) gives the following results:

Table 3. Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,639[a]	,408	,382	1,160405
a. Predictors: (Constant), employed by agriculture (% of total employees)				

Table 4. Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,249	2,011		2,113	,046
	Agricultural employees (% of total employees)	,221	,055	,639	3,980	,001
a. Dependent Variable: agriculture value added (% of GDP)						

Source: own research based on World Bank data

Conclusion

In the former Yugoslav Republic of Macedonia, agriculture (along with forestry and fisheries) is the third largest economic sector in the services and industry sector of the Republic of North Macedonia with a 12.204% GDP contribution and second as an employer. According to the data from the World Bank (2016) used for this paper, the Republic of North Macedonia from 1992-2016 participates with 36,112%. The contribution of such a large percentage of employees in this sector gives us the right to say that agriculture is one of the basic branches of the North Macedonian population. However, the fact is that the conditions under which and in which it operates and exists today below the level of modern agriculture and far from the standards practiced by countries with more developed agriculture.

The two analyzes of regressions presented in the paper conclude that the increase in the rural population will not lead to an increase in GDP, as many additional measures characterizing the rural population are needed. So the rural population is not productive because agriculture as a sector is one of the most neglected in North Macedonia and is considered as something everyone has knowledge and knowledge about. The variable that had a positive impact on the value of agriculture is the percentage of agricultural employees, not the growth of the rural population.

Key support from local and central government must come from conductive policy and institutional frameworks, including adequate land management, labor and capital resources.

An important condition for faster development of agricultural production, as well as rural development, is a well-established and effective system of non-formal education for farmers and rural population in the Republic of Macedonia. Disqualifications can be realized with the help of foreign agencies, through seminars and workshops as good opportunities to exchange experiences. By financing human resources, the state's investment in this capital will pay off very shortly. Also, sustainable development in rural areas must be technically fast and innovative and must take into account environmental and social impacts. Great technical innovation is needed to move closer to ecologically and socially sustainable development of rural areas.

The ultimate goal should remain to further enhance the competitiveness of the agricultural sector on an open and changing market and to maintain the development of rural areas through the optimal use of the engaged natural resources.

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