Finance, Accounting and Business Analysis
Volume 2 Issue 1, 2020
http://faba.bg

Influence Analysis of The Active Part of Human Resources on The GDP of The Level 2 Regions in Bulgaria

Tanakow Nikola*, Tsolov Georgi

Department of Regional Development, University of National and Word Economy, Sofia, Bulgaria

Info Articles

History Article:
Submitted 23 January 2020
Revised 4 March 2020
Accepted 17 May 2020

Keywords:
Regional development, GDP per capita, unemployment, economically active persons, regional economy, region.

Abstract

This report focuses on the impact of human resources on the GDP of Level 2 regions in Bulgaria. The problems of unemployment and economically active population in Bulgaria are developing a centralized policy by the Ministry of Labor and Social Policy (MLSP). However, we believe the increase in GDP per capita is crucial for the development of regions and requires a comprehensive approach in its analysis. The report aims to analyze the problems of GDP per capita, some of them can be addressed regionally through forms of competitive advantage for economically active people. The report presents the spatial characteristics of the peculiarities of the regions. The author's team outlines the relevant positive aspects of the development of the regions in Bulgaria and their advantages and disadvantages.

Address Correspondence:
E-mail : nikolatanakov@gmail.com

INTRODUCTION

In the context of the second EU membership program for our country, the 6 NUTS 2 regions in Bulgaria face several new challenges. They build competitive industries and structures that will strengthen regional markets and will create opportunities for the sale of local products and services. In the process of achieving the Europe 2020 Strategy goals and objectives, countries with a well-developed regional economy demonstrate good practices and models based on state involvement in building viable local industries and innovative business associations (Nikolov, 2016). That is how we need to take the concept of the role of the economically active population as part of national human resources to an entirely new level.

The management practice in Bulgaria has established the regional policy as one of the most dynamically developing areas in the last few years. Following the country's accession to the EU, a regulatory framework and an institutional structure were created, which gained experience in the process of planning and coordination across sectors.

We have created real prerequisites for conducting a modern regional development policy by adopting and gradually supplementing the Regional Development Act and the related by-laws. The administrative approach, of Pan-European importance, applied in our country to this complex matter, has led to the development of many strategies and plans for expansion at different levels. They were originally summarized in the National Development Plan (2007-2013), and today they are being upgraded through the current National Development Program "Bulgaria 2020".

However, by applying a Systematic and Functional approach, we will recognize that the need for regional development policy is conditioned by the fact that the principle of territorial solidarity and cohesion requires the creation of relatively sustainable and equitable living conditions in different parts of the country. The availability of a unified strategic documents does not automatically lead to overcoming existing disparities and differences within and between regions. Their specific problems create social and economic confusion that can quickly affect the national economy to which they are closely linked.

On the other hand, a well-known fact is that market forces alone cannot ensure balanced regional development. Regional development is a new concept that aims to stimulate and diversify economic activities, incite investment in the private sector, contribute to reducing unemployment, and, last but not least, is a concept that should lead to an increase in the standard of living of the population. Scientific interest and practical results show that contemporary regional development can only be realized through conscious action and active participation of society. Efforts should be directed to coordinating and regulating the processes taking place in each territory in order to harmonize them and create sustainable conditions for work, life, and recovery of the population (Nikolov et al., 2019). The development of public well-being is mostly a result of the qualitative characteristics of the workers and is realized by increasing the efficiency of social production. Therefore, in a market economy the managers of an enterprise should strive to run efficiently the flow of material and financial resources; the deliveries and distribute properly the working capital (Hristozov, 2017).

Theoretical statement of the study

Official economic and social data[1] clearly show that in the current socio-economic situation we can recognize an urgent need for state economic policy in Bulgaria to further focus on more active and directed support for the development of the regions. This gives us a reason to analyze the relationship between the centrally conducted socio-economic policy in the country and the economic performance of the individual regions represented by the GDP per capita indicator. The authors of the report aim to enrich the research toolkit and methodology of evaluations to support the introduction of effective measures and guidelines for raising GDP per capita in the six regions in Bulgaria.

The subject of this analysis is the impact of two main categories of human resources - the "active population" and the "unemployment rate" on GDP per capita. The impact was verified in the six NUTS 2 regions of the country - Northwest, North-Central, Northeast, Southeast, Southwest and South-Central. The relationship between the variables is examined by analyzing data from official national statistics for 12 years (2007 to 2018), that we initially processed on a multiple regression model:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + u_i$$

Where:

Y_i – GDP per capita for the i-th region;

X_{1i} – active population in the i-th region;

X_{2i} – unemployment rate in the i-th region;

u_i – random component.

[1] Only official data from the National Statistical Institute (NSI) was used in the Report.

This model allows us to evaluate what is the impact of each factor (X) on the outcome (Y).

After correct examination of the models in the different regions, it turned out that in none of them the factor "unemployment rate" shows statistical significance. The authors have removed this factor from the analysis, and we based it on the following single-factor model:

$$Y_i = \beta_0 + \beta_1 X_{1i} + u_i$$

Where:

Y_i – GDP per capita for the i-th region;

X_{1i} – active population in the i-th region;

u_i – random component;

The research task of the authors of the report under these objective conditions is to identify the main problems marked by the negative or positive processes in the dynamics of the active population in the regions and their effects on the GDP per capita indicator..

An empirical statement of the study

Our original intention was to clarify the impact of the factors "unemployment rate" and "active population" on a key regional policy indicator - the GDP of the region. It was dictated by the ability to make several policy evaluations in the respective territorial community. The correct statistical processing of the data led to the need for the authors of the report to analyze in particular the data on the regional economic activity of the population and its impact on GDP per capita. The empirical study covers the dynamics of activity in different periods of economic booms and crises of regional development and the national economy. The results for the different regions are examined separately:

North-Central Region

The best model here is the quadratic model (Rsquare = 0.702). However, to ensure the adequacy of the estimated relationships, the authors choose to apply the linear model, according to the rule that the best model exceeds the linear model by more than 10% explanatory ability (Bozev et al., 2019) should be selected (Rsquare = 0.664). The linear model is adequate (Sig. = 0.001) and has the following graphic image and estimated form:

Table 1. Baseline data for the North-Central region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	10,7	50,3	5 848
2008	8,5	50,2	6 577
2009	8,4	49,3	6 523
2010	11,6	49	6 435
2011	12,8	49	7 416
2012	14,3	50,1	7 779
2013	15,3	50,5	7 925
2014	13,2	50,6	8 336
2015	10,6	51,2	8 635
2016	9,3	51	9 129
2017	6,9	51,5	9 865
2018	6,7	51,9	10 654

Source: NSI, 2020

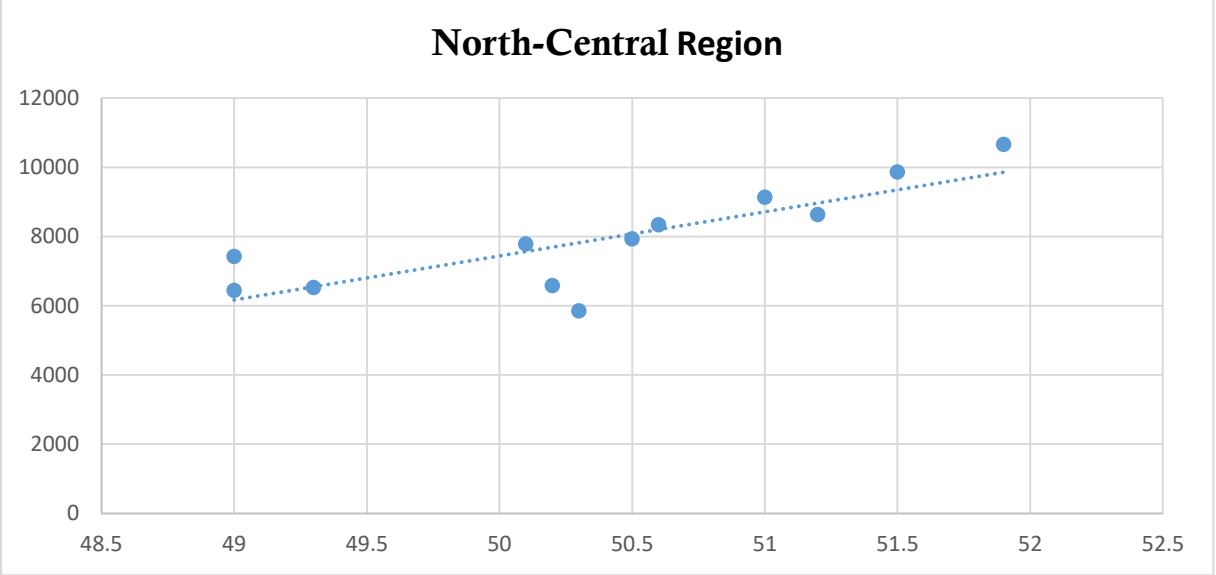

Figure 1. Dynamics of the active population in the region

Estimated form:

$$Y_{North-Central\ Region} = -56297 + 1275.X_{1North-Central\ Region}$$

The constant (Sig. = 0.003) and the parameter (Sig. = 0.001) are statistically significant and can be interpreted.

The estimated model shows that with one percent increase in the active population, GDP per capita in this region would increase by BGN 1 275.

North-East Region

The best models here are the cubic, quadratic, logarithmic, and linear models (Rsquare = 0.406). However, for the reasons outlined above, the linear model (Rsquare = 0.406) will again be applied to the selected model. The linear model is adequate (Sig. = 0.026) and has the following graphic image and estimated form:

Table 2. Baseline data for the North-East region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	10,8	54,5	7 110
2008	8,6	55,3	8 259
2009	10,4	53,9	7 943
2010	14,6	54,4	7 971
2011	15,4	53,5	8 951
2012	18,2	54,3	9 323
2013	16,8	54,6	9 316
2014	12,6	54,8	9 778
2015	10,3	55,9	10 246
2016	9,7	55,1	10 717
2017	9,4	57	11 525
2018	7,4	55,4	12 506

Source: NSI, 2020

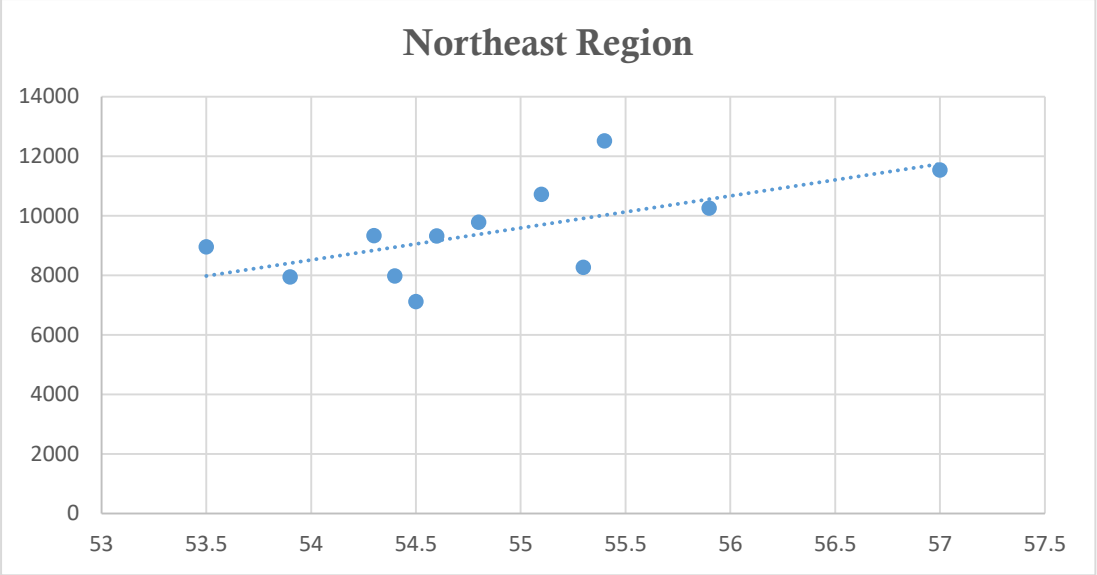

Figure 2. Dynamics of the active population in the region

Estimated form:

$$Y_{cortheast\ Region} = -49591 + 1076.\mathrm{X}_{1Northeast\ Region}$$

The constant (Sig. = 0.053) is not significant, but more importantly, the parameter before the factor variable is significant (Sig. = 0.026) and can be interpreted.

The estimated model shows that with a one percent increase in the active population, GDP per capita in this region would increase by 1,076 BGN.

South-East Region

The best models here are the cubic and quadratic models (Rsquare = 0.691). However, for a selected model to evaluate the relationship, the linear model will again be applied according to the rule that the best model exceeds the linear model with more than 10% explanatory power to be selected (R square = 0.690). The linear model is adequate (Sig. = 0.001) and has the following graphic image and estimated form:

Table 3. Baseline data for the South-East region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	6,5	50,5	6 735
2008	5,8	51,9	7 864
2009	6,6	51	8 019
2010	10,5	53	8 115
2011	11,5	52,3	8 931
2012	11,9	52,9	9 400
2013	13	52,3	9 509
2014	11,9	51,9	10 012
2015	10,4	52,7	10 312
2016	7,9	52,5	11 755
2017	7	54,8	12 655
2018	5,4	54,7	12 787

Source: NSI, 2020

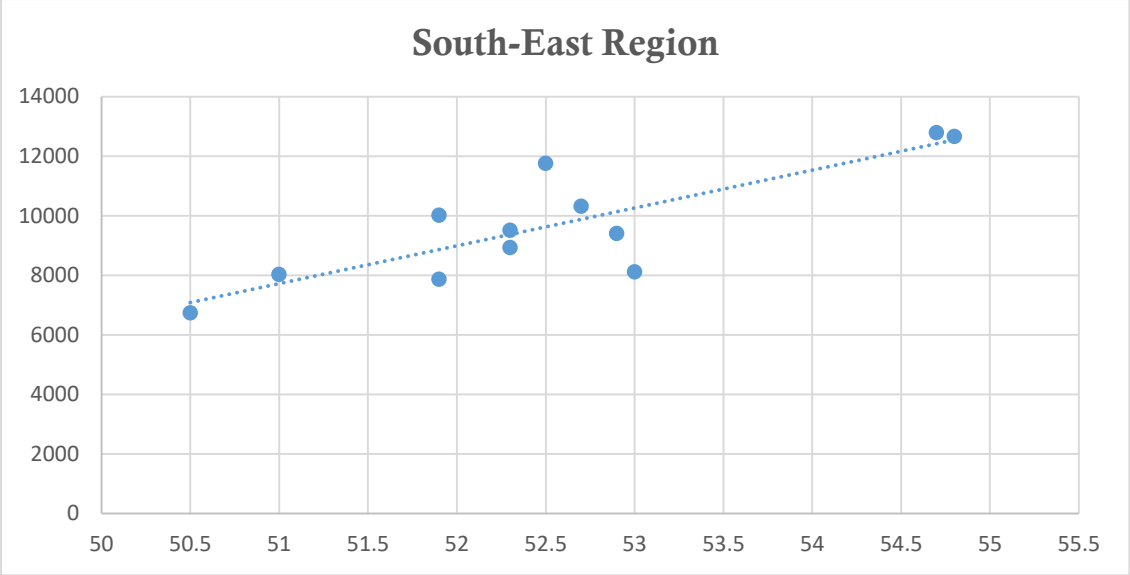

Figure 3. Dynamics of the active population in the region

Estimated form:

$$Y_{South-East\ Region} = -57067 + 1270.X_{1South-East\ Region}$$

The constant (Sig. = 0.002) and the parameter (Sig. = 0.001) are significant and can be interpreted.

The estimated model shows that with a one percent increase in the active population, GDP per capita in this region would increase by BGN 1,270.

South-Central Region

The best models here are the power, exponential, s-shaped, compound, and growth models (Rsquare = 0.390). Again, to evaluate the relationship, the authors choose the linear model according to the rule that the best model exceeds the linear model by more than 10% explanatory power to be selected (Rsquare = 0.387). The linear model is adequate (Sig. = 0.031) and has the following graphic image and estimated form:

Table 4. Baseline data for South-Central region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	5,6	51	5 943
2008	5,1	52,7	6 646
2009	7,3	51,8	6 754
2010	11,5	51,8	6 892
2011	12,9	50,7	7 665
2012	13,8	52,1	7 979
2013	13,5	54	7 940
2014	12	54,9	7 874
2015	9,2	53,1	8 756
2016	7,1	52	9 290
2017	5,2	55,3	10 076
2018	4,2	54,3	10 988

Source: NSI, 2020

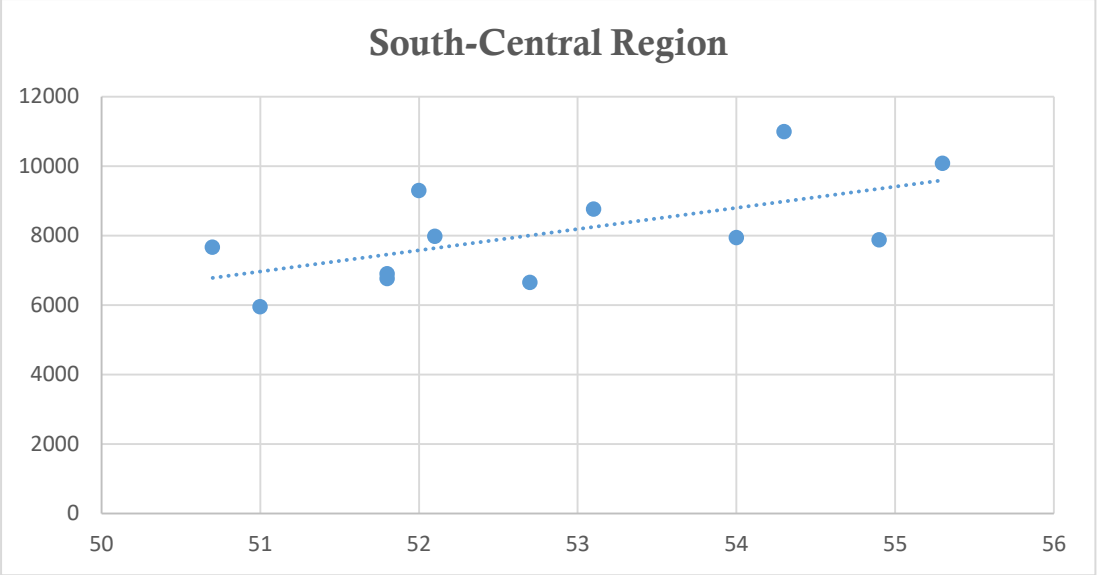

Figure 4. Dynamics of the active population in the region

Estimated form:

$$Y_{South-Central\ Region} = -24238 + 612.X_{1South-Central\ Region}$$

The constant (Sig. = 0.089) is not significant, but more importantly, the parameter before the factor variable is significant (Sig. = 0.031) and can be interpreted.

The estimated model shows that with a one percent increase in the active population, GDP per capita in this region would increase by BGN 612.

North-West and South-West

In these two regions, the authors found no statistically direct correlation between the "active population" factor and the GDP per capita indicator. None of the 11 models tested proved adequate to describe their relationship. Graphic expressions also do not show a clear link between them:

Table 5. Baseline data for the Northwest region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	9	46,4	5 551
2008	7,1	47,9	6 224
2009	8	46,6	6 087
2010	11,2	46,4	6 060
2011	12,8	45,7	6 941
2012	12,3	45,1	7 019
2013	14	46,7	7 034
2014	14,2	46,9	7 415
2015	12,1	46,6	7 599
2016	10,6	44,5	8 078
2017	11,3	47	9 048
2018	11,2	47,8	10 244

Source: NSI, 2020

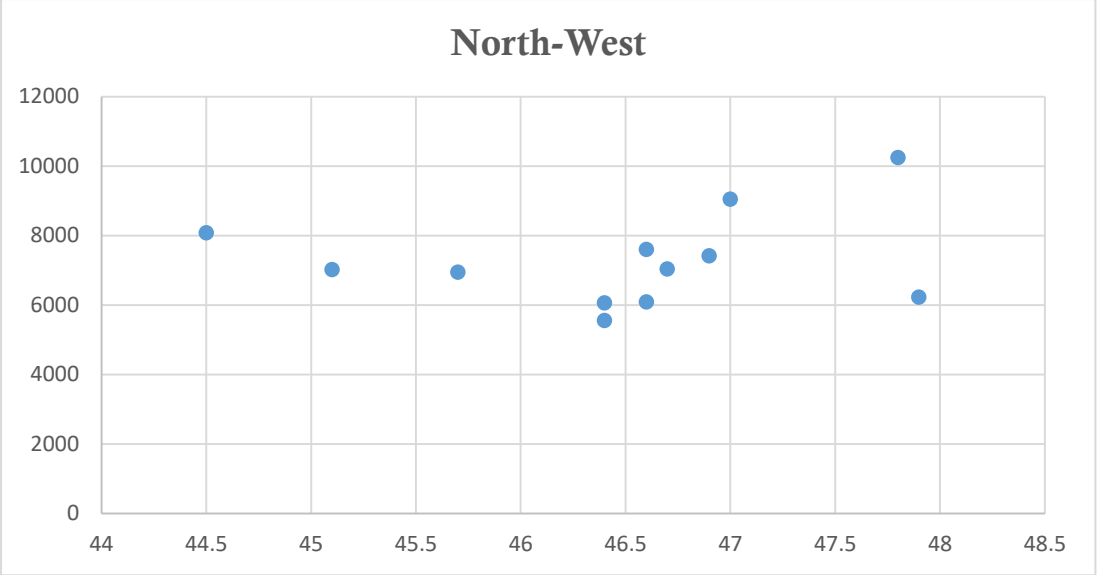

Figure 5. Dynamics of the active population in the region

Table 6. Baseline data for the Southwest region of NUTS 2 of Bulgaria

years	Unemployment rate (%)	Active population (%)	GDP per capita (in BGN)
2007	3,9	57,7	13 665
2008	2,9	59,1	15 919
2009	4,1	59	16 284
2010	6,9	58,9	16 933
2011	7,5	57,5	18 253
2012	8,2	57,6	18 341
2013	9,8	58,4	18 277
2014	8,9	58,5	18 634
2015	6,7	58,4	20 268
2016	5,4	58	21 572
2017	3,3	59,5	23 295
2018	2,6	60,3	25 261

Source: NSI, 2020

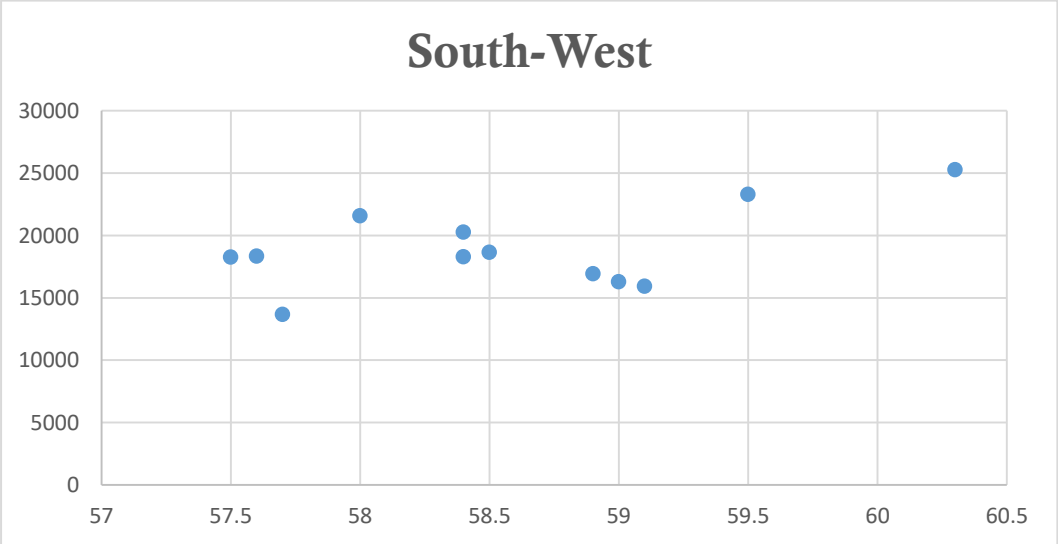

Figure 6. Dynamics of the active population in the region

Comparing the empirical results obtained, it can be reasonably concluded that, at a regional level, the active population exerts the greatest effect on GDP per capita in the North-Central region, and the least effective in the South-Central region. However, it is not these data that cause the greatest interest in the present analysis. The authors are puzzled by the fact that the Southwestern region, which is the richest region in the country (including the capital Sofia), cannot express the much sought after a statistical link between the active population and GDP. The result is the same in the Northwestern region, although it is the poorest and lagging region in economic and social terms. The mere fact that the statistical models used in the survey did not work in the two regions located at the extremes of the socio-economic pendulum (the richest and the poorest)[2] make us accept that the chosen approach is adequate.

Cross-regional comparisons

To build sustainable regional production systems to enhance the competitiveness of our national economy in the European and global markets, we need a detailed analysis of regional GDP and a clear idea of how different factors affect it. Logically, after trying to evaluate the correlation between the factors "unemployment rate" (for which we have not found statistically significant relationships) and "active population" (statistical estimates are presented above) by individual regions, we also need to make some cross-regional comparisons:

Within the EU, Bulgaria has long-term GDP, which is the lowest indicator of GDP in the other Member States. The pace of development shows that it will take more than 15 years for us to catch up with the average EU GDP standard. Therefore, the authors of the report compare GDP per capita by region from before Bulgaria joined the EU and after 12 years of EU membership.

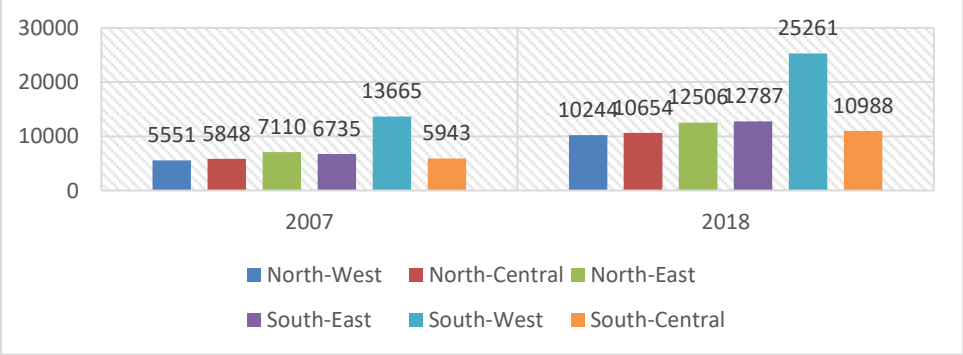

Figure 7. GDP per capita by region in the country - comparison between 2007 and 2018 (in BGN*)*

The results are obtained after processing the data with the SPSS statistical program and it is noticed in Fig. 7 that the 6 regions of NUTS 2 in Bulgaria have increased their GDP almost twice during the period of EU membership. This is undoubtedly due to market opportunities offered by the Union, the impact of the European Structural Funds on socio-economic development, attracting foreign direct investment, the gradual formation of the national capital, and the increase in entrepreneurial activity among Bulgarians.

In the same way, we should look at and compare the status of the economically active population by region in the country, again setting the 2007 figures as a baseline.

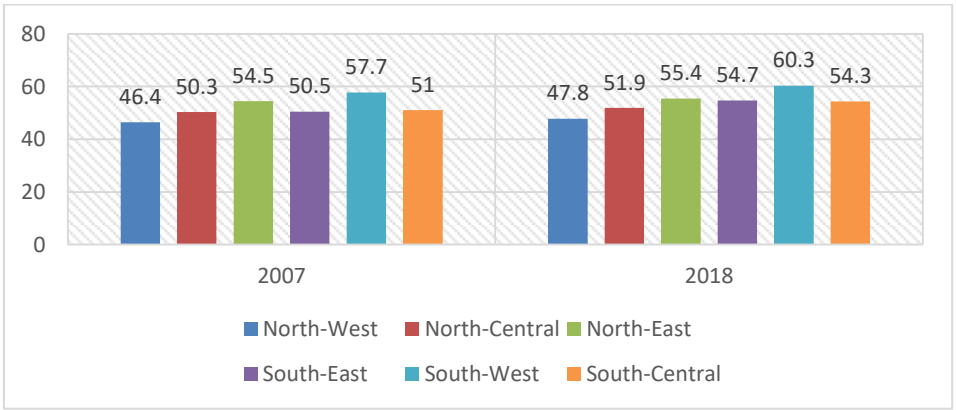

Figure 8. State of the economically active population by region in the country - comparison between 2007 and 2018 (in%)

[2] www.nsi.bg – NSI official website. See the Regional Statistics section.

The picture presented in Figure 8 also shows the percentage increase of the active population in the 6 regions of NUTS 2 in Bulgaria. In both cases, the Northwest region has the lowest index (1.4% growth for 12 years) and the Southwestern region has the best indicator (2.6% growth for the period). The highest change was observed in the values of the South-East region (4.25%), and the lowest change was observed in the values of the North-East region (0.9%).

CONCLUSION

Without claiming absolute exhaustiveness and comprehensiveness, the above estimates of the effect of the dynamics of the active population on GDP per capita in the individual regions and the inter-regional comparisons allow us to conclude the necessary state measures supporting regional development in Bulgaria. Since the report was written in the context of the crisis caused by COVID-19, that will undoubtedly lead to a restructuring of the economy on a regional, national, European and global scale, the authors of the report recommend that the following conclusions be taken into account:

Shortly, regions will develop their economic potential without much link to their unemployment rate. This is due to the widespread introduction of new technologies in the production of goods and services for final consumption and the replacement of human labor by machine. This condition can be offset by the targeted involvement of people in developing local resources by seeking new approaches to them.

Social capital in the regions will be judged the most by its quality indicators - education, skills, competences, creativity and innovation. The use of these personality features in the economic system gives businesses a chance to survive in the fast-changing environment and they will build their localization strategies according to the availability of such capital. Knowledge acquisition and development systems need to be deployed extensively regionally.

The management of spatial and territorial processes can only be effective if it also engages the public's attention. People determine the needs and priorities of the region, and the state creates the conditions to accumulate the necessary resources to meet them. A regional policy cannot be budget based but should stimulate the creation of effective self-developing instruments - regional funds, free industrial zones, guaranteed municipal and district loans, bond issuance, and more.

Achieving sustainable employment in the regions should be a top priority. The approach used by the authors shows that, despite the contingencies in the analysis, it can be argued that there is a relationship between the percentage of the active population in the regions and the amount of GDP in them. In the future, many other factors affecting GDP per capita in the territorial units of the country will be subjected to statistical analysis, but cross-regional comparisons suggest that long-term growth in the active population is achieved by expanding entrepreneurship and creating new forms and business organization.

REFERENCES

Goev, V., Boshnakov, V., Tosheva, Ek., Haralampiev, K., Bozev, V. (2019). Statisticheski analiz v sociologicheski, ikonomicheski i biznes izsledvaniq. Publishing House – UNWE. Sofia. pp. 181

Nikolov, G. (2016). Durjavni politiki I strategii za regionalno razvitie. Publishing House – UNWE. Sofia. pp. 7-9, (94)

Nikolov, G. et. al, (2019). Regionalno I prostranstveno razvitie na gradovete ot Severozapaden rayon, Severen centralen I Yujen centralen rayon. Publishing House – UNWE. Sofia. pp. 3-5, (196-198), (432-434)

Hristozov, Yanko. How to Manage the Liquidity and Fight the Firm Debt. International Business and Accounting Research Journal 2.1 (2018), pp. 23-33.