ИКОНОМИЧЕСКИ ИЗСЛЕДВАНИЯ
ECONOMIC STUDIES

Volume 28 (1), 2019

Milkana Mochurova[1]
Mitko Dimitrov[2]
Stoyan Totev[3]
Taki Fiti[4]
Marica Antovska-Mitev[5]
Bojan Jovanovski[6]

INNOVATION ACTIVITY OF THE BUSINESS SECTORS IN THE BORDER REGIONS OF THE REPUBLIC OF BULGARIA AND THE REPUBLIC OF MACEDONIA

The paper argues that cross-border cooperation is important for border regions for building productive economies and inclusive societies. It justifies also the need of integrating sustainable development principles into regional development practice.
The paper analyses levels and dynamics of key socio- economic indicators of the Northeast Region of Macedonia and Kyustendil district in Bulgaria such as regional – GDP, gross value added, employment, economic structure, demographic indicators.
It concludes by presenting prospects for development of cooperation in the cross border regions.
JEL: R10; R58

Introduction

The research in this paper concerns the situation related to economic development and innovative activity of the businesses in the Kyustendil District of the Republic of Bulgaria (Kyustendil, Dupnica, Rila, Sapareva Banya) and Northeast Region of the Republic of Macedonia, more precisely in the Kratovo, Kriva Palanka, Kumanovo, Lipkovo, Rankovce, and Staro Nagoričane municipalities.

[1] *Milkana Mochurova, Assistant Professor, Economic Research Institute, BAS, +359 888-927-830, e-mail: m.mochurova@iki.bas.bg.*
[2] *Mitko Dimitrov, Professor, Economic Research Institute, BAS, +359-2-8104016, e-mail: m.dimitrov@iki.bas.bg.*
[3] *Stoyan Totev, Professor, Economic Research Institute, BAS, +359 886-193-874, e-mail: s.totev@iki.bas.bg.*
[4] *Taki Fiti, Academician, Prof, PhD, President of Macedonian Academy of Sciences and Arts, Prof. Ss. Cyril and Methodius University's, Macedonia, e-mail: fiti@manu.edu.mk.*
[5] *Marica Antovska-Mitev, Center for Strategic Research, MANU, e-mail: mantovska@manu.edu.mk.*
[6] *Bojan Jovanovski, Senior Lecturer (FH), University of Applied Sciences FH JOANNEUM, Graz Austria, phone: +43 (0)316 5453 6812, e-mail: bojan.jovanovski@fh-joanneum.at.*

Innovativeness, i.e. innovative business is being defined, in accordance with the already comprehended meaning of innovation as recognized by scholarly papers in the areas of economy and of entrepreneurship, as well as the Eurostat and the European Innovation Scoreboard methodology for innovative businesses. An enterprise is considered innovative if it has introduced at least one of the following four types of innovation: product / service innovation, process innovation, organizational innovation and marketing innovation.

The paper is structured in three parts. The first part refers to the analysis of the socio-economic characteristics of the two cross border (CB) regions. In the second part of the paper, the focus of the research is on the analysis of innovation activities of the enterprises from the two cross border regions. The third part of the paper consists of conclusions and recommendations for improving the innovative capacity of enterprises from both CB regions of the two countries.

1. Socio-Economic characteristics of the two Border Regions

Kyustendil District of Bulgaria

The Kyustendil district is one of the five NUTS 3 regions forming the Southwestern region of Bulgaria (NUTS 2 level). Specific for this region is the big difference between the districts – on the one hand, the highly developed metropolitan area – Sofia city district, and on the other hand, Kyustendil district, characterized by comparatively low economic indicators – both in terms of achieved level and dynamics of development. The administrative division of Kyustendil district comprises nine municipalities, the two largest Kyustendil and Nevestino being border with the Republic of Macedonia. The territory of Kyustendil region (NUTS 3 level – districts) is 3084 km^2, and the population of Kyustendil district represents only 1.76% of the population of Bulgaria in 2015.[7]

Achieving stable economic growth is the main challenge for Bulgarian regions, the development of which has been severely complicated in the last decade of the economic crisis. The weak economic starting positions of the Kyustendil district on the eve of the economic crisis further aggravated the overall socio-economic picture – the result is a relatively high slowdown of GDP growth compared to the country average rates and the ones of the most other districts.

The statistical evidence shows that Bulgaria's GDP growth (in current prices) in the Kyustendil District legs considerably against the average indicators for the country.

Some key indicators for the socio-economic development of Bulgaria, the Southwestern region and the district of Kyustendil for 2015, as well as their dynamics, are presented in Table 1.

[7] Republic of Bulgaria National Statistical Institute (NSI) -- http://www.nsi.bg/en and own calculations.

Table 1
Socio-economic data for Bulgaria, Southwestern region and districts of Kyustendil – 2015

	GDP per capita in 2015 – average for the country = 100%	Change of the share of GDP, 2015/2007, %	Productivity (GVA per employee) as a share of the average for the country 2014, %	Population density 2015, inhabitants per 1 km2	Mechanical growth in 2015, ‰	Total FDI for the period 2007-2014 – Bulgaria = 100%	Employment coefficient 2015, % (aged 15-64)	Unemployment coefficient 2015, %	Share of the average annual salary of employees, Bulgaria = 100 %
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Bulgaria	**100.0**	**100.0**	**100.0**	**64.8**	**-0.59**	**100.0**	**62.9**	**9.1**	**100.0**
Southwestern region	170.1	103.5	133.4	**105.8**	2.22	63.1	-	6.7	124.4
Kyustendil district	54.7	78.1	71.0	40.8	-3.24	0.1	60.2	13.1	71.1
Average unweighted by districts[8]	**72.6**	**92.8**	**81.4**	**-**	**- 2.6**	**-**	**60.0**	**11.5**	**81.4**

Source: NSI and own calculation.

The unfavourable development determines also the low level of GDP per capita, ranks the Kyustendil district on 20th position among the 28 districts in the country (column 1, Table 1). Labour productivity in the Kyustendil District (column 3) is also lower than the average unweighted for the country.

Among the observed indicators in Table I-2 clear interdependencies can be identified. Economic indicators GDP per capita, productivity and foreign direct investment (FDI) are closely related – the correlation coefficient between GDP per capita and labour productivity is 0.85[9], between GDP per capita and FDI is 0.93 and between productivity and FDI is 0.69, (Totev, 2014).

Expectedly, the demographic indicators are interrelated with economic indicators. The population density is most closely related to the economic indicators of the observed demographic indicators. The correlation coefficient between GDP per capita and population density is 0.92. Population density is also closely related to labour productivity, a positive correlation coefficient of 0.65. Since FDI is mainly directed to highly urbanized regions, there is a logical close relationship between population density and FDI.

The stability and sustainability of the firms in the conditions of market competition is also of particular importance for the development of the economy in the Kjustendil district. Comparatively large enterprises, with over 250 people employed, are relatively few, and

[8] The comparison of the indicators for Kyustendil district with the average unweighted for the 28 districts is more appropriate in some cases, because the weighted average is strongly influenced by the data for metropolitan city Sofia – see column 1, total average for Bulgaria 100, average unweighted 72.6.

[9] Linear correlation coefficients calculated on the basis of the information on observed indicators for the 28th districts in Bulgaria.

they are concentrated in the municipalities of Kyustendil, Dupnitsa and Bobov Dol. The structure of the companies according to the number of employees shows a trend of increase of the firms with up to 9 employees for Kyustendil district – a trend which is characteristic for the country as a whole (Table 2).

Table 2

Share of firms according to the employed persons in Bulgaria and Kjustendil and Blagoevgrad districts, %

Region	Number of employees	2005	2010	2015
Bulgaria	Up to 9 employed	89.2	91.9	92.4
	from 10 to 49 employed	8.7	6.6	6.2
	from 50 to 249 employed	1.8	1.3	1.2
	More than 250 employed	0.3	0.2	0.2
	Total	100.0	100.0	100.0
Kyustendil	Up to 9 employed	91.2	92.8	93.5
	from 10 to 49 employed	6.7	5.7	5.2
	from 50 to 249 employed	1.8	1.3	1.1
	More than 250 employed	0.3	0.2	0.2
	Total	100.0	100.0	100.0
Blagoevgrad	Up to 9 employed	88.9	92.1	93.3
	from 10 to 49 employed	8.5	6.4	5.6
	from 50 to 249 employed	2.4	1.4	1.0
	More than 250 employed	0.2	0.1	0.1
	Total	100.0	100.0	100.0

Source: NSI, Infostat

The data in Table 2 shows that the majority of these companies fall in the category of micro companies with the inherent characteristics – limited opportunities for innovation and use of European development programs, as well as other specific features.

The educational level of the population of Kyustendil is lower than the average (the percentage of population with higher education in Bulgaria in 2015 is 27,5%), but for a region that is peripheral and in the absence of a Higher education institution (University), the percentage of 23.7% of the population with higher education in 2015 can be considered as relatively high.[10]

The R&D expenditures for Kyustendil district are very low, at the rate of 0.1% of all the country's expenditures. For example, the ones in Blagoevgrad district are about 4-5 times higher. Similar are data for the employed people in R&D activity (Table 3).

[10] NSI, Infostat.

Table 3
Research and Development activities and access to Internet for Bulgaria and Kyustendil and Blagoevgrad districts*

Indicators	Regions	Measures	2010	2011	2012	2013	2014	2015
R&D Expenditures	Bulgaria	1000 BGN	421612	429566	496176	521682	664829	850457
	Kyustendil		1063	..	..	..	712	..
	Blagoevgrad		..	4339	..	3045	3421	4079
Persons employed with R&D	Bulgaria	Number	20823	20810	21677	22307	25484	29591
	Kyustendil		132	..	..	..	110	132
	Blagoevgrad		..	639		628	587	613
Share of household with access to Internet	Bulgaria	%	33.1	45.0	50.9	53.7	56.7	59.1
	Kyustendil		21.4	35.2	31.7	52.4	45.8	50.3
	Blagoevgrad		24.3	42.3	54.9	60.5	61.9	63.3
Share of persons using Internet on a regular basis (in age 16 -74)	Bulgaria	%	41.6	46.4	50.3	51.2	53.7	54.6
	Kyustendil		30.9	32.7	32.2	48.6	40.0	46.5
	Blagoevgrad		34.1	38.8	48.0	51.1	54.3	55.6

* ".." - Confidential information
Source: NSI, Infostat

By indexes access to the internet and a share of internet users aged 16-74, Kyustendil district lags behind both the average levels for the country and Blagoevgrad district, which indicators are slightly higher than these average levels.

Northeast Region of Macedonia

In 2007, under the imperative to harmonize its laws with the EU, Macedonia adopted the Nomenclature of Territorial Units for Statistics (NUTS 3 level) and created eight statistical regions: Vardar, East, South-West, South-East, Pelagonija, Polog, North-East and Skopje.

The total area of the Northeast Planning Region is 2,310 km^2, i.e. 9.3% of the total territory of the Republic of Macedonia. This planning region consists of 6 municipalities (Kumanovo, Lipkovo, Staro Nagorichane, Kratovo, Kriva Palanka and Rankovce) with 176,018 inhabitants (8.5% from total population in Macedonia).[11]

According to the level of development, the Northeast planning region is the economically least developed planning region in the Republic of Macedonia. Its share in the Gross Domestic Product (GDP) of the Republic of Macedonia (table 4) is at a modest level of 5.0% (for 2014), which is much less than the share (9.3%) of the region in the total territory and the total population of the country (8.5%).

[11] Data from 30.06.2014 (Regions of the Republic of Macedonia, 2017, State Statistical office, Republic of Macedonia).

Table 4

Gross Domestic Product

	2009	2010	2011	2012	2013	2014	2015	2016
Republic of Macedonia								
Gross Domestic Product (in million MKD)	410.734	434.112	459.789	466.703	499.559	527.631	558.240	607.452
Northeast region								
Gross Domestic Product (in million MKD)	18.299	19.021	25.288	25.891	26.613	26.181	N/A	N/A
Participation	4.5%	4.4%	5.5%	5.5%	5.3%	5.0%	N/A	N/A

Source: Data obtained by Makstat (http://www.stat.gov.mk/) and World Bank Country profile for 2016.

Measured per inhabitant (Table 5), the Northeast planning region in 2015 had a gross domestic product of 164,161 Macedonian denars (MKD).

The acceleration of the economic activity in the region and the gradual escape from the crisis since the end of last decade affects to increase the GDP per person from 4.5% in 2009 to 5.5% in 2012. However, the share again decreased and reduced to 5,0% in 2014 (Table 4). This means that the Northeast planning region developed relatively faster than some other regions.

Table 5

GDP per inhabitant

GDP per inhabitant (MKD)	2009	2010	2011	2012	2013	2014	2015	2016
Republic of Macedonia	200.293	211.246	223.357	222.519	241.827	255.206	269.514	287.760
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	N/A
Northeast region	104.775	108.664	145.554	147 095	151.328	148.745	164.161	N/A
	52 %	51 %	65 %	66 %	63 %	58 %	61%	N/A

Source: http://www.stat.gov.mk/KlucniIndikatori_en.aspx, http://www.worldbank.org/en/country/macedonia/overview#2

The Northeast planning region in 2016 had 4,095 active business entities and compared to 2010, the number of active entities decreased by 6.86%, while the decreased number of active entities in the Republic of Macedonia was 5.27% (Table 6).

According to the size of the business entities (the number of employees – for 2016), most of the active business entities in the region (90.55%) are micro enterprises (<10 employees) with small accumulation force and established with the purpose of economic existence of the founders and employees, and not for more serious business purposes, especially not in the area of asking of greater innovativeness. In the Northeast region are located 87 medium enterprises and only 4 big (+250 employees) business entities (Table 7).

Table 6

Active business entities

Active business entities	2010	2011	2012	2013	2014	2015	2016
Republic of Macedonia	75.497	73.118	74.424	71.290	70.659	70.139	71.519
Per 1.000 inhabitants	36,70	35,50	36,09	34,51	34,15	33,86	34,49
Northeast region	4.397	4.279	4.283	4.303	4.159	4.139	4.095
Per 1.000 inhabitants	25,10	24,41	24,40	24,47	23,63	23,49	23,24

Source: MAKSTAT (2017).

Table 7

Structure of the business entities (by number of employees)

Region	Northeast region			Macedonia		
Size / Year	2014	2015	2016	2014	2015	2016
0	102	299	315	3972	7329	8057
1-9	3651	3451	3393	60215	56261	56725
10-19	170	170	170	3092	3032	3111
20-49	146	125	126	1869	1947	2030
50-249	83	87	87	1305	1339	1363
>250	7	7	4	206	231	233
Total	**4159**	**4139**	**4095**	**70659**	**70139**	**71519**

Source: MAKSTAT (www.stat.gov.mk).

The most valuable sectors in the economic activities are the industry (food, chemical and metal, tobacco and cigarettes) and construction. The Northeast Region had the lowest share of 2.1% in total gross fixed capital formation in 2014 (Table 8).

Table 8

Gross fixed capital formation

Investments in fixed capital (in million MKD denars)	2010	2011	2012	2013	2014
Republic of Macedonia	82,968	94,698	109,071	119,003	123,549
Northeast region	2,150	1,145	2,645	2,482	2,543
Participation	2.6 %	1.2 %	2.4 %	2.1%	2.1 %

Source: MAKSTAT (www.stat.gov.mk).

The employment and unemployment rates of the population at the regional level show fluctuations (differences) in relation to the total rates at the country level. The rate of active population for the region has slowly increased in the last three years, and also the employment has increased and unemployment has declined. However, comparing with the national average, these indicators, in total, are insufficient to assess that the situation on the labour market in the Northeast planning region will be positive.

Table 9

Labour force market

	Macedonia			Northeast Region		
	2014	2015	2016	2014	2015	2016
Working population	1.673.494	1.676.659	1.678.890	140.454	141.719	142.121
Active rate	57.3	57.0	56.5	54.2	54.0	55.4
Employment rate	41.2	42.1	43.1	30.3	30.6	32.0
Unemployment rate	28.0	26.1	23.7	44.0	43.2	42.2

Source: MAKSTAT (www.stat.gov.mk).

Unfortunately, the lowest employment rate in 2016 was again observed in the Northeast Region and the highest unemployment rate was registered in the same region (Table 9).

2. Results from the survey of the innovation activity of the business sectors in the two Border Regions

This part of the paper concerns innovations and it is mainly based on the analysis of the results obtained from the survey conducted in June and July 2017 in the framework of the Interreg-IPA Project № CB006.1.31.158 ″Bulgarian-Macedonian Cross Border Cooperation for Capacity building for Competitiveness and Innovation″. The survey which was based on the methodology of the ″European Community Innovation Survey″ (CIS), includes 150 firms from Kyustendil District in Bulgaria and 150 from Northeast Region in Macedonia that were interviewed using a stratified sample. The survey refers to the period 2012-2016.

In the beginning of the survey, it has been explained to the interviewee what an innovation is considered to be, its characteristics and types. Also, a special type of innovation, renewable energy sources (RES), was investigated.

The sample in the case of the Kyustendil District includes: 66% microenterprises, small – 31%, medium-sized – 2%, and large – 1%. Representatives of services sector are 33% of companies, manufacturing – 33%, trade – 27% and other sectors – 7%.

The sample in the Northeast Region includes: 87 micro enterprises (up to 9 employees), 48 small (10-49 employees), 14 medium-sized (50-250 employees), and one large (> 250 employees). Representatives of services sector are 60 of companies, 44 in manufacturing, 45 in trade and one in other sectors.

The interviewees in the both regions are mainly owners and managing directors of the companies, i.e. people who participate in taking decisions and represent different economic sectors. Selected results from the survey are presented below.

In both countries according to the survey a significant number of firms have been engaged in any activities related to introduction or initiation of innovative activities – in Macedonia about 40% and in Bulgaria more than half of firms. In Macedonia most often activities related to introduction or initiation of innovation activities are: trainings for innovative

activities and acquisition of machinery, equipment, software & buildings. In Bulgaria these activities are: employment of new staff and acquisition of machinery, equipment, software & buildings (Table 10).

Table 10

During the last five years (2012-2016) have your enterprise engaged in any activities related to introduction or initiation of innovative activities

Type	% of all cases	
	Bulgaria	Macedonia
In-house R&D	4.0	0.0
External R&D	2.7	0.0
Acquisition of machinery, equipment, software & buildings	17.3	24.7
Acquisition of existing knowledge from other enterprises or organizations	0.7	2.0
Training for innovative activities	11.3	26.0
Introduction of a new or significantly improved product (good, service)	06.7	19.3
Change in the organization	16.7	8.7
Employment of new staff	20.0	2.0
Market introduction of innovation	3.3	4.0

Only few companies in the Bulgarian survey have been engaged in in-house or external R&D activities, and none in the Macedonian survey. Also, only 3% of enterprises in Bulgaria have introduced renewable energy sources (RES) and no one in Macedonia. The innovations are most often new for the company or new to the local market.

Most of the respondents with innovations in Bulgaria and only 12.7% in Macedonia have made some kind of legal protection of their innovations. The most common form of protection in both countries is “trademark”.

Concerning kinds of innovation (Table 11), about 41% of interviewees in Bulgaria have introduced innovations in some sphere during the last five years; most often this is an organizational innovation. In Macedonia 39.3% of interviewed companies have introduced innovations in some sphere during the last five years, where the most frequent types of innovations were – service and process innovation.

Table 11

During the last five years have your enterprise introduced any kind of innovation in the following fields /aspects?

Sphere of innovation	% of all cases	
	Bulgaria	Macedonia
Goods innovations	5.3	16
Service innovations	8.7	23
Process innovation	8.0	22
Organisational innovation	17.3	17
Market innovation	1.3	7

In Macedonia 48% of respondents are currently developing some innovations, less enterprises in Bulgaria (33% of responses) have answered that currently they have some innovations in the process of development. Again, the most common in Bulgaria are the organizational innovations and in Macedonia marketing innovations.

Innovation activities are more typical for bigger enterprises in the survey. Answers of medium-sized and large firms show that they have pointed out all kinds of innovations and innovations in all spheres, which they have introduced during the last five years. Innovations in micro enterprises are limited to acquisition of machinery, equipment, software & buildings; change in organization and employment of new staff, as well as organizational innovations and service innovations.

Concerning the effect of innovations according to respondents, innovations most often have had slightly positive influences on the enterprises and these are related usually to increased turnover, profits and market share. In Macedonia innovations have greater positive influence according to responders (Table 12).

Table 12

Direct influence of innovations on respondents' business

1 – it might have some negative influence; 2 – not at all; 3 – it might had some positive influence; 4 – it had slight positive influence; 5 – it had moderate influence; 6 – it had great influence

Type of influence	Weight average rang	
	Macedonia	Bulgaria
Increase turnover	5.4	4.1
Increase profit on enterprise level	5.3	4.0
Increase profit margins	5.1	3.9
Increase market share	5.2	3.9
Decrease costs	4.7	2.7

It is interesting to note that in both countries most of the respondents with innovations have financed the development of their innovations though own financing (Table 13). It is the case for 86% of the micro firms, 60% of small ones and 40% of large ones in Bulgaria and for 39.1% of the micro firms, 54.2% of small ones and 100% of the medium-sized firms in Macedonia. The opposite is the situation with EU funds – in Bulgaria only 2 and 3% of micro and small firms have used such funds to finance their innovations, in contrast to large firms – 40% of these respondents have EU financing. In Macedonia none of the respondents have received such financing. These differences are understandable for various reasons it is more difficulty for micro and small firms in Bulgaria to benefit from the EU funding and such funds are not available for Macedonia.

The sources of financing are an important topic and a special survey should be dedicated to the issue to study it in more detail.

It is important to be noted that in both countries the majority of enterprises with innovations that participated in the survey (90.2% of all Bulgarian respondents and 95.3% of Macedonian ones) have not received any support from public sources during the last five years for their innovation activities (Table 14). There are six cases of EU grants and single

cases of other types of support. This fact raises serious questions about the role public sources should play.

Table 13

Financing the development of innovations (in %) for Bulgaria

Tipe of financing	Type of enterprise by number of employees, %					
	Bulgaria			Macedonia		
	Micro	Small	Large	Micro	Small	Medium
Own financing	86	60	40	39.1	54.2	100.0
lown from a bank	12	31	20	1.1	8.3	21.4
Private investors / private investment fund	0	3	0	0.0	0.0	0.0
Public financing - from national funding (Excluding EU funds)	0	3	0	0.0	0.0	7.1
From EU fuded funds	2	3	40	0.0	0.0	0.0

Table 14

Public support for innovation activities received by enterprises during the last five years in Bulgaria

Support	Percent of cases*	
	Bulgaria	Macedonia
Tax credits or deductions	1.6	0.0
Subsidized loans	0.0	1.3
Loan guarantees	0.0	0.0
Direct grants (EU funding)	9.8	0.7
Involvement of educational events – workshops, conferences	1.6	2.0
Providing training on innovation	1.6	1.3
No, we haven`t received any support	90.2	95.3

* Multiple answers.

It is also interesting to note that most of the companies have not prepared a project for EU programmes in the field of the innovations, environment, RES or are not interested at all in such projects (Table 15). There are single cases of approved projects for energy efficiency and RES, and no projects for innovations among the interviewees in Bulgaria. In the case of Macedonia there are not approved projects for energy efficiency and RES, neither approved projects for innovations among the interviewees.

The interviewees with innovations have been asked to make a self-evaluation of the innovativeness of their enterprises (Table 16). Most of them, in the case of Bulgaria, consider themselves to be modest innovators and firms that introduce changes only to follow market minimum requirements. This result is in conformity with the general assessment of the innovativeness of the country. According to the European Innovation Scoreboard 2017 Bulgaria is a Modest Innovator as well as Macedonia. Over time, performance has not changed relative to that of the EU in 2010[12]. In the case of Macedonia 15,3% of the innovators consider themselves to be modest innovators and 32,2% of the

[12] https://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_en

companies consider themselves to be innovators, but innovation activities are not their primary focus.

Table 15

Do you have any EU funded projects in the field of innovations, environment, RES or not interested at all in such projects (percent of respondents with innovations)

	Bulgaria	Macedonia
Yes, we have approved project	8.2	0.0
No, we applied but were not approved	6.6	6.7
We have submitted project(s), but still waiting for results	1.6	0.7
We haven`t prepared a project yet	72.1	40.7
We are not interested in such projects	11.5	52.0

Table 16

How would you evaluate the innovativeness of your company? (%)

Degree of innovativeness	Bulgaria	Macedonia
1 Our company is not innovative	8.3	0.0
2 Our company introduces changes only to follow market minimum	38.3	13.6
3 Our company is modest innovator (follow innovative companies)	41.7	15.3
4 Our company is moderate innovator	8.3	28.8
5 Our company is innovative but this is not our primary focus	1.7	32.2
6 Our company is very innovative	1.7	10.2
Total	100.0	100.0

Enterprises participating in the survey have been asked about their intentions and interest to develop innovations at the company in the future (Table 17). The majority of respondents in both countries are either looking for opportunities, or expressing interest to know more about the issue.

Table 17

Are you considering developing any innovation activities at your company in the next three years? (percent of cases)

	Bulgaria	Macedonia
1 Yes, we have some concrete idea /innovation in mind	8.7	26.0
2 Yes, we are looking around for opportunities, though not thought not having anything particular in mind	24.0	24.7
3 Not yet, but would be interested to know more about that	34.0	44.7
4 We do not intend and not interested in applying innovation	16.0	3.3
5 Not relevant to us/I think that our business is not suitable for implementing innovations	17.3	2.0
Total	100.0	100.0

Some of the firms have specific intentions in the field of energy and RES (Table 18). Most of the interviewees in Bulgaria (77.3%) are interested in applying measures for improving energy efficiency. Also a significant share of respondents has pointed out "solar collector and heater" (25.8%) and "eco transportation vehicles" (9.1%). In Macedonia most of the respondents are interested in energy efficiency measures (58.7%), photovoltaic panels (28.7%), solar collector and heater (18.7%) and eco transportation vehicles (15.3%).

Table 18

Intentions of the company in the next 5 years to invest in some RES equipment or in improving energy efficiency (percent of cases)

	Bulgaria	Macedonia
Measures for improving energy efficiency	77.3	58.7
Solar collector and heater	25.8	18.7
Eco transportation vehicles	9.1	15.3
Heating system on biogas	3.0	5.3
Photovoltaic panels	1.5	28.7
Water power station	1.5	0.0
Geothermal heating system	1.5	4.0
Other	1.5	0.0

** Multiple response question*

On the national level, in the business sector in Macedonia, in the period 2012-2014, 36% of the enterprises reported some form of innovation activity.[13] Hence, the indicator for R&D Intensity (participating in research and development of the GDP) relating to Macedonia is 0.22% (Erawatch, 2013), and the participation of the business sector in investment for research and development turns out to be in the range of 18 to 20%. According to the data in business sector in Bulgaria, in the period 2012-2014, 26.1% of the enterprises have introduce product, process, marketing or organizational innovation.[14] The indicator for R&D Intensity (participating in research and development of the GDP) in Bulgaria is 0.57%, and the participation of the business sector in investment for research and development turns is somewhere around 50% (European Union, 2013).

[13] As a data source for all presented data on innovation for Macedonia is State Statistical Office of Republic of Macedonia and EUROSTAT.
http://www.stat.gov.mk/pdf/2016/2.1.16.20.pdf
http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database

[14] As a data source for all presented data on innovation for Bulgaria is National Statistical Institute of Republic of Bulgaria and EUROSTAT
http://www.nsi.bg/sites/default/files/files/pressreleases/NIRD_Innovation2014_en_R518IJ7.pdf
http://ec.europa.eu/eurostat/web/science-technology-innovation/data/database

3. Main findings and conclusions

The conducted analyses shows that Kyustendil Region according the key economic indicators as GDP growth (in current prices), GDP per capita, labour productivity, foreign direct investments etc. is one of the least developed regions in the Republic of Bulgaria. Even worst is the situation with Northeast Region which according to the level of development (GDP per inhabitant, active business entities per 1.000 inhabitants, participation in gross fixed capital formation, employment rate etc.), is the economically least developed planning region in the Republic of Macedonia.

According to the survey, companies in Bulgaria and Macedonia can be regarded as modest innovators. Although over half of the respondents from Macedonia and more than half of the respondents from Bulgaria state that they have carried out some innovation-related activities over the past 5 years these are limited types of innovation, mostly related to change in the organization and acquisition of machinery, equipment, software & buildings. There are few cases of product and process innovation, as well as R&D in the enterprise or use of external R&D in the case of Bulgaria. Also, few enterprises in Bulgaria have introduced renewable energy sources or have made improvements in the energy efficiency of businesses (Mochurova, Kotseva-Tikova, 2018). In the case of Macedonia none of the enterprises in the analyzed period has been engaged in in-house or external R&D activities neither in introduction of RES.

Most of the respondents in Bulgaria and only 12.7% in Macedonia have taken legal action to protect their innovation and the most common form of protection of innovations in both countries is "trademark". The domination of trademarks can largely indicate the limited capacities of enterprises from the two cross border regions for introducing of technological innovations.

The innovations had only a slight positive effect on the activity of the surveyed companies in Bulgaria and a greater positive effect in Macedonia. A large part of the enterprises in both countries have financed innovations with their own funds and did not receive support from public sources.

Respondents also consider institutions to be relatively passive – municipalities, as well as professional and industry associations, education, research and consultant organizations. Institutions should be more active and beyond the formal implementation of their legal obligations to take concrete initiatives to strengthen their role in innovations and cross border cooperation. The recommendation can also refer to similar organizations in Macedonia.

Lack of information, lack of competence in the institutions, including municipalities, lack of specialists in these institutions, are highlighted as obstacles to European funding projects in the both countries.

Companies are interested in exploring the opportunities for innovation in the future. Although relatively a small share of respondents have a specific idea at the moment, the respondents have a positive attitude and desire to seek information and cooperation, which is a prerequisite for developing innovation and competitiveness in the cross-border area.

Much of them are interested in implementing energy efficiency measures, photovoltaic panels and solar heat collectors. In Macedonia many respondents are interested in passive houses.

Analyzed data on national level in the field of innovations for the period 2012-2014 shows higher innovativeness of the Macedonian business sector (36%) compared with the Bulgarian business sector (26.1%), in the same period. From the other side the indicator for R&D Intensity for the Republic of Macedonia is over 0.22% and the participation of the business sector in investment for research and development is over 20%. This situation in the Republic of Bulgaria with indicator for R&D Intensity of 0.57% and the participation of the business sector in investment for research and development with around 50% seems significantly better.

In the analyzed period (2012-2014), in the case of Macedonia (on national level), almost 20% of the innovators have introduced technological innovation, almost one quarter, 24.8%, of innovators have introduced non-technological innovation and over 56% of the innovative enterprises have introduced both technological and non-technological innovation. Considering the four types of innovations, the enterprises mostly introduce process innovations, 22.8%, and marketing innovations, 22.3%. From the other side, Bulgaria is the country where, in the analyzed period 2012-2014 (on national level), enterprises are introducing more technological innovations than non-technological innovations. Almost 38% of the innovative enterprises introduce innovation on product or process only. As regard to the non-technological innovations, only marketing or organizational innovations introduce 34.6% of the innovative enterprises in Bulgaria. And at the same time both types of innovations, technological and non-technological are introduced by 27.7% of the innovative enterprises. Considering the four types of innovations, marketing innovations prevail in business sector in Bulgaria, where 11.7% from the total enterprises have introduced marketing innovation (Antovska and Drangovska, 2017).

It should be concluded that the innovation capacity of the country is important, but… ″a major importance belongs to the ability to introduce relevant changes, and to implement the international practices and technologies at enterprise level″ (Petreski and Lazarov, 2015, p. 61).

4. Recommendations

4.1. Recommendations for the development of the Bulgarian Competitiveness and Innovation Ecosystem

Recommendations to national and local authorities:

- As a priority, the authorities from the border regions should support the establishment of working CBC centres in the regions;
- Cooperate at the level of staff education;
- Help transfer of experience and know-how;

- Financial and technical assistance to firms; including assistance for partnership projects between enterprises and research organisations on interdisciplinary issues that could foster innovativeness
- Increase financial assistance to cross border networks – telecommunications, infrastructures;
- Promote and stimulate resource efficiency, energy efficiency measure, decentralised renewable energy sources;

Recommendations to business organizations and other stakeholders:

- Foster innovativeness by conducting trainings on topics like: Innovation management or product development, Generating innovative ideas, Process development and optimization, Export promotion support
- Initiate contacts and cooperation with universities, science and research organisations and facilitate the development of applied interdisciplinary projects.

4.2. Recommendations for the development of the Macedonian Competitiveness and Innovation Ecosystem

Important recommendations for the Central government

- Public assistance in the field of R&D is important because it directly contributes to strengthening the research capacity of the domestic scientific institutions, to encouraging and facilitating their cooperation with the business sector and to intensifying their international cooperation. It should be ensured that within the central budgets, the expenditures on R&D will be treated as non-discretionary expenditures (like for example, liabilities for servicing the public debt of countries).
- Strengthening of the competitive pressure in the economy through continued improving of the investment climate in the country – building infrastructure, easier access of firms to business premises, prevention of monopolistic behavior and misuse of the monopolistic positions of individual firms, transparency and fairness in the field of public procurements, eliminating the corruption, abandoning the practice of involving politics in business, etc.
- The strategies for improving the innovation of the enterprise sector pay particular attention to the need to raise entrepreneurs' awareness of the importance of innovation for business performance (OECD, 2011). It is therefore necessary to raise the understanding and awareness of the business-sector for the benefits from the innovation activity – the organization of seminars, round tables, conferences, media campaigns etc., with debates on the benefits from the innovation activity of businesses, which is a measure that can give significant results in this aspect.

- Very important measure for raising the innovation of enterprises is the encouragement of their cooperation with well-known foreign companies that have invested in Macedonia (with foreign direct investors), through the development of the subcontracting, i.e. by enabling our businesses to produce various inputs (spare parts, semi-products, etc.) for the needs of foreign investors. This would enable the inclusion of Macedonian enterprises to the global value chain.
- Increasing the capacity of the country (i.e. of the entrepreneurs and employees in companies, as well as of the administration in the local self-government units) for using the assets of the European pre-accession funds.

Important recommendations for the local self-government units

We think that several suggestions for the local self-government units are especially relevant:

(1) In our opinion, only young, ambitious, highly educated workers (economists, lawyers, engineers, technologists etc.), with necessary knowledge in the area of entrepreneurship and innovations, and with motivation to work and learn, can induce the entrepreneurial process on local and regional level. Sometimes it is sufficient to employ a small number of young and capable people in the most important departments, with competences in the field of support to the development of businesses and entrepreneurship, in order to "shake" and "wake" the departments and the people, and to create a network of supporters in the municipality, region and wider. Their tasks would be:

- Creation of solid and rich statistical registry of the number of active SMEs in the municipality and region, especially of innovative firms and of firms with high growth potential, preparation of development programs and proposal of measures for entrepreneurial process support;
- Preparation of projects for infrastructure undertakings which would have a strong impact on improvement of the business climate and looking for financial resources for their realization;
- Creation and support of initiatives for the development of qualitative entrepreneurial processes: establishment of business-incubators, accelerators and clusters, local economic development offices, and regional centers for SME and entrepreneurship support etc., in cooperation with local businesses, educational institutions, regional entities of the economic chambers etc.
- Introduction of educational programs for existing and future entrepreneurs in cooperation with the higher education institutions and other scientific institutions from the region and beyond.
- Recording good entrepreneurial ideas and encouraging and supporting their creators;
- Development of programs which would facilitate subcontracting of local firms with large enterprises, especially with larger foreign investors. This includes a good

identification of the existing and future local firms, their production program and production possibilities, organization of trainings for the employees in those firms, of course, in cooperation with the large companies, etc.

We would like to emphasize here that the costs for wages for new employments can be returned in the medium run, and the long run effects can be significant. Moreover, it should always be kept in mind that the development of entrepreneurship does not have to be based only on full-time jobs. In the entrepreneurial process, many people can be engaged in project assignments, in consulting assignments etc.

Important recommendations for the business sector

- One of the most important barriers for introduction of innovations in Macedonian business entities is the access to funding for their development. In Macedonia from the one side there is a necessity for developing a venture capital market (formal and informal). From the other site, in order to insure bigger use of classic bank loans firms must make an additional effort to raise the quality of business planning. They need to be trained in developing investment programs, based on innovative and profitable business idea.

There are two key institutions in the Republic of Macedonia that provide financial support for innovative SMEs and export-oriented companies: Macedonian Bank for Development Support (MBDS) and Fund for Innovations and Technological Development (FITD).

In our opinion, MBDS as a state-owned bank that provides loans to businesses with subsidized interest rates, which are approved through commercial banks under strict banking criteria, should be capitalized. Also, it is necessary the utilization of the opportunities offered by the FITD to be increased.

- The training of companies for participation in qualitative entrepreneurial processes and for raising their innovation can be significantly facilitated by their participation in the realization of the European projects. These projects enable the companies to have training and education of the employees, learning from the best practices of the successful companies, assistance in improving the business planning, assistance in setting up and implementing programs for innovating their products and services, etc. Therefore, the responsibility of the central government and of the local governments is to improve the system of information about the opportunities offered by the European funds and to animate the companies in the realization of these projects.

Specific measures for development of joint cross border Competitiveness and innovation Ecosystem

1. Forming a two-sided expert group (economic council), which will prepare a presentation of the region as a whole which can be offered to potential investors. The presentation should include an introduction of: the resources of the region, the

advantages, special features of the economic legislation of the countries, the requirements and preconditions for doing business, tourism opportunities, etc.

2. The same or different two-sided group can be created to work on a permanent basis, elaborating joint projects and looking for funding.
3. **Establishing permanent contacts and cooperation between business-incubators, regional business-councils.**
4. **Creating a centre for support of SMEs and joint SMEs.**
5. Establishing a regional Information Pool and business and information centres.
6. Re-starting active cooperation between the universities, as well as BAS, in the field of education, scientific-research work and other fields of common interest, (some agreements on cooperation were signed between the universities but in practice there is no real activity).
7. Creation of a web-site of the region presenting the opportunities for investments, containing a catalogue of firms that are looking for partnerships; containing also information about the trade and investment conditions in the region – description of legislations, custom/tariff information, Free Trade Agreements etc.

References

Antovska, M., Drangovska, T. (2017). Comparative analysis of innovativeness of the business sector in the Republic of Macedonia with the selected countries in the region. – CEA Journal of Economics, Vol. 12, No. 1, pp. 39-53.

Dimitrov, M., Totev, S., Mochurova, M., Fiti, T., Polenakovich, R., Antovska-Mitev, M. (2017). Competitiveness and Innovation at Local and Regional Level – The Case of Northeast Planning Region in the Republic of Macedonia and Kyustendil District in the Republic of Bulgaria. MASA and BAS, 106 p.

European Commission. (2017a). European Innovation Scoreboard 2017. EC, Brussels.

European Union. (2013). Research and Innovation Performance in EU Member States and Associated countries. Brussels.

Fiti, T., Hadzi Vasileva-Markovska, V., Bateman, M. (2007). Entrepreneurship, Faculty of Economics – Skopje (in Macedonian).

Fiti, T., Filipovski, V., Tashevska, B., Antovska, M. (2017). Innovations entrepreneurship in the Macedonian business sector. – World Review of Entrepreneurship, Management and Sustainable Development, Vol. 13, N 2/3, pp. 194-210.

MAKSTAT. Databases of the State Statistical office, Republic of Macedonia, http://www.stat.gov.mk/.

MAKSTAT. (2017), Regions of the Republic of Macedonia, 2013, 2014, 2015, 2016, 2017, State Statistical office, Republic of Macedonia.

Mochurova, M. (2018). Summary Evaluation of the Green Economy in Bulgaria. – In: Transbnational transfer of administrative models and instruments: possibilities, contraints and risks, International Conference Proceedings, Sofia University, p. 437-452.

Mochurova, M., Kotseva-Tikova, M. (2018). Development of renewable energy sources in Kyustendil District. – In: Challenges to agri business and rural regions, Conference proceedings, p. 288-294, ISBN:: 978-619-232-093-5 (in Bulgarian).

Mochurova, M., Kotseva-Tikova, M., Bransova, P. (2018). Green economy – concepts and evaluation for Bulgaria. Fast Pront Books, 62 p., ISBN 978-619-7312-79-9 (in Bulgarian).

National Statistical Institute. Regional Statistics, Bulgaria, http://www.nsi.bg/en/content/11262/regional-statistics.

National Statistical Institute. (2018). Electronic edition of the publication "Regions, Districts and Municipalities in the Republic of Bulgaria 2016" http://www.nsi.bg/sites/default/files/files/publications/ROO_2016.zip.

OECD. (2011). The Former Yugoslav Republic of Macedonia: Review of the National Innovation System. OECD Development Center, Paris.

Petreski, G., Lazarov, D. (2015). The Innovation capacity and Economic growth: Empirical estimation. – In: Economic recovery in the post-crisis period, Proceedings from International Conference. Faculty of Economics-Skopje, Skopje.

State Statistical office of the Republic of Macedonia. (2017). Regions of the Republic of Macedonia, Skopje.

OECD. (2008). Public-Private Partnerships. Paris: OECD.

Polenakovik, R., Sutevski, D., Gecevska, V., Jovanovski, B. (2014). Report prepared for the World Bank regional office in Skopje – Selection of Macedonian best practices companies in the area of competitiveness, export orientation, job creation and innovativeness – Lessons learned, World Bank internal report, July 2014, Skopje.

Totev, S. (2014). Regional convergence and economic growth. Part of the annual report "Economic development and economic policy of Bulgaria: assessment and expectations – Special focus: inequality and poverty – dynamics and policy for reduction, Economic Research Institute, GorexPress Sofia, 2014, pp. 113-127.

Totev, S., Boyadjieva, M. (2003). Potential for cross-border economic development in the Nis-Skopje-Sofia Triangle. East-West Institute (EWI), Prague, pp. 1-65.