INVESTMENTS IN SERBIAN AGRICULTURE

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ABSTRACT

The paper shows the relation between gross domestic product (GDP) and investments in the Republic of Serbia. The observed relation was analyzed at the economy level, as well as in agricultural particular. The observation period is from 2005 to 2020. The function of investments is overviewed through the capital ratio. In this way, it was established to what extent part of the newly created value is returned to the production process, both at the level of the entire economy and at the level of agricultural activity separately. The low participation of investments in the gross domestic product is highlighted, which indicates an unfavorable relationship towards economic and agricultural activity for the observed time period.

Introduction

Agriculture production as a main economic activity of primary sector represents relevant part of the national economy of the Republic of Serbia. This activity has a

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significant share in the creation of the gross domestic product (GDP), although in recent years there is a tendency of relative decline. Milić et al., (2008) allege that the average participation of the GDP from agriculture in total GDP in the period 1996-2005 was 19.37%. Comparably, recent research indicates a gradual decrease in the share of the gross added value (GVA) of agricultural production in the total GVA of the Republic of Serbia, for the period from 2002 to 2015, at a rate of -5.4% annually (Novaković, 2019). Previously alleged facts confirm the presumption that as the economic activity of a country increases, the participation of agriculture in the formation of GDP decreases. According to data provided by World Bank (2021), the primary sector in the EU participates on average with 1.6% in the formation of GDP. In Republic of Serbia that share is significantly higher-6.34% (Statistical office of Serbia-SORS, 2022). In absolute terms, the GDP generated from agriculture in the Republic of Serbia has a tendency to grow, although there are certain fluctuations caused by: global inflation rate, weather conditions… The GDP is constantly increasing and economic activities from the secondary and tertiary sectors significantly contribute to the formation of GDP, while the relative participation of the primary sector is reduced to a single-digit rate. This phenomenon can be appraised as positive because the secondary and tertiary sectors achieve a higher added value than the primary.

According to the data provided by Statistical Office of the Republic of Serbia, engagement in agricultural employment in Serbia is declining. In 2012, 1.442.628 people worked (directly or indirectly) on these jobs, or 20.07% of the total population (SORS, 2012). In 2018, that share was 18.6%, or 1.336.940 people (SORS, 2018). The number of agricultural households is also decreasing. According to the 2012 agricultural census, there were about 631.000 registered households in Serbia, with an average of 2.3 people working on them. In 2018 about 560,000 households were recorded with an average of 2.4 people working on them (SORS, 2018).

In foreign trade balance only agricultural and food products show surpluses. The structure of the export of the Republic of Serbia is unfavorable, which further adversely affects competitiveness (Đukić et al., 2017). According to Marković (2010), "... in the last two decades, the dominant group in the structure of Serbian exports has been the primary product or products of lower stages of finalization (agricultural products, nonferrous metals and iron, timber, etc.)".

Sometimes it is difficult to achieve growth in agricultural production because both value factors (price and quantity) are often not under the influence of economically deprived countries, but under the control of global economic trends and climate factors that affect mainly primary production, which stands out in the Republic of Serbia. The aforementioned facts are only part of the reasons why agriculture must be encouraged and somehow protected by the state. In the Republic of Serbia, there are various types of support, but one of the most important for agriculture itself and the population in rural areas is defined by the Law on Incentives in Agriculture and Rural Development ("Official Gazette of RS", no. 10/2013, 142/2014, 103/ 2015 and 101/2016) which states that the budget of the ministry responsible for agriculture cannot be less than

5% of the budget of the Republic of Serbia for a given year. In such manner, a certain guarantee is created that funds will come to agriculture and contribute either directly or indirectly. In addition to economic development, creating GDP, employment, agriculture has another significant function - achieving food security. This aspect stems from organizing the production of agricultural products with one's own resources. In this way, agriculture presents on of the factors which are essential for stable functioning of the state. The best illustration of this allegations are the events of the last three years caused by the Covid-19 virus pandemic and the interstate conflict of countries that represent influential producers of (agricultural) raw materials in terms of energy and food markets.

Bearing in mind the importance of agricultural activity, the question arises to what extent it is necessary to invest and what is the willingness of society to give up the newly added value in order to return the funds to the sector that has proven to be significant. In accordance with alleged facts, the subject of this research are investments in fixed assets, their source of financing and GDP. Simultaneously, the main objective of this research is based on determination and analysis of the capital ratio, i.e., of the relation between GDP and investments in order to determine to what extent a part of the newly created value is returned to (agricultural) production, whether enough is invested in agriculture in order to achieve the goals defined by various strategic plans. In accordance with the defined subject and research objective, the following research hypothesis was defined:

H_0: Agriculture in the Republic of Serbia is not invested in the same share as it contributes to the economy, i.e., not enough for this sector to: achieve growth in production and productivity, adopt new technological solutions, modernize its fixed assets, successfully improve the vertical ally between crop and livestock production, ...

The research methodology and data source

Using the capital ratio, the relation between total investments and gross domestic product in the observed period is shown:

$$C = \frac{I}{GDP}$$

where are:

C- capital ratio; I - investments in fixed assets; GDP - gross domestic product (Milić et al., 2008).

Investments represent the use of a part of the domestic or available product to replace and expand the reproduction of basic funds in the economy and non-economic activities and to increase stocks, raw materials and unfinished production and finished products in the economy (Hirt and Block, 2005).

The majority of economic theorists, regardless of which economic school they represent,

agree that investments are the main accelerator of economic activities. Investments are of great importance for every national economy and they increase the GDP. Investment policy is considered one of the most important segments of economic policy. With better organization of work and management, better organization of the state, a higher level of general and professional education, greater use of production capacities, wider and faster application of technological progress, etc., a higher growth rate can be achieved at the same level of investment (Jurčić and Časni, 2018).

If investments increase and GDP remains the same, the capital ratio will increase, that is, a larger part of GDP would be returned through investments in (agricultural) production. Conversely, if investments decrease, the capital ratio will decrease.

Gross domestic product (GDP) represents the market value of all final products and services produced in a country for a period of one year. Real GDP per capita (corrected by the rate of inflation) is used as a key indicator in evaluating the economic strength of the country by year or for comparison with other countries (van den Bergh, 2007). It consists of funds intended for consumption and production.

If investments remain the same and GDP increases, the capital ratio decreases, that is, a smaller share of it is returned to (agricultural) production. In the case of a decrease in GDP at the same level of investment, the observed ratio increases.

Through the capital ratio, the results from the past and their part that is intended for further investment, i.e., investing in the future, are compared. The more society renounces consumption in the present, the higher this coefficient is, the assumption that better results will be achieved in the future.

The data were processed with standard statistical instruments of descriptive statistics such as: average value and average rate of change. The average rate of change is calculated according to the formula:

$$r = (G-1);\quad G = \left(\frac{Yn}{Y_1}\right)^{\frac{1}{n-1}}$$

where are: r - annual rate of change, G - constant relative change in value, Yn - absolute value of the last member of the series, Y_1 - absolute value of the first member of the series and n - total size of the series. (Tekić et al., 2019).

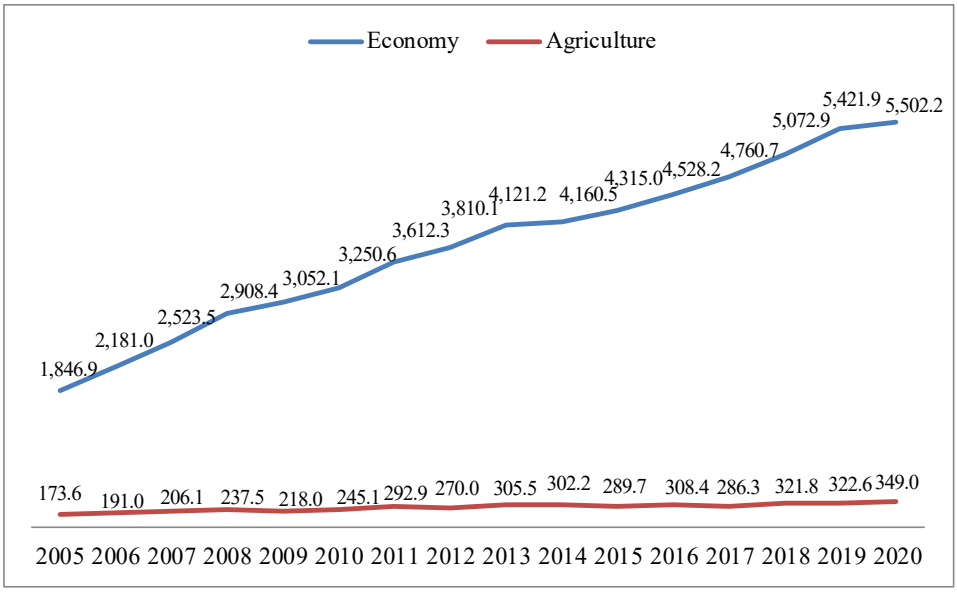
Data provided by Statistical Office of Republic Serbia related to the statistics of national accounts in current prices were used as the basic data sources (SORS, 2005-2020). Also, data from the World Bank were used, which refer to the participation of agriculture in the creation of GDP in the Republic of Serbia, the countries of the region and the European Union (WBO, 2020)

Results and discussions

The research results first showed the progress of agriculture's GDP and GDP during the observed period (Figure 1).

Figure 1 presented below shows the absolute growth of the total GDP as well as that one generated from agriculture. According to the data provided by SORS, the GDP of the Republic of Serbia has a pronounced tendency to grow during the observed period with an annual rate change of 7.55% per year. Agricultural activity has a slightly lower average growth rate, but it is still positive (4.76% per year).

Figure 1. The value of the GDP and the GDP from agriculture in the Republic of Serbia for the period 2005-2020, in current prices in billions of RSD



Source: author's calculation based on SORS data

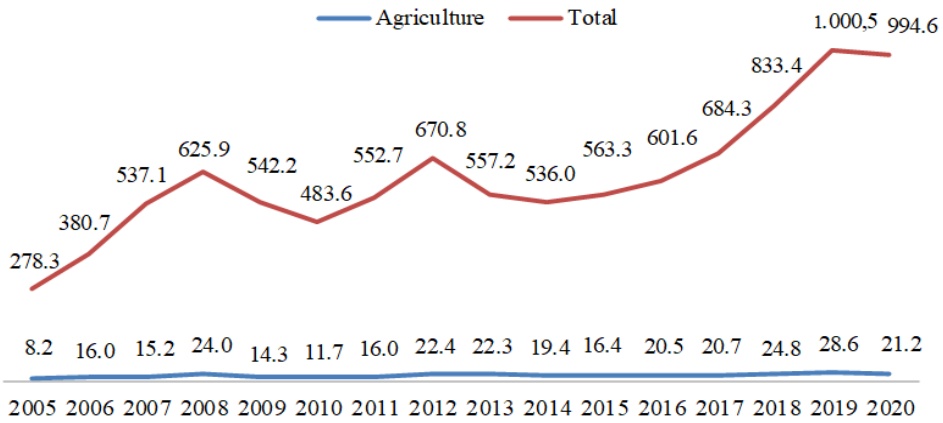
Looking at Figure 1 and the time series data from 1996-2005 (Milić et al., 2008), where agriculture accounted for almost a fifth of the total newly created value, it is concluded that agriculture continues to achieve GDP growth, but activities from the secondary and tertiary sectors simply do it more efficiently and progressively. For this reason, the relative participation of agriculture in the creation of GDP is decreasing, and the absolute values are increasing from year to year.

When looking at the GDP generated from agriculture in the Republic of Serbia in relation to other comparable countries, primarily from region that have a lot of comparable features (historical, cultural,... heritage and similar geographical features), the following groups of countries can be categorized: the first group consists of countries with a significant share of agriculture in the creation of GDP- Montenegro, North Macedonia and Albania, which has the most significant participation (19.12%). The Republic of Serbia and Bosnia and Herzegovina forms second group with approximately the same values (between 6% - 7%). The third group includes Bulgaria, Croatia, Hungary and Romania, which have averages almost twice as low as the Republic of Serbia (WBO,

2020). As comparative data, the EU average (1.65%) is used, whose agriculture is at a significantly greater level and which the observed countries tend to approach (some have already succeeded). Mizik (2012) states that the function of agriculture in the countries of the Western Balkans is greater than the average of European countries and that agriculture is characterized by: issues of imbalance, sectoral production, fragmented structure of agricultural holdings, relatively low yields, unfavorable structure of exports as well as poor hygiene and food quality control.

Comparison of total investments and investments in agriculture are shown in Figure 2. According to data provided by Statistical Office of the Republic of Serbia investments in the observed period tended to grow, which can be seen from Figure 2.

Figure 2. Value of total investments and investments in agricultural in the Republic of Serbia for the period from 2005 to 2020, in millions of RSD at current prices



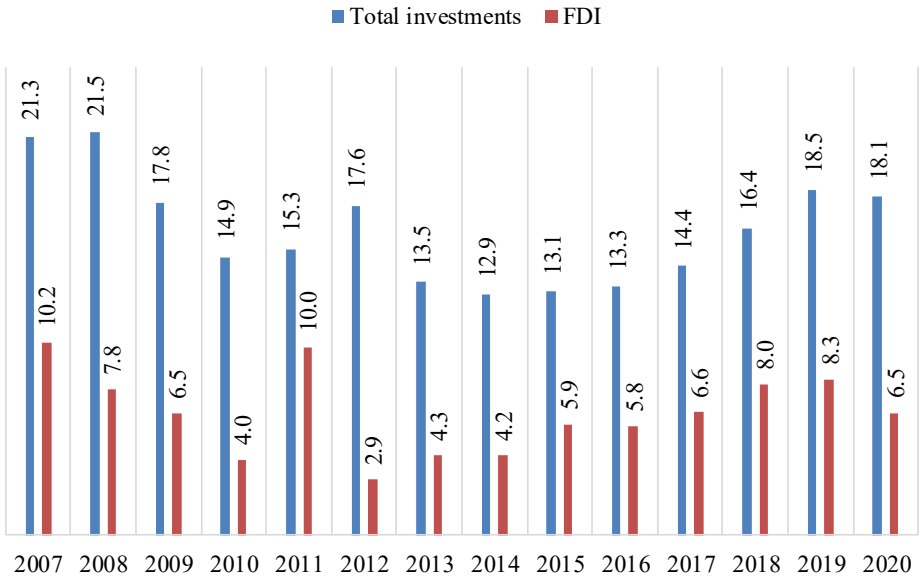
Source: author's calculation based on SORS data

From Figure 2, it can be seen that total investments in the observed period had a significant growth (8.86% per year on average). Investments in fixed assets were at the lowest level at the beginning of the analyzed period. Over time, investments increased gradually until the emergence of the world economic crisis in 2008 and 2009, when investments also decreased. However, when looking at the share of investments in agriculture compared to total investments, it comes to the conclusion that capital investments in this sector over the years were lower. This is supported by the rate of change, which for the entire observed period amounted to 6.6% on an annual basis. The average rate of investments in agriculture was 3.12% of total investments during the period from 2005 to 2020.

Investments in agriculture grew by an average of 6.6% during the observed period, while agriculture recorded an average absolute growth of 4.76%. Although the average investment rate was higher than the average growth rate, it was still insufficient to reach the growth achieved at the economy level (7.55%).

Investments represent a measure of investment in capital goods and also one of the main generators of economic development. In such manner, it is of particular importance to look at the ratio of foreign direct investments (FDI) and domestic investments generated from GDP (figure 3).

Figure 3. Ratio of total and foreign direct investments (FDI) in the Republic of Serbia in relation to GDP for the period 2007-2020. years, in % of GDP



Source: author's calculation based on SORS data

According to the data provided by Statistical Office of the Republic of Serbia in the period from 2007-2020 there were significant foreign direct investments (FDI). At the beginning of the observed period, investments accounted for 21.3% of total GDP, while FDI accounted for 10.2%. The lowest share of investments in relation to GDP was in 2014 (12.9%), and foreign investments in 2012 (2.9%). The highest values of the observed categories were those from the beginning of the period.

The calculation of the capital ratio at the economy and agriculture level is presented. In both cases, the period is divided into two sub-periods. The first one begins in 2005 because this paper can be seen as a sequel of a research conducted by Milić et al., (2008), in which the observed time series ends in 2005. What marks this period of time is the world economic crisis that began in 2008 and affected business activity in the following years, the consequences of which were observed until 2012. The second period marks the end of the world economic crisis and the gradual increase in economic activities (2013-2020). Tables 1 and 2 provide insight into the calculated capital ratios at the economy level of the Republic of Serbia, for the periods from 2005-2012 and 2013-2020 respectively.

Table 1. Capital ratio (economy level) for period 2005-2012, in millions of RSD.

	Year							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
I	278295,7	380673,3	537142	625875,6	542204,3	483646,3	552733,5	670802,3
GDP	1846853,2	2181034,6	2523495,5	2908444,7	3052135,5	3250581,3	3612266,6	3810057,9
C	0,15	0,17	0,21	0,22	0,18	0,15	0,15	0,18

Source: author's calculation based on SORS data

The capital ratio in the observed sub period had the highest value in 2008 (0.22), while its lowest value was recorded in 2005, 2010 and 2011, when it was 0.15. The average value of this indicator in the analyzed eight-year period was 0.176, which means that 17.6% of GDP was invested back into the economy.

Table 2. Capital ratio (economy level) for the period 2013-2020, in millions of RSD

	Year							
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
I	557239,9	535986,2	563283,1	601619,8	684290,7	833399	1000511,1	994602,4
GDP	4121200,2	4160548,5	4315020,4	4528191,9	4760686,4	5072932,2	5421851,3	5502216,3
C	0,14	0,13	0,13	0,13	0,14	0,16	0,18	0,18

Source: author's calculation based on SORS data

The capital ratio in the observed sub period had the highest value in 2019 and 2020 (0.18), while its lowest value was recorded in 2014, 2015 and 2016, when it was 0.13. The average value of this indicator in the analyzed eight-year period was 0.149, which means that 14.9% of GDP was returned through investments in the economy.

Tables 3 and 4 provide an insight into the calculated capital ratios related to agricultural activity for the periods from 2005-2012 and 2013-2020 respectively.

Table 3. Capital ratio (agriculture) for the period 2005-2012, in millions of RSD.

	Year							
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
I	8153,5	16021,2	15166,3	24049,7	14286,4	11709,6	15951,9	22394,6
GDP	173608,4	191007,7	206083,9	237474,6	218005,3	245127,5	292918,7	269999,8
C	0,047	0,0839	0,0736	0,1013	0,0655	0,0478	0,0545	0,0829

Source: author's calculation based on SORS data

The capital ratio in the observed sub period had the highest value in 2008 (0.1013), while its lowest value was recorded in 2005, when it was 0.047. The average value of this indicator in the analyzed eight-year period was 0.070, which means that on average 7% of the GDP generated from agriculture was returned through investments.

Similarly, the capital ratio for the period from 2013-2020 had the highest value in 2019 (0.0885), while the lowest value was recorded in 2015, when it was 0.0565. The average value was 0.07, which means that 7% of GDP was returned through investments in the agricultural production process.

Table 4. Capital ratio (agriculture) for the period 2013-2020, in millions of RSD

	Year							
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
I	22258,5	19448,5	16377,9	20477,9	20702	24752,2	28551,2	21152,8
GDP	305519,7	302226,3	289704	308422	286315	321765	322560	349004
C	0,0729	0,0644	0,0565	0,0664	0,0723	0,0769	0,0885	0,0606

Source: author's calculation based on SORS data

Observing the values of the capital ratio at the level of the entire economy, i.e., agricultural activity for the total period 2005-2020, it was established that the average value of the capital ratio at the level of the entire economy is 0.16. In other words, it can be said that 16% of GDP was intended for investment in fixed assets. The rate of change, although it is positive and amounts to 1.2% for the observed period, is at a relatively little level, so no significant changes are to be expected in the following period.

On the contrary, the average value of the capital ratio of agricultural activity, for the period from 2005 to 2020, was 0.0690, which means that on average 6.9% of the GDP generated from agricultural activity was invested in fixed assets related to agriculture. The rate of change of the capital coefficient related to agricultural activity for the observed period is at a slightly higher level and amounts to 1.7%. However, the stated rate of change is also at a relatively low level, so taking into account the data from the previous period, significant increases in the future are not to be expected.

Conclusion

The conducted research indicates that the agricultural activity in the Republic of Serbia contributed on average to the creation of the total GDP with 7.33%, while the share of investments intended for agricultural activity is at the level of only 3.12% of the total investments. The average value of the capital ratio specific to agricultural activity was approximately 2 times lower than the capital ratio at the economy level.

To this extent, it was shown that agricultural activity creates a far greater production value than is returned to it through investments in fixed assets. In addition, agricultural activity shows positive results that are reflected in the creation of new value and the achievement of absolute growth. However, the calculated capital ratios indicate that GDP is growing in absolute terms, regardless of how much was invested in agricultural production in the previous period. The obtained results related to the low capital coefficients in agricultural production indicate that in the future there may be a lag and a decrease in the participation of agriculture in the creation of GDP, not only due to the increase in economic activities from other sectors, but also because off minor investing in agriculture.

The growth in the value of agricultural production, which is not supported by significant allocations in the form of investments, can be explained by the permanent development of production technology on a global level, on the basis of which higher values are realized per unit of capacity. The above indicates that there is capacity for additional improvement and the achievement of even better production results if the investments were directed towards improving efficiency and achieving greater productivity, which implies investments in more modern machinery, the adoption of new technological solutions, as well as the improvement of the vertical ally between crop and livestock production, which ultimately results in the development of primarily livestock production. However, we must point on capacity of agriculture in Republic of Serbia to receive additional investments, considering the very features and functions of this activity. Regarding the factors of production used in conventional production, there is no significant difference compared to countries with developed agriculture, which leads us to the conclusion that it is necessary also to invest in the education of personnel responsible for the production and organization process.

The growth of GDP, which was accompanied by a decrease in the share of the value of agricultural production in the total realized GDP, indicates that the agricultural activity is not directly responsible for the growth of the overall economic activity, but the merits belong to other activities that belong to the secondary and tertiary sectors and which are obviously increased their activity and thus contributed to the growth of the total GDP. From all of the above, it can be said that the research hypothesis is partially accepted, and that is in the part where it is proven that the agriculture of the Republic of Serbia is not invested as much as it participates in the creation of new value. Bearing in mind that GDP generated from agriculture is growing despite lower capital ratios, it can be said that in this part the research hypothesis is partially rejected. Investments are not the only factor that affects the development of agriculture and there is a presence of technological progress that consists of the adoption of new technologies, technological procedures, increased productivity... as a result of transferring from other sectors, which does not require direct investments in agriculture itself.

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Conflict of interests

The authors declare no conflict of interest

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