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https://doi.org/10.62900/BHEF242002005

USING PROJECT FUNDING FOR ADVANCING REGIONAL COMPETITIVENESS

ABSTRACT

The idea that regional competitiveness can be fostered and managed to enhance national competitiveness has gained increasing acceptance in the scientific community in recent years. Based on this, several initiatives have been developed and implemented to enhance the company's competitiveness in specific target regions of Europe and Bulgaria through targeted project financing. Many authors develop and improve methods for assessing a company's competitiveness by concentrating on specific components such as marketing and market management, innovation and entrepreneurship, leadership in human capital management, and more. Based on this, various nations create and carry out financial initiatives to enhance business competitiveness; unfortunately, the impacts of these initiatives have not been the focus of economic or social research. Accordingly, the primary goal of this paper is to investigate and evaluate the concept of Total factor productivity model (TFP) on (regional) competitiveness as well as to examine the impact of project funding on regional competitiveness by comparing the project –based fields and importance of regional competitiveness drivers (RCI). The analysis indicates that regional competitiveness is not directly correlated with national competitiveness, as regional governments must implement targeted competitiveness policies. Ultimately, as illustrated by the Kardzhali example, local governments should more effectively investigate the factors influencing regional competitiveness rather than concentrating solely on national aspects. The limitation of this paper is that regional competitiveness is calculated only for a single NUTS region in Bulgaria, in comparison to national competitiveness data.

Keywords: *Regional competitiveness, competitiveness funding, regional competitive advantages.*

JEL: *L52; O44; O47*

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1. INTRODUCTION

Undoubtedly, the problem of regional competitiveness has arisen in recent days as different regions "develop their economic and social growth" differently based on differences in their economic growth speed. Some of the reasons stated in some research are differentiation in economic potential based on human resources, innovation, and entrepreneurship, as well as free access and intra-regional movement of economic and social players. Just for example, it is not a new idea that Europe is divided into 3 or 4 different regions within different economic growth speeds.

Additionally, the focus of the main research on competitiveness is mostly on the national (macroeconomic) conditions of competitiveness. So, they could easily have missed a slight change in intra-regional competitive advantages that would force a bigger change in the national competitiveness index in the future. Furthermore, national economic and social strategies could not be effective just because they do not use regional competitive advantages, and the project financing does not force expected economic and social results. For example, financial projects for keeping a quality labor force in a certain region could harm the labor market and labor productivity on labor prices but could not help change the outflow of high-quality workers.

Based on the literature preview, the paper's methodology is based on regional competitiveness models and involves the use of micro-data for Bulgarian companies and macro-analysis of the overall impact on regional competitiveness indices. The dataset is from Bulgaria and includes information from the official register of the funded projects for competitiveness, covering various elements of the national competitiveness index and business competitiveness indices, as well as project financing. The results explain the deepening regional disparities in their competitiveness in Bulgaria.

2. LITERATURE REVIEW

Regional competitiveness has become more and more popular in recent days in response to the local changes in the social, economic, and political environment, especially forced by the pandemic lockdowns and local crises. Basically, the arguments for regional competitiveness are stacked within the "locked" potential of single regional competitive advantages within and over the local crises.

A good example for the regional competitiveness definition is found in Bras et al. (2023), as they research the impact of universities on regional competitiveness, and their thesis is found in a bundle of researches for academic entrepreneurship potential (Sterev, 2023).

Although there is no single definition for regional competitiveness (Aiginger 2006; Bristow 2005; Gardiner et al. 2004), most of the existing ones make links between firm competitiveness, local/regional competitiveness, national competitiveness, and international competitiveness. And, not surprisingly, not just the basics of regional competitiveness but its formation as well is similar to the other levels of competitiveness research. For example,

- Gardiner et al. (2004) connect the regional competitiveness with the attraction of investments and other resources (human capital) as well as government incentives (and their funding).
- Another perspective is found in markets (products, labor, etc.) and the ability of local or regional companies to expand markets based on higher productivity, resource efficiency, or to attract highly paid workers (see Porter, 2002, and others).
- Third point of view: connect competitiveness with growth and economic development. Based on Perry (2010) and Fernandez et al. (2013), regional competitiveness is measured by economic success (economic growth, economic income, or welfare of living).

Nevertheless, there are studies that do not make sense between regional/local and national competitiveness, as the general definition of competitiveness is "the ability of companies, industries, regions, nations, and supranational regions to generate, while being exposed to international competition, relatively high income and employment levels" (Bras et al., 2023).

Oppositely, Annoni and Dijkstra (2019) proposed the Regional Competitiveness Index (RCI) based on Dijkstra et al.'s (2011) definition of regional competitiveness: the ability of a region to offer an attractive and sustainable environment for firms and residents to live and work, balancing the goals of commercial success with personal well-being.

Analyzing the construction based on regional competitiveness, some major factors of this construct could be found:

- Entrepreneurial support measures, international collaboration, funding strategy, and organizational design (Bras et al., 2023)
- R&D level, human capital, physical capital, agglomeration economies and regional specialization, leadership, and (regional) institutions (Kovács et al., 2023). It is based on the TFP model for regional industry growth (Lengyel, 2017 and others).
- International trade, human capital, entrepreneurship, and innovations (Krstić & Gawel, 2024)
- Innovations (Halásková and Bednář, 2023; Santa-Cruz et al., 2024)

- Academic entrepreneurship (Sterev, 2023; Yordanov, 2023)
- environmental factors of regional climate change/CO_2 emissions, emissions of sulfur oxides/, economic factors/investments share, access to funding, R&D expenditures/, innovative factors/international scientific publications, bird rate/; social factors/people at risk of poverty, migration, population density/; technological factors/digital skills, access to technology/ (Karman et al. 2023)
- Education, Job, Economic Wellbeing, Territory and Environment, Entrepreneurship, Innovation, Infrastructures, and Mobility (Scaccabarozzi et al., 2024)
- Economy; Labor Market; Poverty and Social Exclusion; Health; Education; Environmental and Energy; Transport; Technology/Science and Digital Society; High-tech Industry; and Innovation Kouskoura et al., 2024)

Furthermore, the direct connection between public investments by project financing and regional competitiveness is not studied as most of the researches are focused on one or limited number of factors. For example, Kozioł-Nadolna (2016) advancing regional competitiveness by innovation project funding; Erceg and Kukec (2017); Gabriela (2017); Anindyaswari, and Wijaya (2020); Galko et al. (2015) and others focus of entrepreneurial micro-financing tools for better competitiveness.

Depending on the regional competitive advantages, the role of financing for regional competitive success is found in different business project financing. For example, Levchenko, et al. (2018) and Adamchyk (2020) found application of project-based approach in tourism as appropriate instrument ensuring (regional) competitiveness; Bachev (2023) and Kabakchieva (2020) define critical governance aspect of the agriculture farm's competitiveness. Other researchers are focusing on approaches to the financing of transport infrastructure (Nykyforuk, 2014); fintech industry (Bîzderea 2017), waste management (Hajdys and Kogut-Jaworska, 2018) and etc.

Nevertheless, the overall effect of public financing and competitiveness is found by analyzing EU project funding and its primary results in different countries. For example: Romania (Gherghinescu, 2012; Mircea, 2011; Abalașei et al. 2022), Poland (Kłos, 2011), Latuania (Gasparėnienė and Remeikienė, 2016), Bulgaria (Stoyanova and Sterev, 2018) ant etc.

Finally, all of the given regional competitiveness drivers could be found to be a part of different regional policies, such as the strategy of EU cohesion or the strategy for smart specialization (S3) (Fratesi and Wishlade, 2017; Parente, 2019; Shterev, 2020; and others). For example, as Bras et al. (2023) found, entrepreneurial supporting measures as well as funding strategies have a positive impact on regional competitiveness; Fehér at al. (2010) analized financial support grants in agriculture for higher competitiveness, and etc.

3. RESEARCH MODEL

Although different approaches to research the regional competitiveness have been used in practice, we could easily identify 3 regional competitiveness models:

- Total factor productivity (TFP) model based on input-output-outcomes analysis. The model usually explains the dependence of some outcomes (for example, GDP, GDP per capita, net income, etc.) by direct drivers of (firm, regional, or national) competitiveness (for example, innovations per employee, entrepreneurial outcomes, R&D expenditures, motivation level, etc.) and/or indirect drivers as competitiveness infrastructure (for example, poverty and social inclusion, average salary, digitalization, etc.).

  Typically, the TFP model is presented by the dependence function (Formula 1) of its first or second derivative (Formula 2) (see Bras et al., 2023).

$$RCI_i = \alpha_0 + \alpha_1 IP_i + \alpha_2 ESM_i + \alpha_3 IC_i + \alpha_4 FS_i + \alpha_5 OD_i + \mu_i \quad (1)$$

  Where, RCI – regional competitiveness index,
  $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ - dependence ratio of different drivers
  μ_i - errors representation

$$\Delta(RCI_i) = \beta_0 + \beta_1 \ln(IP_i) + \beta_2 \ln(ESM_i) + \beta_3 \ln(IC_i) + \beta_4 \ln(FS_i) + \beta_5 \ln(OD_i) + \varepsilon_i \quad (2)$$

  The competitiveness model could be explained by the rank of dependence. For example, Kovács et al. (2023) presented a pyramid competitiveness model to inform about the development of the determinants of economic viability and self-containment for geographical economies. Its mathematical approach explains why the model has the most attention in academic and policy circles and offers the most opportunities for a diverse research agenda.

  Similar approach is used by Nazarov (2012) as he applies dialectical and synergistic approach to study of the region's competitiveness by usage of a systemic cognitive model. He applies TFP differential model as a dynamic system research instruments including 4 separate models for: production factors, endogenous factors, business climate factors and regional technology level.

- Single model of regional competitiveness based on simple factor—reaction dependence (see Halásková and Bednář, 2023). The model usually uses just one or two competitiveness drivers that change the competitiveness over

time (Formula 3) (for example, one driver from Formula 1), and results could benefit policymakers in regional systems to increase regional performance and, thereby, the competitiveness of the given regions.

$$\Delta RCI_t = \alpha_0 + \alpha_1 (IP_{it} - IP_{t-1}) + \mu_t \quad (3)$$

The model explains variation of the regional competitiveness over time and brings the role of the change of the given single driver for this change. The model could be used for any single driver, as explained in the previous section.

Similar approach of single factor econometric research, based on Innovation index (expenditures in research and innovations, and employed in research and innovation) and its impact on regional competitiveness is presented by Cismaș and Talmaciu (2017). By launching the model, they found that spending on innovation, research and development will attract investors, will diminish the massive departures of higher education graduates and increase the number of jobs that boost regional competitiveness.

- Single-region competitiveness model. It is focused on single regions and explains the role of the multi-factor dependence for its regional competitiveness. The model is based on a set of indicators covering different drivers (i.e., human, infrastructural, relational, settlement, or economic and entrepreneurial). For example, Orsi et al. (2024) explain how regional specifics emphasizes the endogenous development and regional competitiveness of particular territories.

Usually, the model is used within SWOT analysis and development scenario evaluation in order to test the regional competitiveness assessment model to apply the polycentric development scenario.

4. RESEARCH RESULTS

A single region competitiveness model is applied for one Bulgarian region at NUTS3—Kardzhali.

During the last 2 program periods for the EU, resp. 2007-22013 and 2014-22020, as part of the cohesion funds of the EU with partial national financing, a number of projects were financed under the Competitiveness Operational Program (the name is different for the two periods), with a total of over BGN 2 billion agreed. Unfortunately, economic and social analysis of the impact of these programs is lacking.

Accordingly, the author's thesis is that project financing in Bulgaria in recent years does not create the necessary prerequisites for increasing company and regional competitiveness. To verify the thesis, we use data on the regional competitiveness of the municipality of Kardzhali for 2010–2019 and compare it with the level of competitiveness of project financing for business companies in the municipality of Kardzhali.

For the period 2014-2020, 278 projects of 227 beneficiaries with a total value of BGN 30 million were implemented in the Municipality of Kardzhali, of which BGN 22 million were grant funding and BGN 8 million were self-financing (Table 1).

Table 1. Project financing in the Municipality of Kardzhali, 2014-2020

	number of projects (No)	total value (BGN)	financial support (BGN)	self-financing by the beneficiary (BGN)	amounts actually paid (BGN)
finished	249	25,937,519	19,339,098	6,598,422	19,250,072
in execution	28	1,943,055	1,312,825	630,230	7,150
discontinued	1	3,006,710	1,503,355	1,503,355	0
total	278	30,887,284	22,155,277	8,732,006	19,257,222

Source: EUMIS 2020, Council of Ministers, https://eumis2020.government.bg/

Compared to all implemented projects in the country, the municipality of Kardzhali is responsible for:

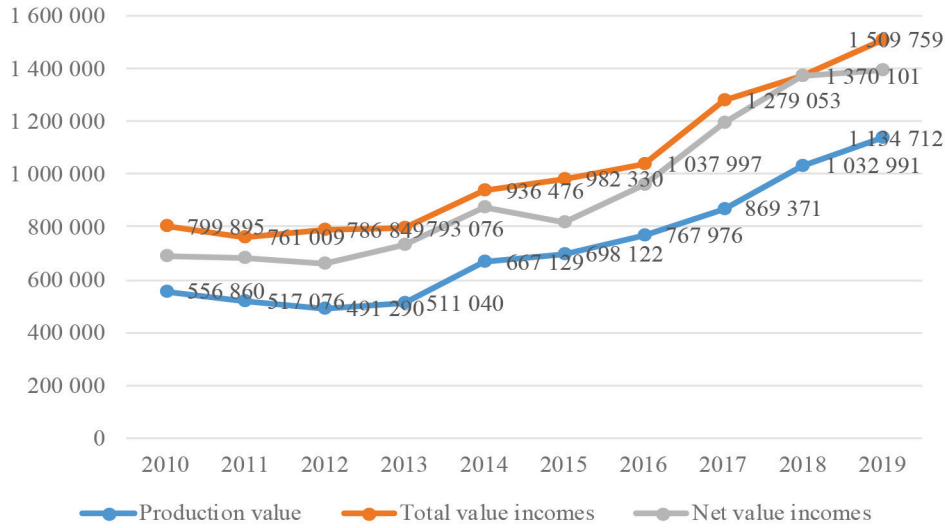
- 79% of all projects (a total of 35,330 funded projects)
- 75% of all beneficiaries (30,085 beneficiaries in total)
- 71% of the total project value (total BGN 4,374,099,560)
- 66% of the total grant funding (total BGN 3,381,367,139)

The figures show that the project financing is not properly distributed in the Municipality of Kardzhali in comparison to other Bulgarian regions.

BUT HOW IT EFFECTS ON THE REGIONAL COMPETITIVENESS?

First of all, we are looking at the competitiveness outputs: net income and Production value. (Figure 1)

Figure 1. Net income and Production value in the Municipality of Kardzhali, 2010-2019



Source: *(Bulgarian) National Statistic Office, www.nsi.bg*

Following the data from Figure 1, a permanent trend towards economic development is observed in the territory of the municipality of Kardzhali. The production for the period increased from BGN 556,860 thousand in 2010. to BGN 1,134,712 thousand in 2019. With the increase in production, the revenues of the enterprises also increased from BGN 799,895 thousand in 2010. to BGN 1,509,759 thousand in 2019. This determines the rising rates of the net revenues from sales realized in the territory of the municipality of Kardzhali. During the researched period, they grew more than twice (from BGN 688,731 thousand to BGN 1,395,592 thousand in 2019).

Analyzing major regional competitiveness drivers, we could find some reasons for the regional growth.

A. Entrepreneurship

The change of the entrepreneurship driver is measured by the number /change/ of the companies (Table 2).

Table 2. Active enterprises in the Municipality of Kardzhali, 2010-2019

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Active enterprises (No)	2 726	2 639	2 624	2659	1 702	2 775	2 990	3 017	3 075	3 126

Source: *(Bulgarian) National Statistic Office, www.nsi.bg*

To a large extent, some initial results of the implementation of the projects can be judged by the change in production and employed persons in the municipality, and the increase in these values can and should be taken as an initial signal of the increasing competitiveness of the region.

8The data from Table 2 show a steady increase in the number of non-financial enterprises, which is due to a favorable business climate in the municipality. The increase in the number of organizations is related both to the growth of the entrepreneurial activity of the local population and to the growing amount of foreign investments. During the research period, the investment climate and its attractiveness for foreign investments have significantly increased. International organizations positively evaluate the area and successfully develop their activities in it. A typical example here is TEKLAS-BULGARIA EAD, which provides employment to over 3,000 people from the municipality, as well as a part of local companies that are its main subcontractors.

B. Human capital

The change of the human capital driver is measured by the number /change/ of the employed people (Table 3)

Table 3. Employed in the Municipality of Kardzhali, 2010-2019

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
Employed people (No)	16091	15651	15784	15562	15891	16720	17150	17705	18173	17893

Source: *(Bulgarian) National Statistic Office, www.nsi.bg*

The number of employed does not increase as expected. This is due to the fact that newly opened enterprises from the non-financial sector are mostly micro and small enterprises. Another important reason is that the newly created enterprises with foreign investments are highly technological (for example, TEKLAS Bulgaria). In the middle of the period from 2015 to 2018, the largest growth in the employment of the population in the municipality was observed, after which the trend changed.

C. Foreign Investments

In recent years, the amount of foreign direct investment in non-financial enterprises in the Kardzhali region has been increasing, with the greatest credit to the municipality of Kardzhali. In 2017 they were 176,317 thousand euros, in 2018 -153,123.8 thousand euros in 2020 as well. 256,413 thousand euros. Their size is the largest in 2019—321,008.2 thousand euros. This speaks of built trust on the part of foreign investors and an attractive business climate.

Based on Formula 2, three models are tested (based on Kopeva et al. 2010): the standard Total Factor Productivity (TFP) function, which includes the following predictors: (Constant), Investments in Long-term Assets (A), and Personnel Costs (L); the Competitiveness TFP function, with predictors: (Constant), Active Enterprises (Ent), and Direct Foreign Investments (DFI); and the Employment TFP function, which includes predictors: (Constant) and Number of Employees (Empl).

$$\Delta(RCI_i) = \beta_0 + \beta_1 \ln(IP_i) + \beta_2 \ln(ESM_i) + \beta_3 \ln(IC_i) + \beta_4 \ln(FS_i) + \beta_5 \ln(OD_i) + \varepsilon_i \quad (4)$$

All three models are significant at the national level, but only the first two are significant at the Kardzhali NUTS 3 level (Table 4).

Table 4. Model check, 2005-2023

ANOVA Table /Bulgaria National Data/

Model	Sum of Squares	df	Mean Square	F	Sig.
Standard TFP function	243.407	2.000	121.704	11722.704	0.000
Competitiveness TFP function	230.518	2.000	115.259	5116.013	0.000
Employment TFP function	236.997	1.000	236.997	1259.481	0.000

ANOVA Table /Kardzhali NUTS 3 Data/

Employment TFP function	0.006	1.000	0.006	0.022	0.884
Competitiveness TFP function	3.284	2.000	1.642	67.836	0.000
Standard TFP function	4.379	2.000	2.189	179.494	0.000

Source: *(Bulgarian) National Statistic Office, www.nsi.bg*

Preliminary analysis indicates that the Total Factor Productivity function is validated at both the national level and the NUTS 3 Kardzhali level. Consequently, we can proceed with testing the impact of competitiveness factors: Direct Foreign Investments and Entrepreneurial Activity (see Table 5).

Table 5. TFP models, 2005-2023

Coefficients /Bulgaria National Data/
Dependent Variable: ln TFP

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
logDFI	0.494	0.0577	0.508	8.56	0.000
logEnt	0.528	0.0633	0.494	8.34	0.000
logL	0.696	0.0427	0.645	16.32	0.000
logA	0.366	0.0404	0.358	9.06	0.000

Coefficients /Kardzhali NUTS 3 Data /
Dependent Variable: ln TFP

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
logDFI	0.524	0.067	0.860	7.88	0.000
logEnt	0.231	0.199	0.126	1.16	0.265
logL	0.845	0.0799	0.825	10.57	0.000
logA	0.187	0.0752	0.194	2.49	0.024

Source: *(Bulgarian) National Statistic Office, www.nsi.bg*

The following conclusions can be drawn from the provided tables:

- The labor productivity is not a factor of competitiveness at the regional level in Kardzhali. Therefore, projects aimed at increasing employment in Kardzhali are unlikely to enhance regional competitiveness.
- The entrepreneurial activities also cannot be considered a significant factor for regional competitiveness in Kardzhali, as their overall impact on the Total Factor Productivity (TFP) function is half that of the national level.
- Finally, direct foreign investments are a significant factor in regional competitiveness, and their importance is greater than at the national level.

In summary, the applied analysis shows that competitive business is the main priority in the Plan for Integrated Development of the Municipality of Kardzhali. And although first positive results related to regional competitiveness are being reported, adequate local/regional policies to promote local/regional competitiveness are not yet in place at Kardzhali.

5. CONCLUSION

Undoubtedly, increasing company, regional, and national competitiveness should be a priority over economic and social policy in the country. To the extent that national measures and programs to promote competitiveness aim to develop Bulgarian business, there are known imbalances and geographical concentrations of successful and competitive businesses in individual regions (for example, Sofia, Plovdiv, Varna, and Burgas).

This puts the economic and social development of the rest of the country's regions in a difficult position. On this basis, regional competitiveness through the creation and development of networks of enterprises should be placed as a priority at the national and regional levels.

Accordingly, achieving a balanced and successful regional policy to increase regional competitiveness requires developing appropriate mechanisms based on targeted research to promote regional competitiveness. For example, the municipality of

Kardzhali realizes significantly fewer funds under the program for the promotion of competitiveness, as required by the policy of the Municipality of Kardzhali for priority development of the local economy based on competitive growth. And project financing lack in the Municipality of Kardzhali prevents development of appropriate specific regional measures to promote regional competitiveness.

Following the results, Kardzhali local authorities have to develop regional project-based financing instrument focused on innovations and entrepreneurial development in economic sectors with higher competitive advantage as: tourist sector, automotive industry and green agriculture. Thus, the local government will manage more effectively the drivers influencing regional competitiveness rather than to expect national public financing programs to boost the regional competitiveness of Kardzhali Municipality. Additionally, similar approach could be used within the regional competitiveness analysis of neighboring regions in Bulgaria, Greece and Turkey, and Kardzhali local authorities could apply project financing instruments for advancing regional competitiveness within inter-regional competitiveness drivers.

ACKNOWLEDGMENT

This research was supported by the UNWE-Sofia [grant number NID NI-4/2022/A].

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KORIŠTENJE PROJEKTNOG FINANSIRANJA ZA UNAPRIJEĐENJE REGIONALNE KONKURENTNOSTI

SAŽETAK

Ideja da se regionalna konkurentnost može podsticati i upravljati kako bi se poboljšala nacionalna konkurentnost dobila je sve veće prihvaćanje u naučnoj zajednici posljednjih godina. Na osnovu toga, razvijeno je i implementirano nekoliko inicijativa za povećanje konkurentnosti kompanije u specifičnim ciljnim regionima Evrope i Bugarske kroz ciljano finansiranje projekata. Mnogi autori razvijaju i poboljšavaju metode za procjenu konkurentnosti kompanije koncentrišući se na specifične komponente kao što su marketing i upravljanje tržištem, inovacije i preduzetništvo, liderstvo u upravljanju ljudskim kapitalom i još mnogo toga. Na osnovu toga, različite nacije kreiraju i sprovode finansijske inicijative za unapređenje poslovne konkurentnosti; nažalost, uticaji ovih inicijativa nisu bili u fokusu ekonomskih ili društvenih istraživanja. U skladu s tim, primarni cilj ovog rada je istražiti i ocijeniti koncept modela ukupne faktorske produktivnosti (TFP) na (regionalnu) konkurentnost, kao i ispitati uticaj projektnog finansiranja na regionalnu konkurentnost upoređivanjem oblasti zasnovanih na projektima i važnosti pokretača regionalne konkurentnosti (RCI). Analiza pokazuje da regionalna konkurentnost nije u direktnoj korelaciji sa nacionalnom konkurentnošću, jer regionalne vlade moraju provoditi ciljane politike konkurentnosti. Na kraju krajeva, kao što je ilustrovano primjerom iz Kardžalija, lokalne vlasti bi trebale efikasnije da istražuju faktore koji utiču na regionalnu konkurentnost umjesto da se koncentrišu samo na nacionalne aspekte. Ograničenje ovog rada je to što se regionalna konkurentnost izračunava samo za jednu NUTS regiju u Bugarskoj, u poređenju sa nacionalnim podacima o konkurentnosti.

Ključne riječi: *regionalna konkurentnost, finansiranje konkurentnosti, regionalne konkurentske prednosti.*

JEL: *L52; O44; O47*