

INNOVATION, DIGITALIZATION AND INTEGRATION IN THE BALKAN REGION

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Abstract: *The paper attempts to characterize innovation, digitalisation and integration of enterprises in the Balkan region on the case of a survey of 1941 enterprises from the forestry sector on cross border region between Bulgaria and Macedonia taking place in 2017. The data used meets general requirements of OECD and EUROSTAT OSLO Manual. it draws conclusions about dominated companies' profile by size, by ownership and legal status, by connectivity, and by activity according to NACE Rev.3; about R&D and export intensity of studied enterprises in the cross border region as characteristics of innovation and cooperation potential; about innovation activity and innovation policy of that firm; its digitalization and export intensity level.*

Keywords: *Innovation, Digitalization, Integration, Bulgaria, Balkan Region.*

ITHEA keywords: *J.4 Social and Behavioral Sciences: Economics*

Introduction

The regional integration is a precondition for sustainable development and competing in global economy. Innovation and digitalization characterize potential for such integration. In this respect the paper applies bottom-up approach to analyses of data, resulted from a survey of 1941 enterprises on cross border region between Bulgaria and Macedonia in the frame of the project "Innovative cooperation initiatives in cross border region (ICI)", INTERREG project CB006.1.31.070. As methodology for collecting and interpreting technology innovation data was used a methodology developed in Economic research institute at the BAS, which meets the general requirements of the OECD and EUROSTAT Oslo manual. The paper interpretes the data collected from the point of view of clarifying potential for economic integration on the Balkans. The topics of interest for study are as follow: socio-demographic structure of respondents and company profile, innovation and digitalization level and policy, R&D and export intensity support.

1. Socio-demographic structure of respondents

The socio-demographic structure of respondents from Bulgaria and Macedonia is characterized by their demographic structure and by the position in the enterprise they represent.

1.1. Demographic structure

As could be expected the male dominate among employees in forestry sector, but Macedonian male respondents are prevailing Bulgarian ones. About 35% of the surveyed people were female (Figure 1).

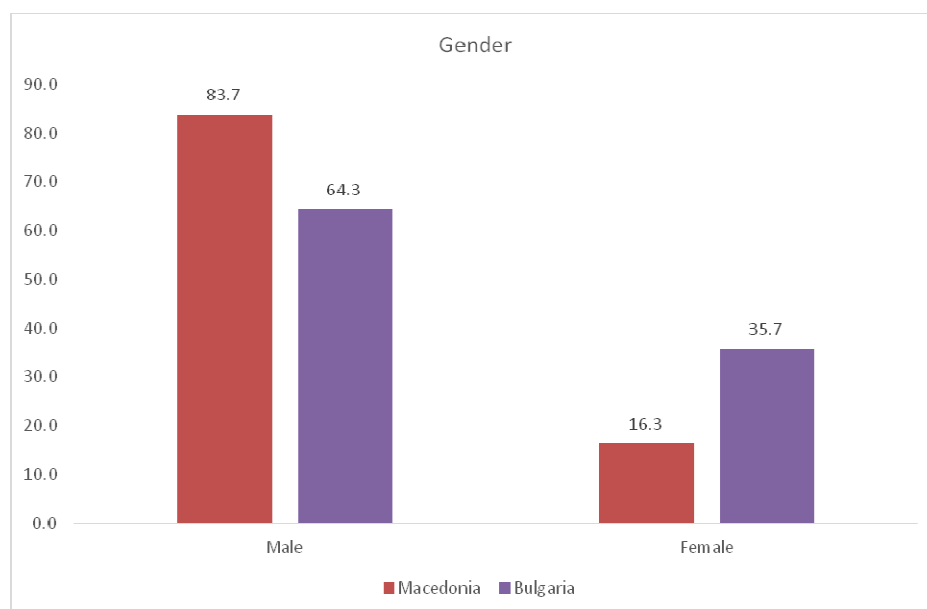


Figure 1

Ageing employees is the second demographic characteristics of respondents in both of the regions, Blagoevgrad and Kyustendil in Bulgaria and Northeastern, Eastern and South-eastern planning regions of Macedonia. In Bulgaria, the largest share – one third of respondents, belongs to the age group of the age 51 and above, while in Macedonia the same share is occupied by the people from the group of 41 and 50 (38,3%).

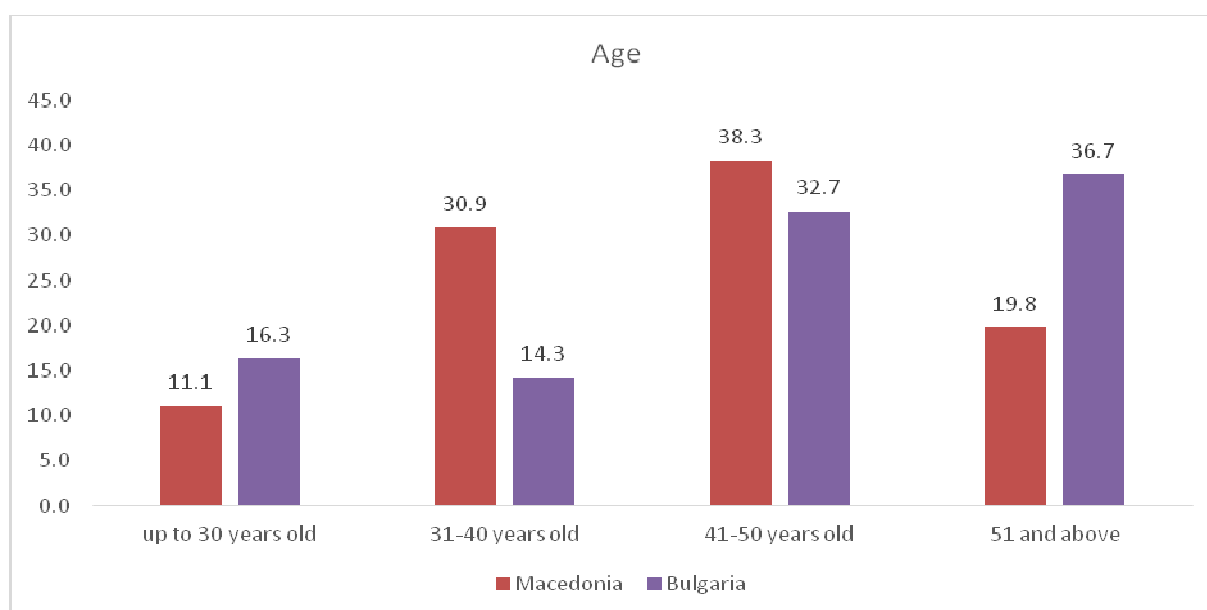


Figure 2

To assume – the age group of 41-years-old or older is occupied by 60% of the respondents in Macedonia and 70% in Bulgaria. (Figure 2).

Educational level of respondents is dominated by people with bachelor or equivalent level diploma, or with short-cycle tertiary education. The representatives from Bulgaria are more often with higher education comparatively to those from Macedonia (Figure 3).

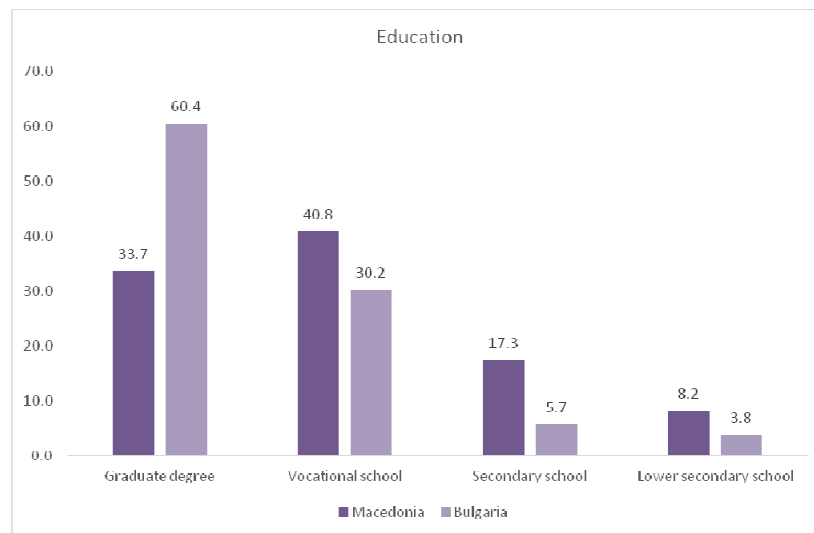


Figure 3

1.2. Position of respondents in the firm represented

The respondents used to be managers of the firms represented are dominating - about 90% in Macedonia and 70% - in Bulgaria. This is a result of a preliminary requirements in the survey to ask predominantly managers, and on the other hand – because of the dominated number of firms were solo liability enterprises. In very few cases the people who answered the questionnaires were applied specialists, administrative staff or skilled workers (Fig.4).

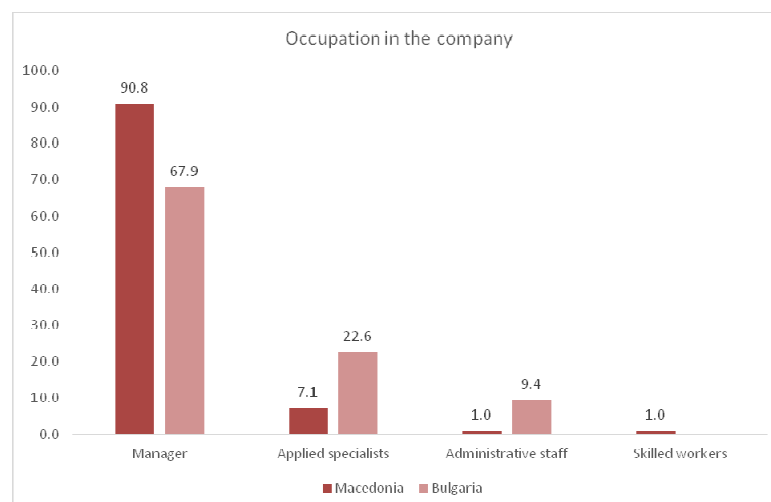


Figure 4

It could be concluded the majority of respondents were managers, male, in the age group above 40 years, with bachelor or short-cycle tertiary education level of education.

2. Companies profile

The companies observed during the survey in Bulgaria were dominated by activities like sawmilling and planing of wood and plating of wood and manufacture of other furniture, while in Macedonia – logging and support services to forestry (Figure 5).

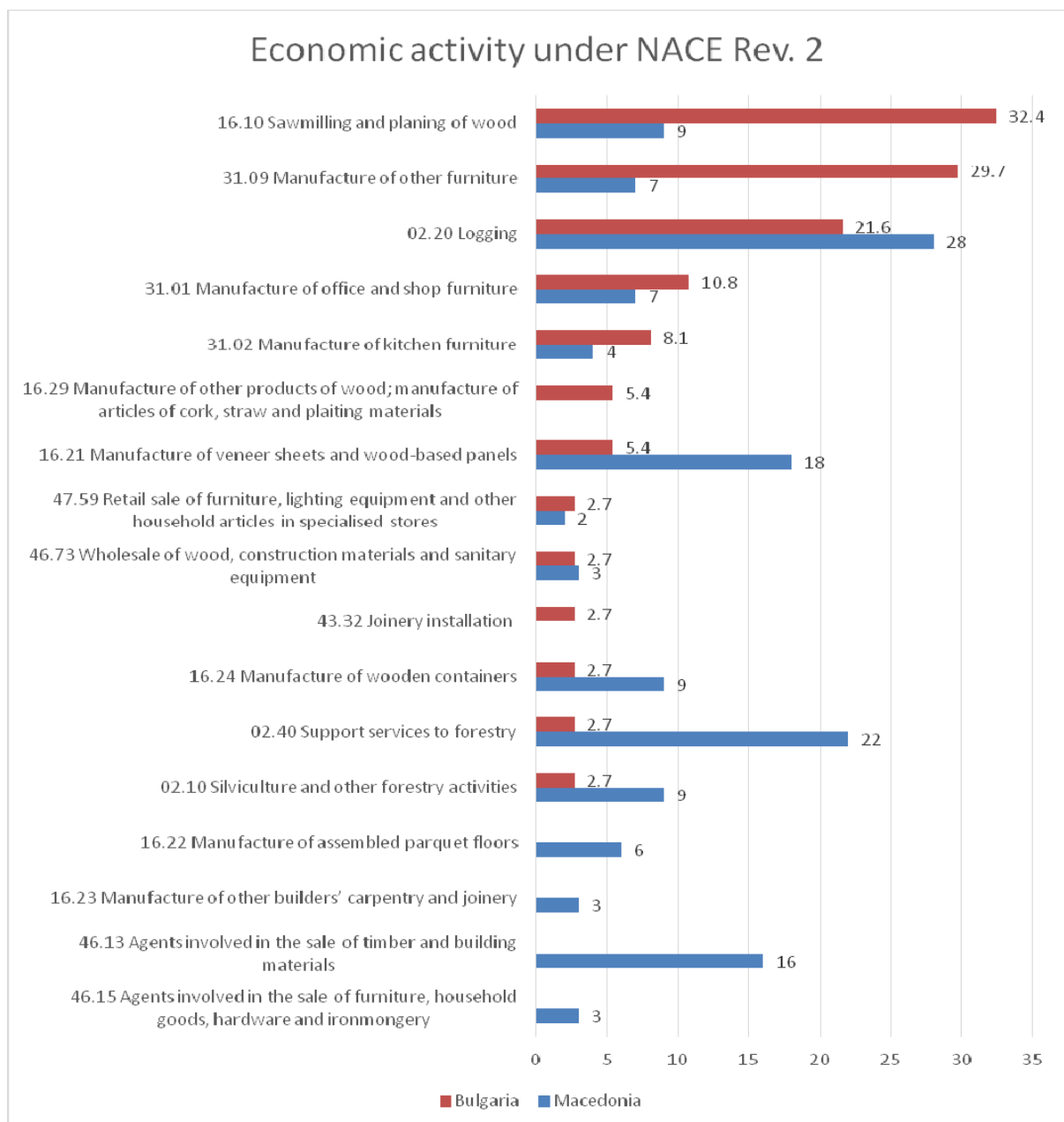


Figure 5

The age structure of the enterprises operation was dominated by those, established in the period 2001-2010. 38,4% of the Bulgarian ones have been operating for less than 16 years. The biggest share of companies participating in the study in Bulgaria were started in 2011 or later (43, 4% against 28,8% in Macedonia) (Figure 6).

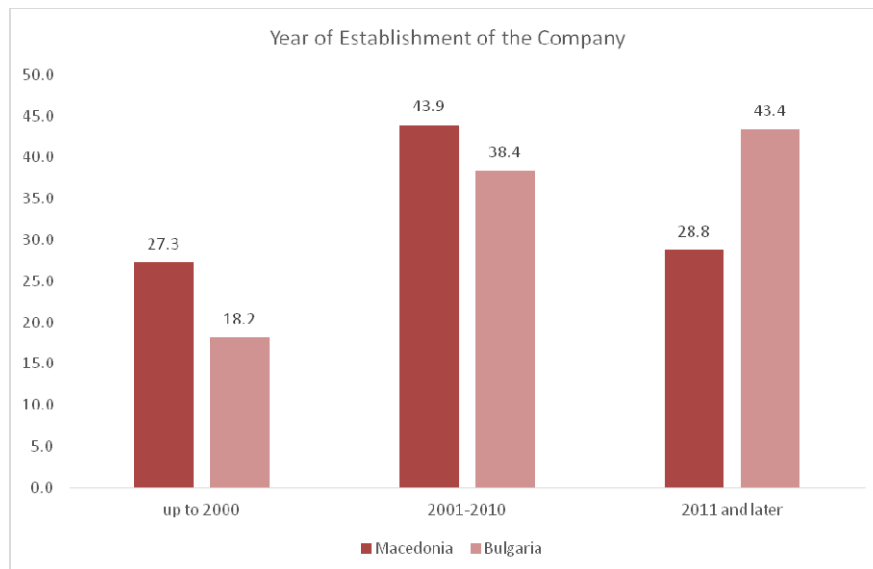


Figure 6

All of the surveyed enterprises in Bulgaria were private ones, while in Macedonia 14,3% of them were public (Figure 7).

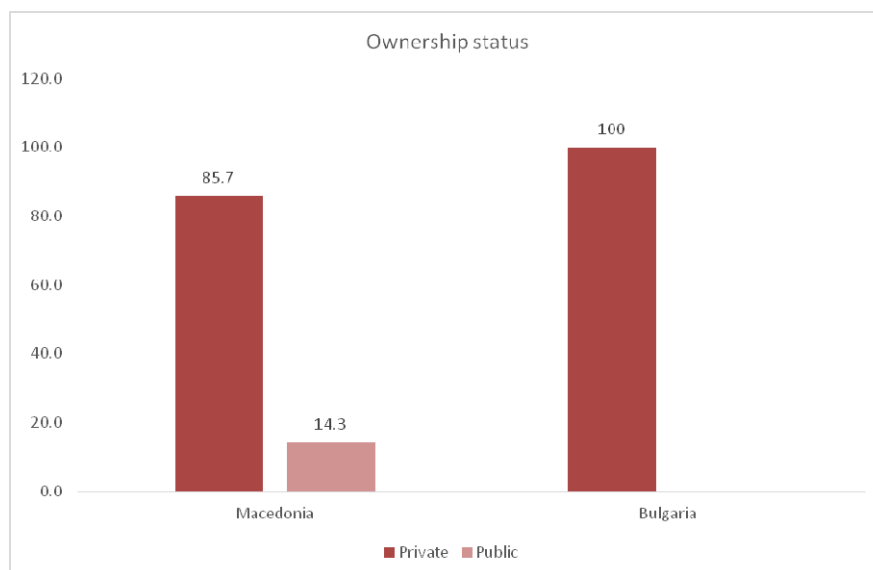


Figure 7

The observed companies were predominantly local (with either Bulgarians or Macedonians being the owners). In Macedonia, there were some cases of foreign or mixed ownership (Figure 8).

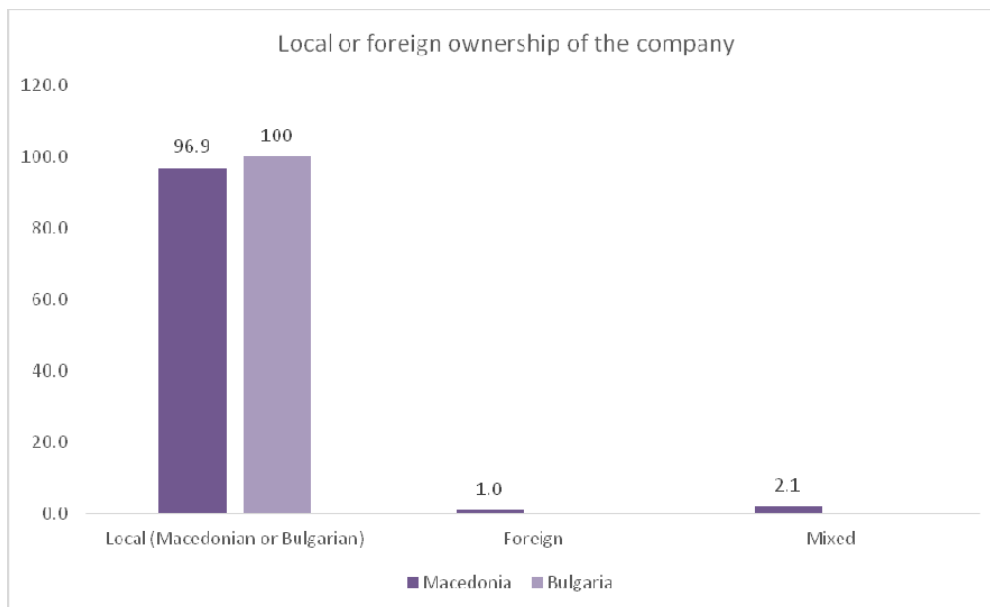
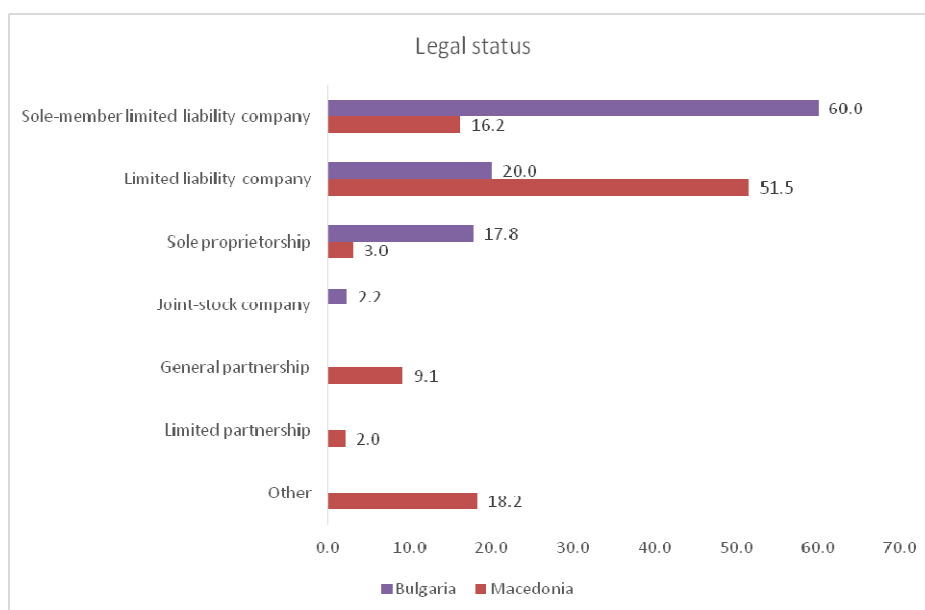


Figure 8

The legal status of firms observed the organization's in Bulgaria are predominantly sole-member limited liability companies (60%) and in Macedonia, where 51.5% of the surveyed enterprises were limited liability companies. Since in Macedonia there were public companies, they answered "other" when asked this question (Figure 9).



(Figure 9)

The connectivity of firms in the observed regions is not well performed as the majority of the organizations in the survey in both countries are independent. In Macedonia, very few companies are part of another enterprise (Figure 10).

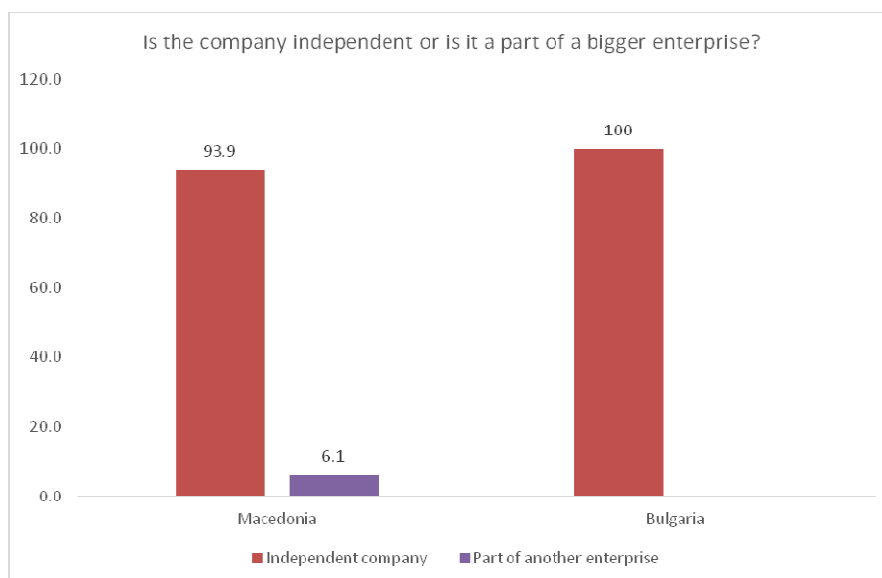


Figure 10

The majority of the businesses in the observed sectors were operating in the years 2014, 2015 and 2016. In Macedonia, those that were not operating were between 2 and 4% of the responding companies and in Bulgaria that percentage varies between 5,3% and 12,2% (Figure 11).

Has the company been operating in the following years?

YES

NO

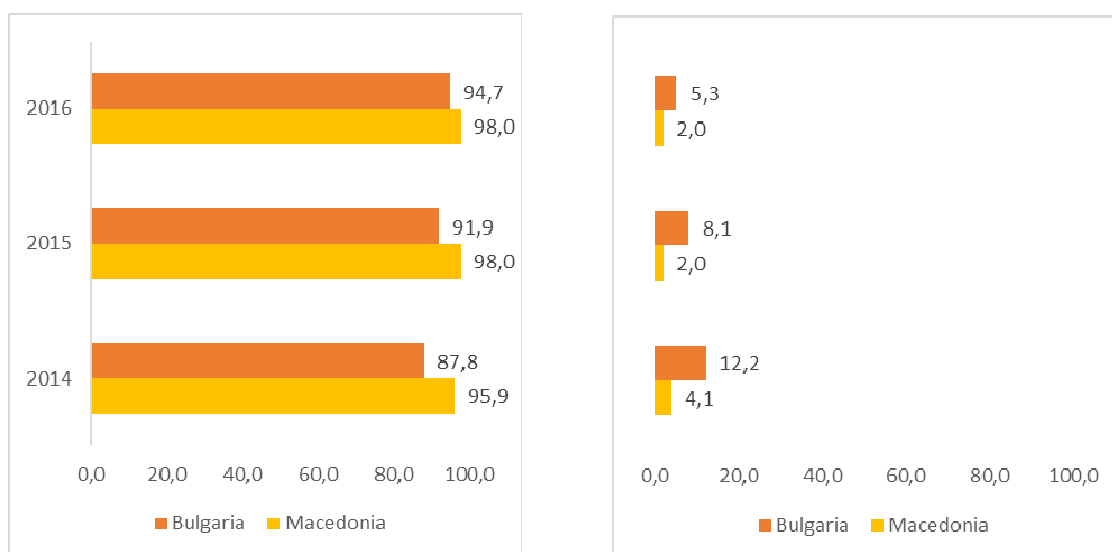


Figure 11

Predominantly the survey enterprises were micro, small and medium. The following data provides arguments for such conclusion: a) Companies that took part in the study in both of the regions typically have assets whose book value is no more than EUR 350 000 (72, 3% and 94, 7% in Macedonia and Bulgaria respectively). In Macedonia, 18, 1% of the interviewed enterprises have a book value of the assets that is between EUR 350 000 to EUR 4 mln (Figure 12).

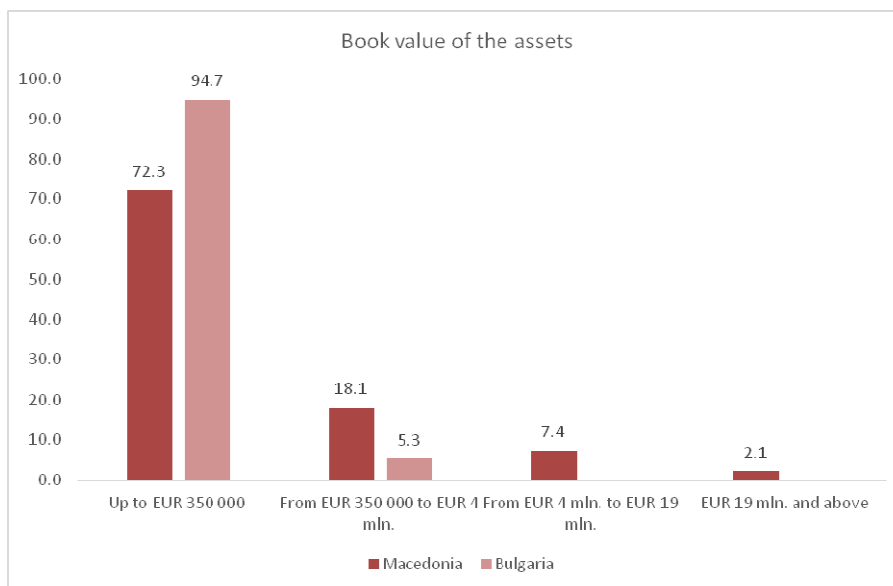


Figure 12

According to the next indicator of the size of the firms the survey says the net sales revenue of the majority (84,3% in Macedonia and 94,6% in Bulgaria) of the companies are small and have revenue which does not exceed EUR 700 000. 6,7% and 5,4% of the interviewed companies in Macedonia and Bulgaria respectively have net sales revenue between EUR 700 000 and EUR 8 mln (Figure 13).

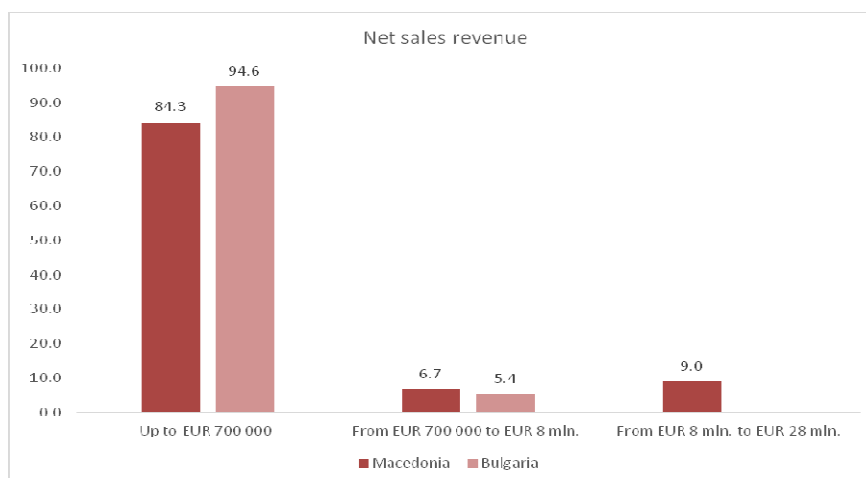


Figure 13

The majority of organizations which participated in the study were micro – about 61 and 65 % of all firms, and small with between 50 and 249 employees were 12,5% in Macedonia and 2,6% in Bulgaria (Fig.14).

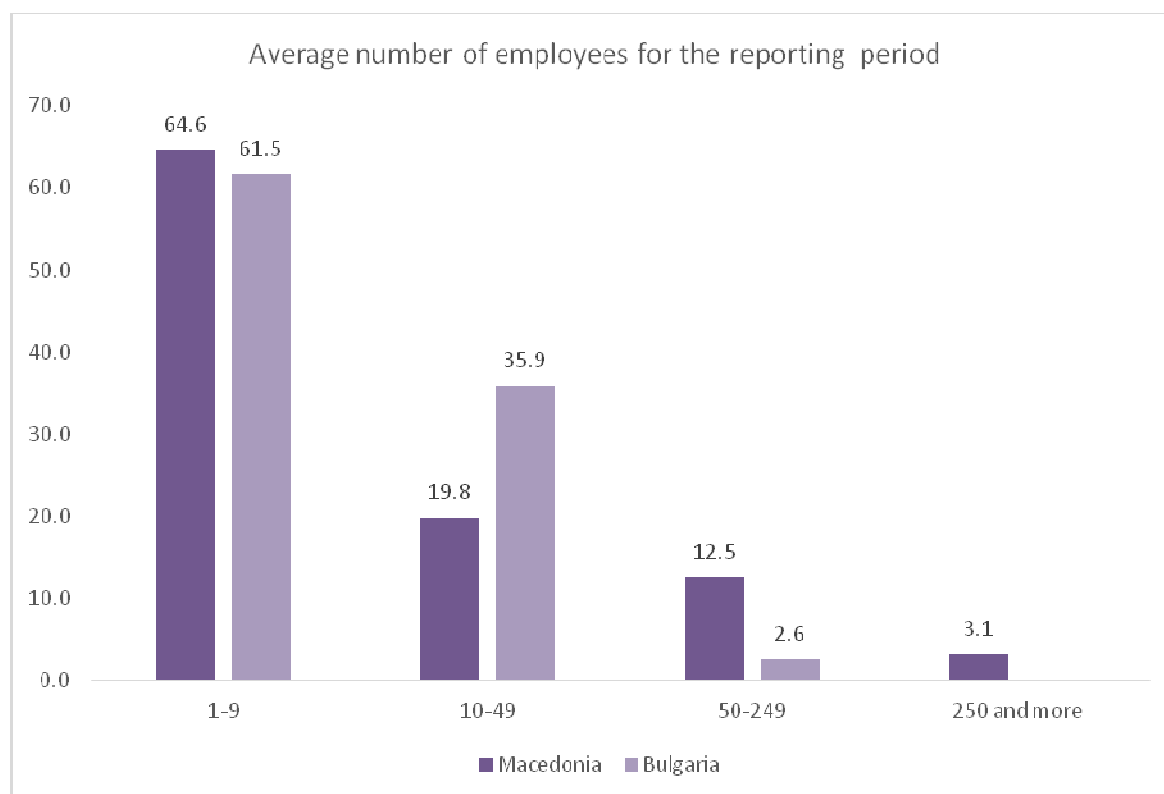


Figure 14

In conclusions, the observed enterprises were predominantly micro, and private, operating for less than 16 years. There are few small and medium size enterprises which operate in last 3 years in wood related sectors according to NACE Rev.2. The majority of the companies that took part in the survey in both Bulgaria and Macedonia have been micro – with between 1 and 9 employees (61,5% and 64,6% respectively). 19,8% of the respondents in Macedonia work in middle sized companies with 10 to 49 workers (against 35,9% in Bulgaria). Dominated observed firms' activity in Bulgaria were sawmilling and plating of wood and manufacture of other furniture, while in Macedonia – logging and support services to forestry, predominantly sole-member limited liability companies.

3. Innovation and cooperation potential of enterprises in the sector

The R&D intensity (share of research and development expenditures expenses of turnover) is commonly accepted indicator of the innovation activity in the businesses. The companies dominated in the observed sectors in the regions of Kyustendil and Blagoevgrad in Bulgaria and Northeastern,

Eastern and South-eastern planning regions of Macedonia spend 0% of their turnover on R&D (55,7% of the businesses in Macedonia and 84,6% in Bulgaria). 30,9% of the Macedonian companies spend up to 0,3% of their turnover on R&D (against 12,8% of Bulgarian organizations, affected by the EU funds. (Figure 15).

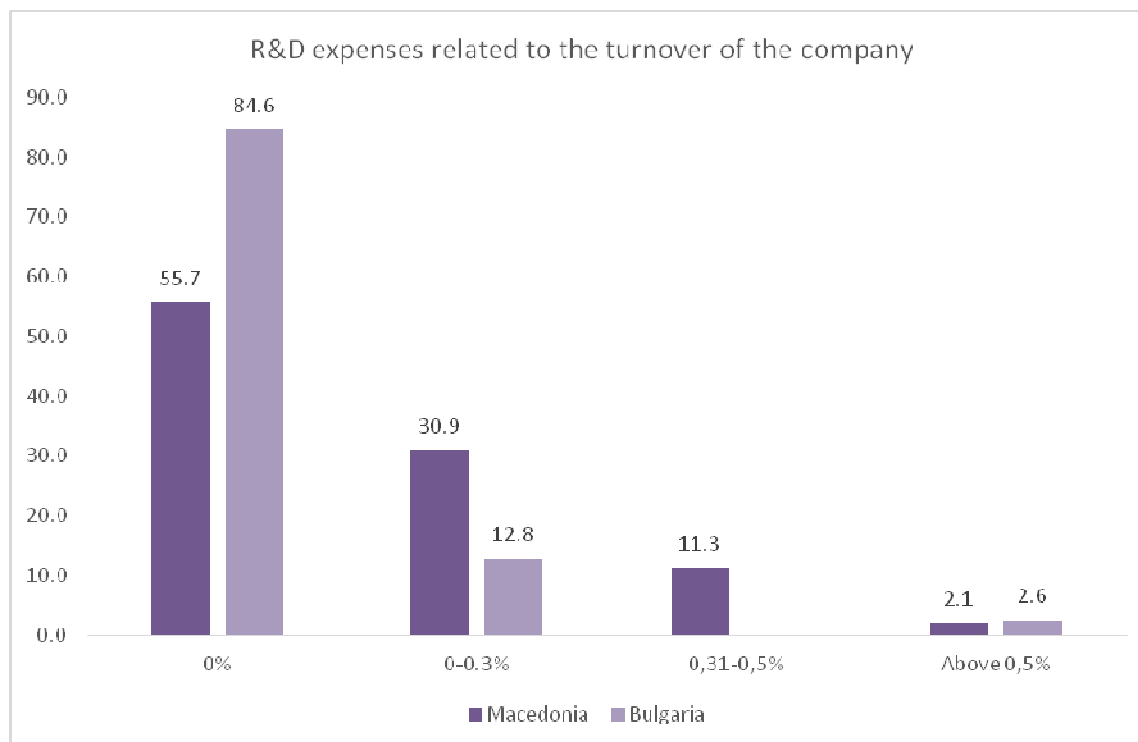


Figure 15

The innovation policy of the firms is dominated by objectives for introducing novelties in the observed enterprises in Bulgaria in Macedonia like the improvement of the quality of the products, the expansion or maintenance of the existing markets and the reduction of environmental pollution. The surveyed firms realise reducing unit labour costs and energy expenses as well as increasing the flexibility of the production are of high importance in both countries. (Figure 16).

Among priorities in policy making are expansion of the product portfolio, reducing the expenditures on materials, entering new markets or increasing market share, implementing new standards and the removal of products at the end of the life cycle (Figure 17).

Investments in both countries corresponds to their innovation. In the period 2014-2016, about 76% of the enterprises in Macedonia that were interviewed invested mainly in acquiring new machines and equipment, around 48% in staff trainings, 41% in advertisement and 39% in buying computed hardware. In Bulgaria, the companies as well were spending the most on new machines and equipment, staff training, market research advertisement and computer software (Figure 18).

What are the main aims of your enterprise when introducing technological novelties? What priority are they given?



Figure 16

What are the main aims of your enterprise when introducing technological novelties? What priority are they given?

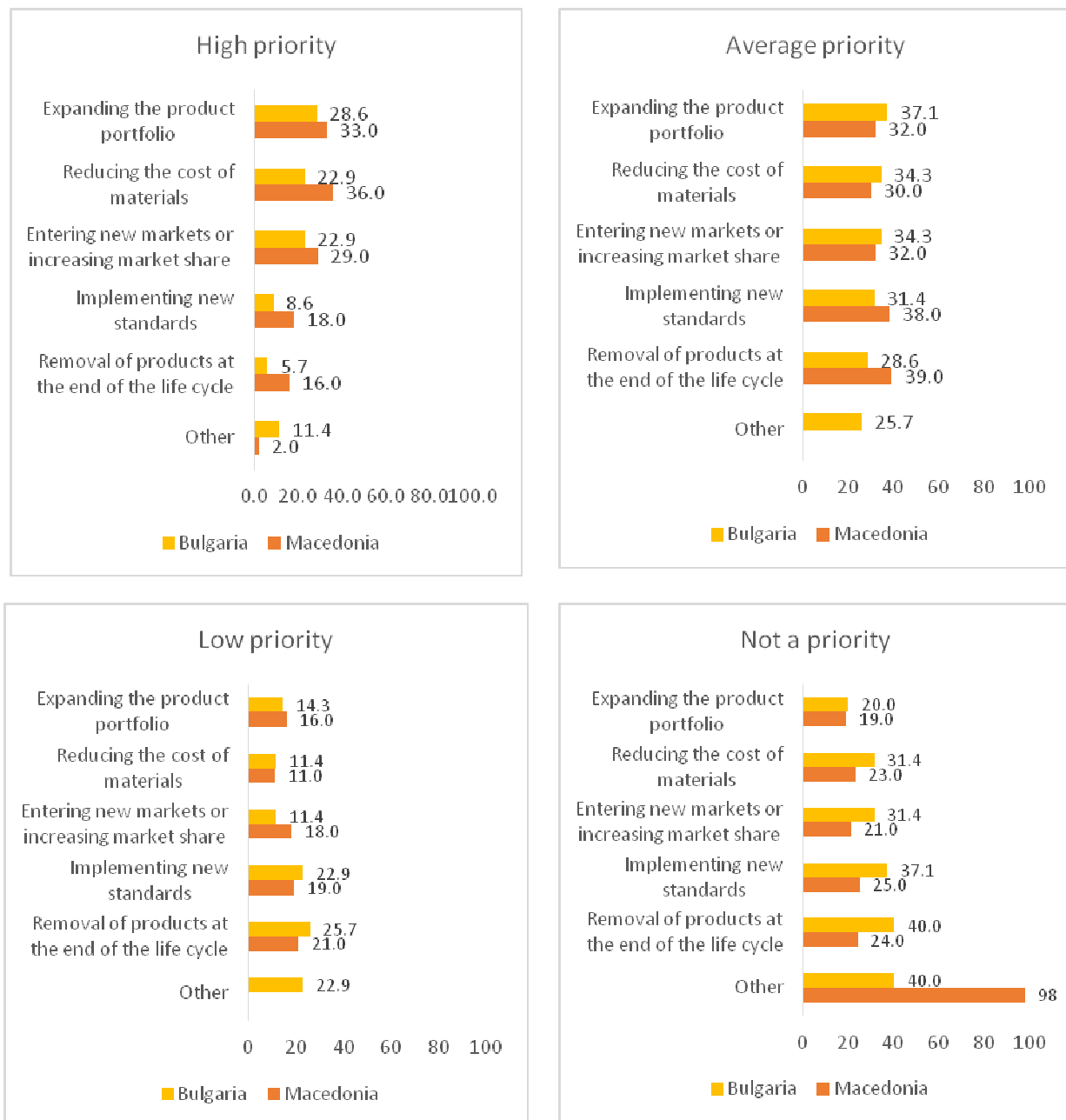


Figure 17

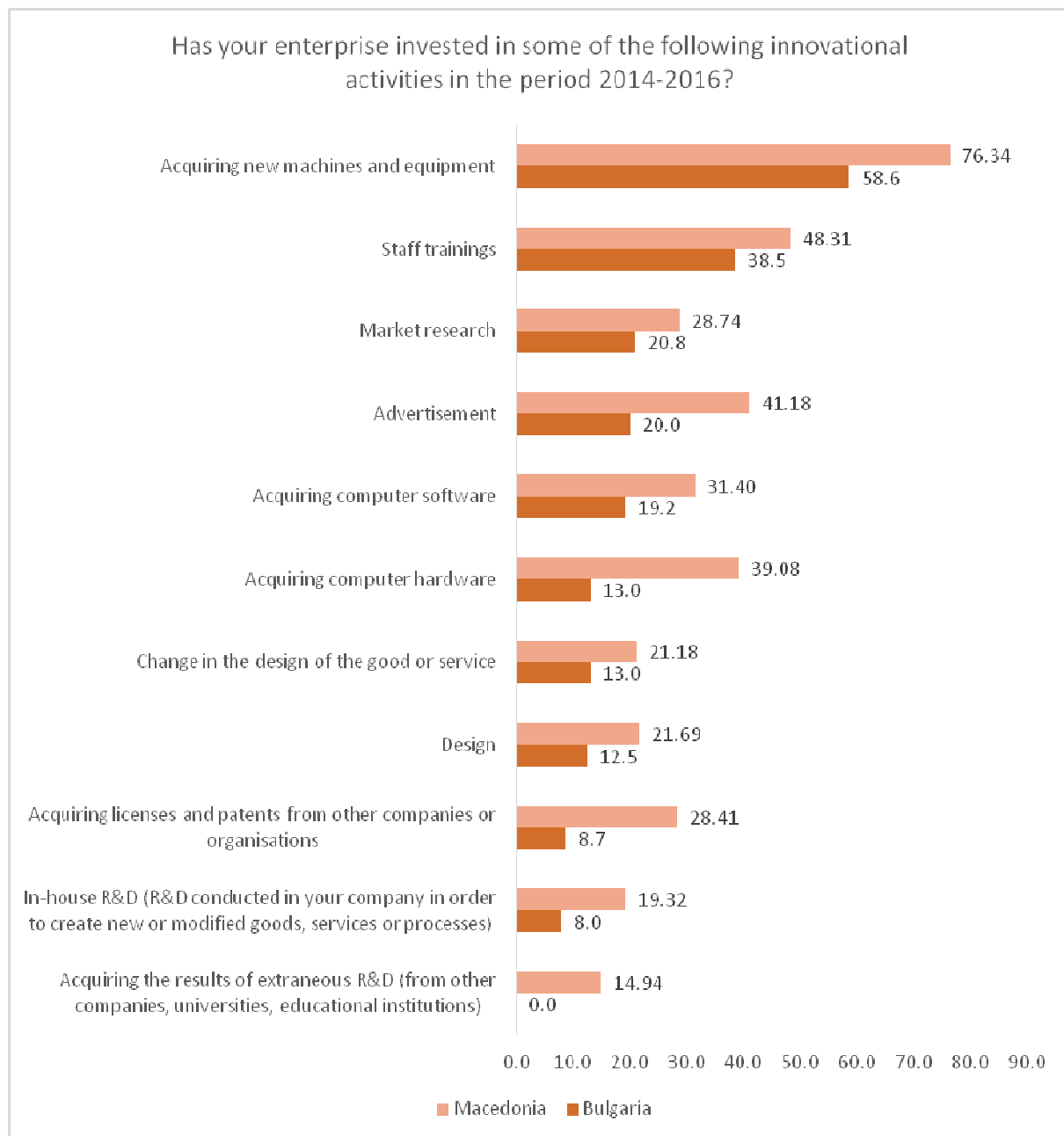


Figure 18

A vast majority of firms interviewed provided information they have been innovative during 2017. In Macedonia, more than half of the organizations that took part in the survey answered that they have introduced technologically new or modified products in the last three years. In Bulgaria, 76,5% of the firms said that they have not introduced technologically new or modified products to the market. That could be related to the low R&D activities that the companies undertake, traditionally low level of innovation intensity of the sector and low level of novelty in innovations taking place in the firms (Figure 19).

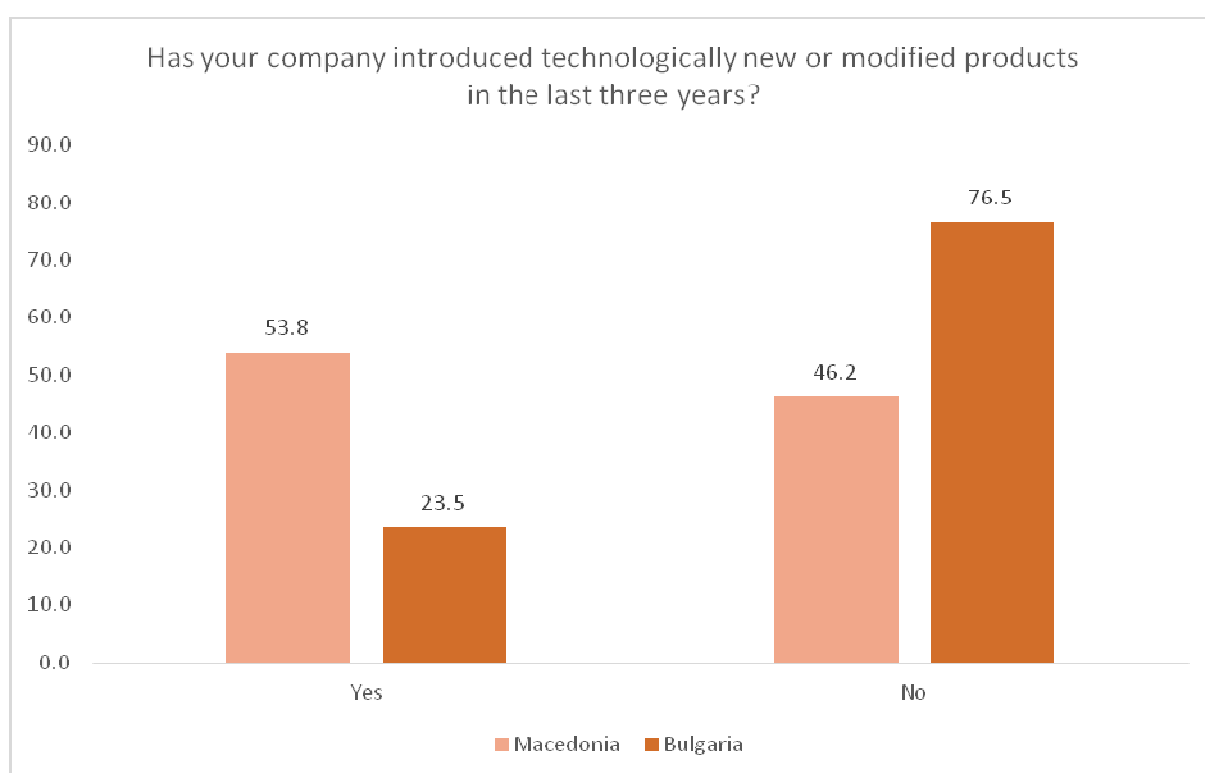


Figure 19

When Bulgarian companies launch a technologically new or modified product, they have acquired the know-how related to it inside their organization. In Macedonia, enterprises acquire that either in house, when cooperating with other firms or institutes or directly from other enterprises or institutes (Figure 20). The low level of connectivity results in low level of their innovations of micro and small enterprises.

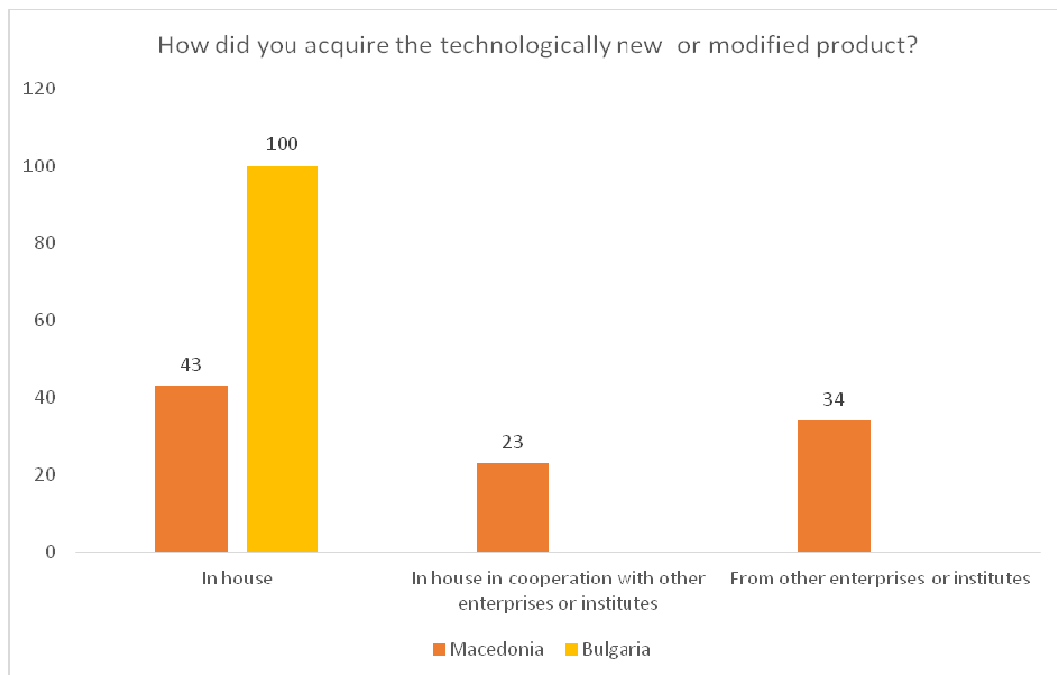


Figure 20

There is one more argument the novelty of innovations is low - launching products that are technologically new or modified and are also new to the market is not a common practice in both of the observed regions: the majority of companies have not introduced such in the last three years (Figure21).

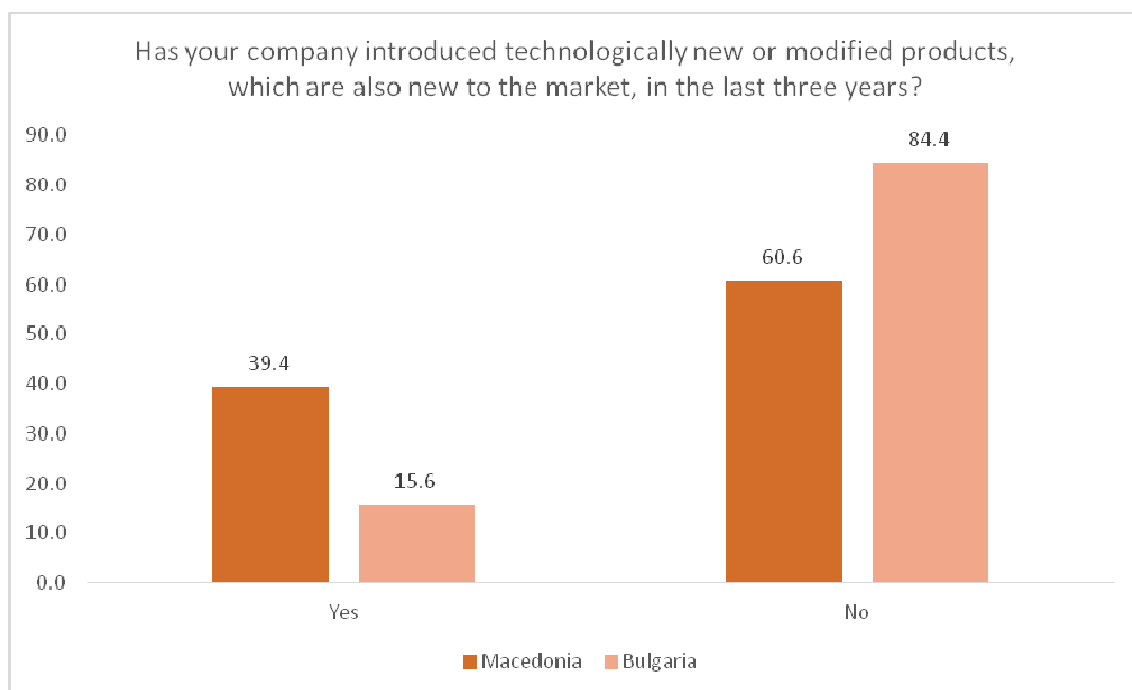


Figure 21

The organizational changes were no radical. The introduced new management techniques that happen in the most in the surveyed companies in Bulgaria are using the Internet and e-mails, electronic data exchange and investing in the development of the staff. Macedonian companies gave analogical answers and there JIT planning systems or similar were also popular (Figure 22).

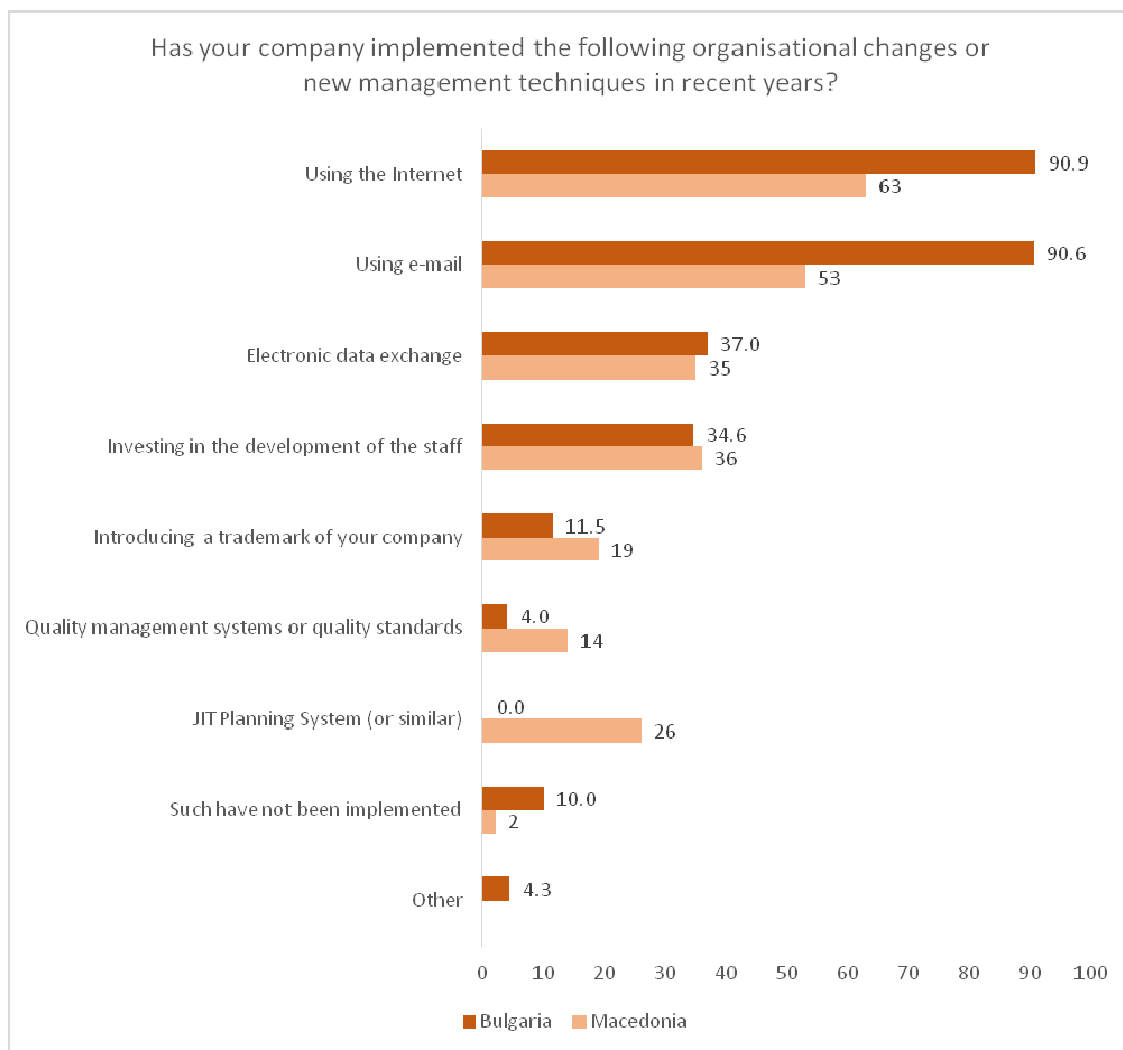


Figure 22

The above question reveals the reasons behind the low innovational activities of the firms in the region. The companies in both countries faced setbacks such as financing, extremely high costs which are in direct relation to innovations, lack of qualified workforce. In Macedonia the enterprises also indicated the great economic risks (Figure 23).

Another area of organizational changes concerns activities that are related to products or services design, engineering, advertising as well as multimedia, graphic and web design in Bulgarian companies most often include the work of internal specialists. Software development and database management are left to external specialists. In Macedonia, the division of the work is the following: engineering and products or services design is also done by specialists from the firm itself. The majority of the other activities, such as graphic and web design and software development are performed by external specialists (Figure 24).

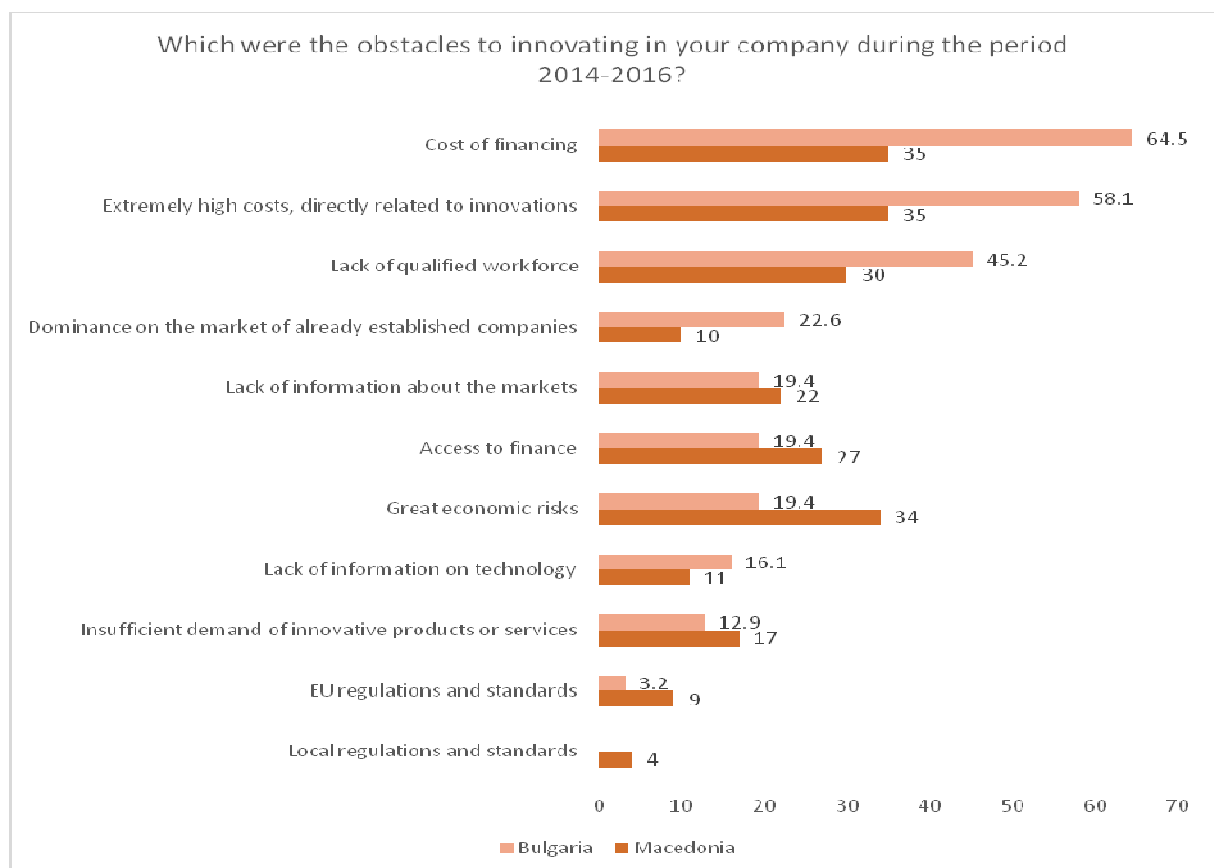


Figure 23

During the last three years what kind of specialists have been engaged with the following activities?

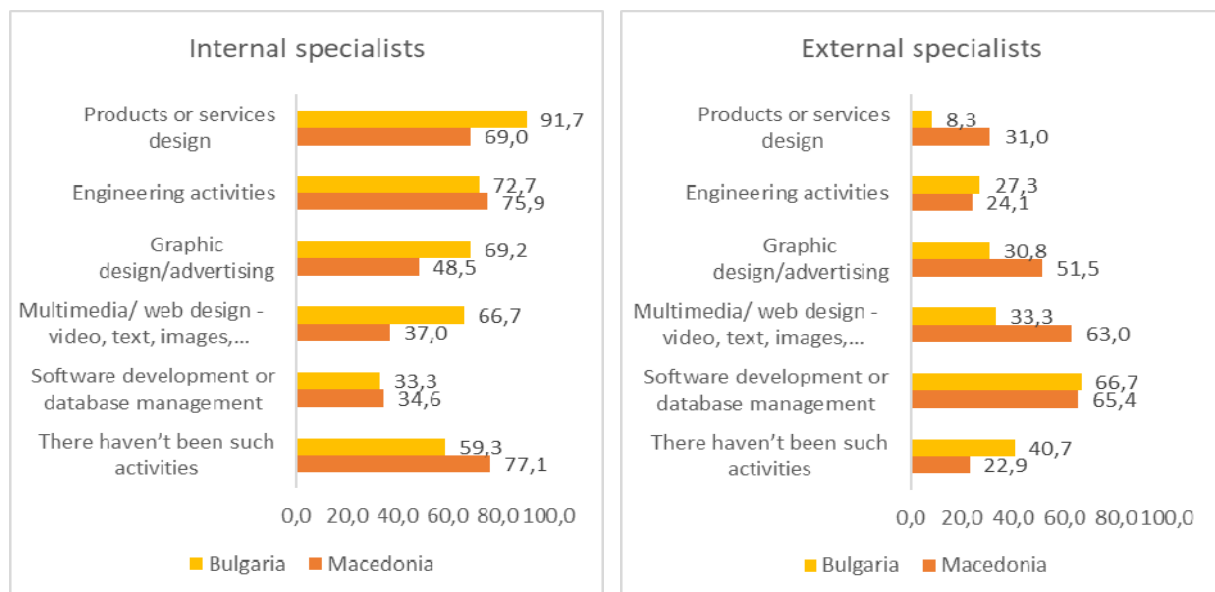


Figure 24

The internal for the firms' sources for innovative ideas are prevailing for both countries. The production process itself is regarded as a very important source of innovative ideas both in Bulgaria and in Macedonia. Bulgarians see the control over the technological process and management bodies and individuals to be of high importance to innovations as well. In Macedonia, the own research and development, the control over the technological process and the market research have a key role in new projects and innovation (Figure 24).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

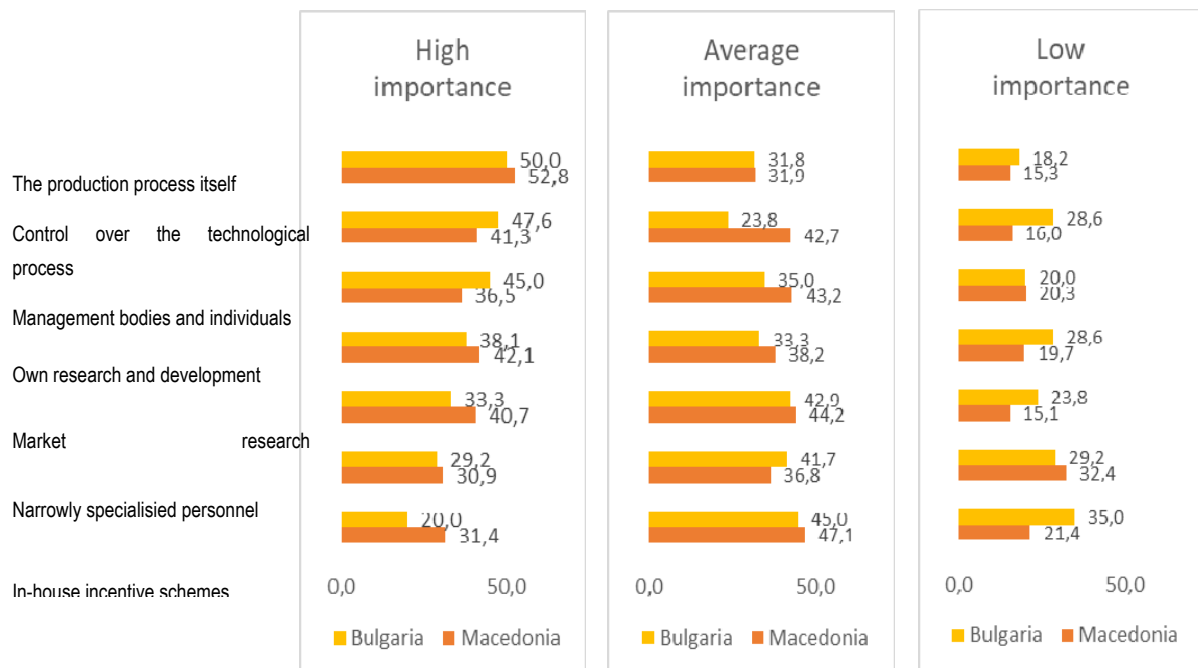


Figure 25

Among external to the firm sources for innovative ideas local innovation programs are regarded of high importance by some of the companies in Bulgaria. Foreign competitors have a minor role when it comes to innovative ideas, both in Bulgaria and in Macedonia. Less important to new projects and technological innovations are fairs and exhibitions, state and foreign innovation programs. This fact indicates that cooperation levels are low and thus companies do not consider them to be important in relation to innovation (Figure 25).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

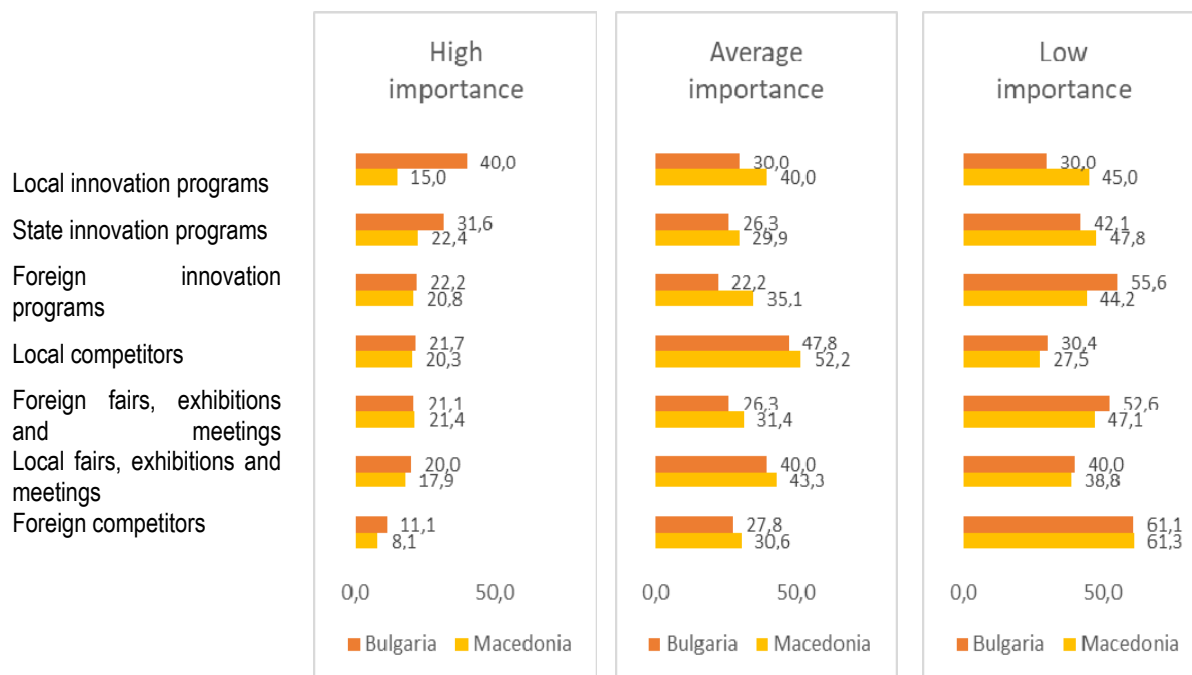


Figure 25

Among the external sources of innovative ideas that are neglected by the firms are many others. The surveyed companies regard the software that they purchase to be of low importance to innovative ideas. Newly purchased equipment from local or foreign manufacturers is of average importance (Figure 26).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

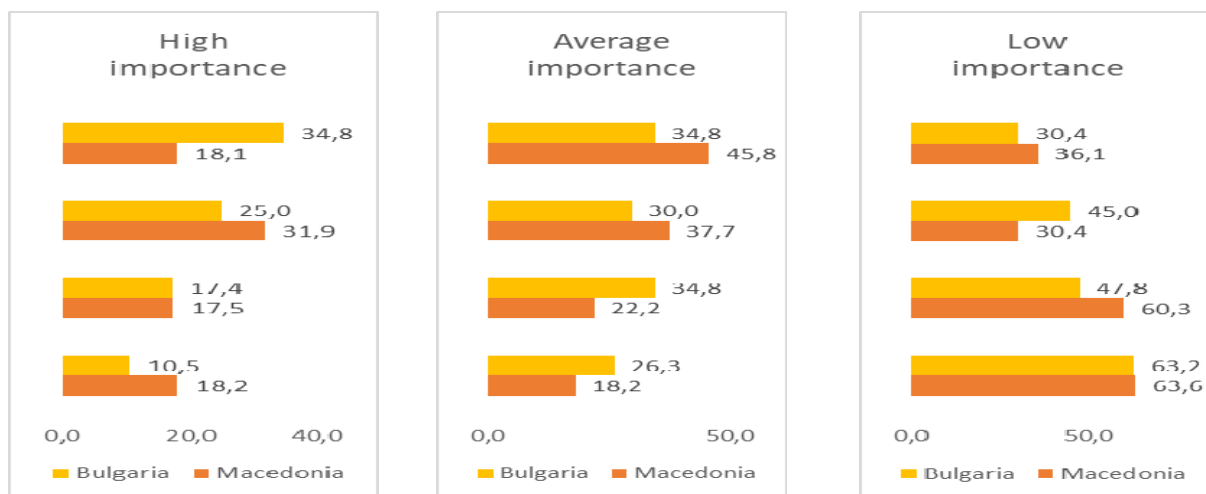


Figure 26

The fact the foreign and local customers and suppliers are considered to be either of average or low importance to innovative idea and so are local consulting companies, and the foreign consulting companies are not perceived as an important source of ideas for innovation shows the innovation system of the region is weak (Figure 27).

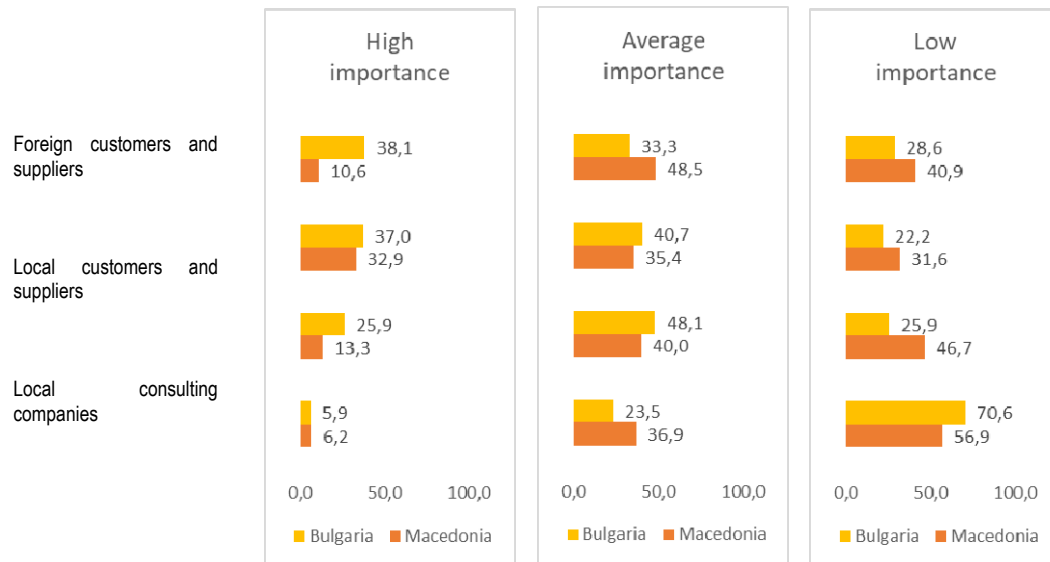


Figure 27

The next argument to the above statement is that research institutions are predominantly rated as a source of low importance to the new projects and technological innovations and innovative ideas related to them. This could be attributed to the registered low R&D activities as well as to the low levels of cooperation between the business and the institutions in the observed sectors (Figure 28).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

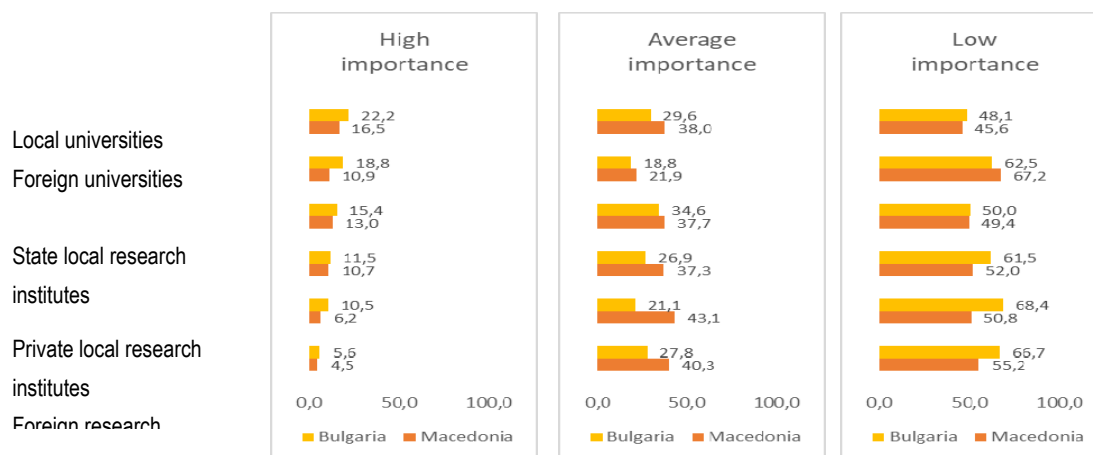


Figure 28

Companies in Bulgaria and Macedonia neglect another important for innovating factors - computer-based networks and patents from other countries are of low importance to innovative ideas. The importance of occupational safety and health regulations, environmental regulations and product standards is split into equal parts for the different firms: some regard those factors as vital, others as having average importance, others as insignificant (Figure 29).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



Figure 29

Enterprises that participated in the survey generally believe that innovative ideas might come from their business connections, from advice to the company, from meetings and conferences as well as from trade associations. All those factors were rated as having average importance by approximately half of the firms both in Macedonia and in Bulgaria. (Figure 30).

To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

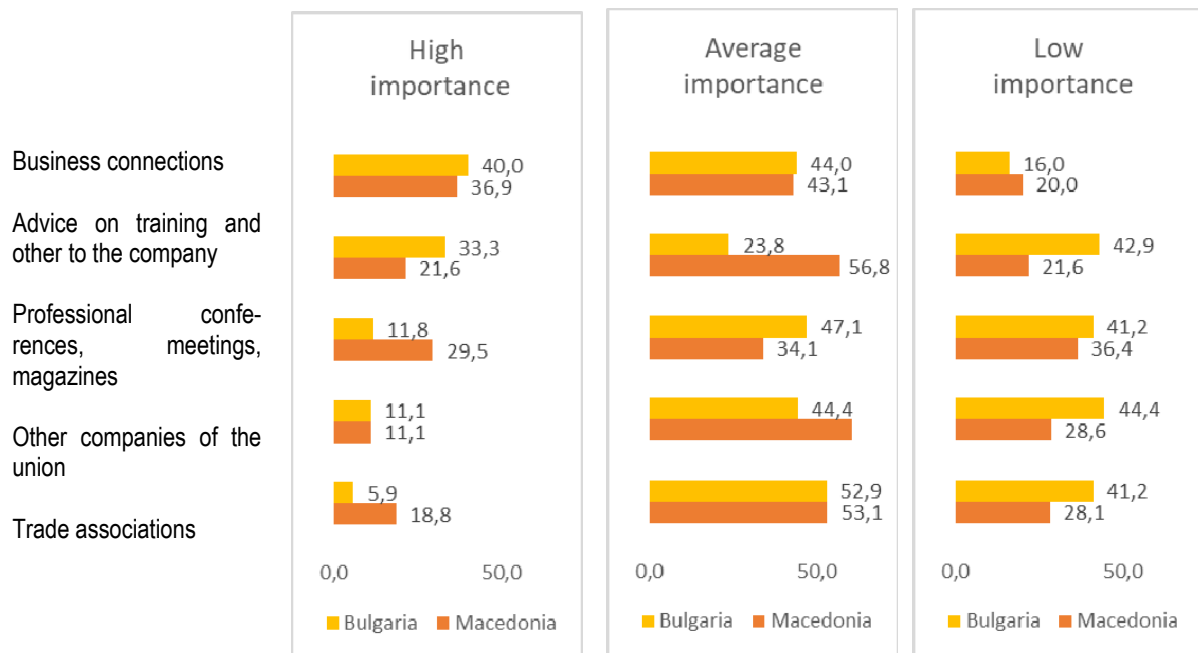


Figure 30

Concluding the above results it could be assumed level of innovativeness and respective policies has to be on focus in the process of fostering economic cooperation in the region. It has to be taken into account the R&D intensity in the observed firms is very low. The novelties introduced are incremental, produced in-house, no any radical innovations. The sources of ideas for innovation are internal.

Innovation policy is very general. these characteristics correspond to the size structure of the observed enterprises, defined in previous section.

3. Digitalization

ICT usage is a precondition for contemporary activity of any firm. The basic indicators concerning digitalization include availability of computers, Internet usage, type of connections, purposes for Internet usage, availability of website.

The most companies in the observed sectors use computers. In Macedonia 17,3% of the enterprises answered that they do not use a computer and in Bulgaria that percent was 7,9% (Figure 31).

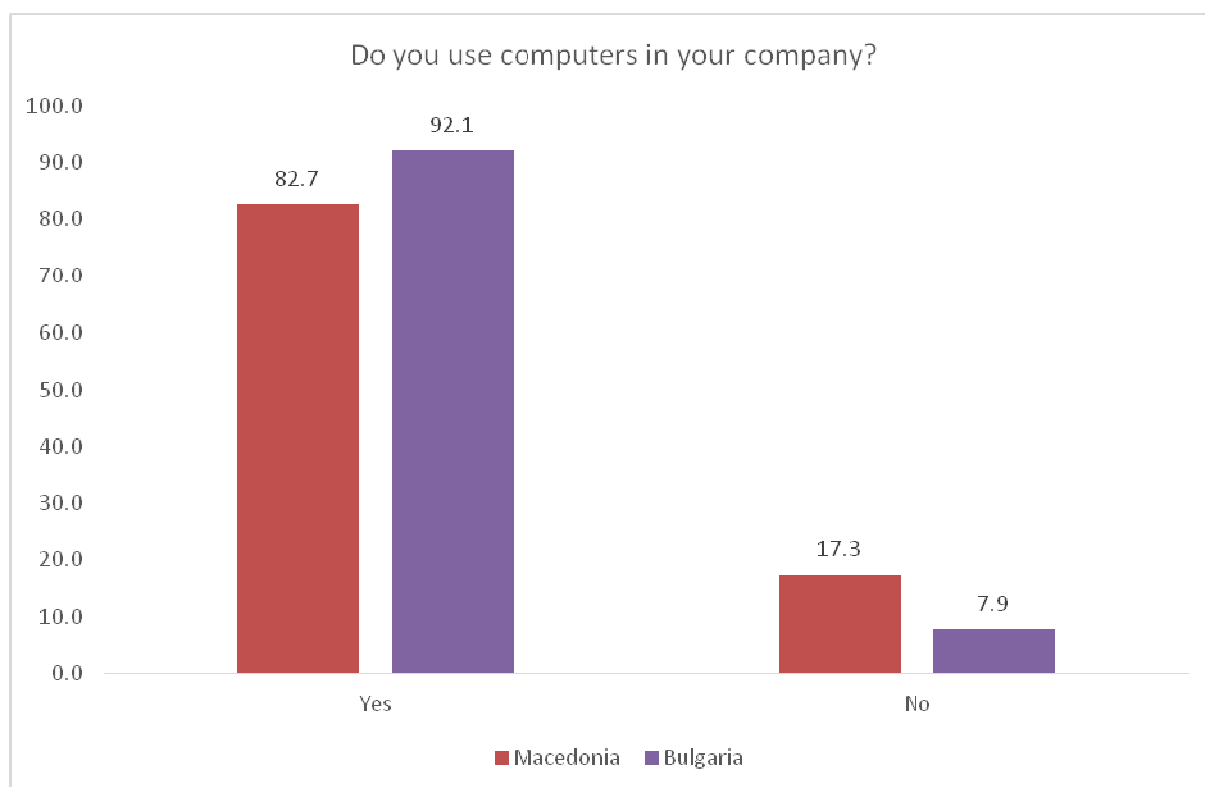


Figure 31

Internet penetration is approximately well presented in the surveyed businesses, but there is a room for better performance. In Bulgaria, 7,9% of the interviewed companies do not use it, while in Macedonia that percentage is 22,4. (Figure 32).

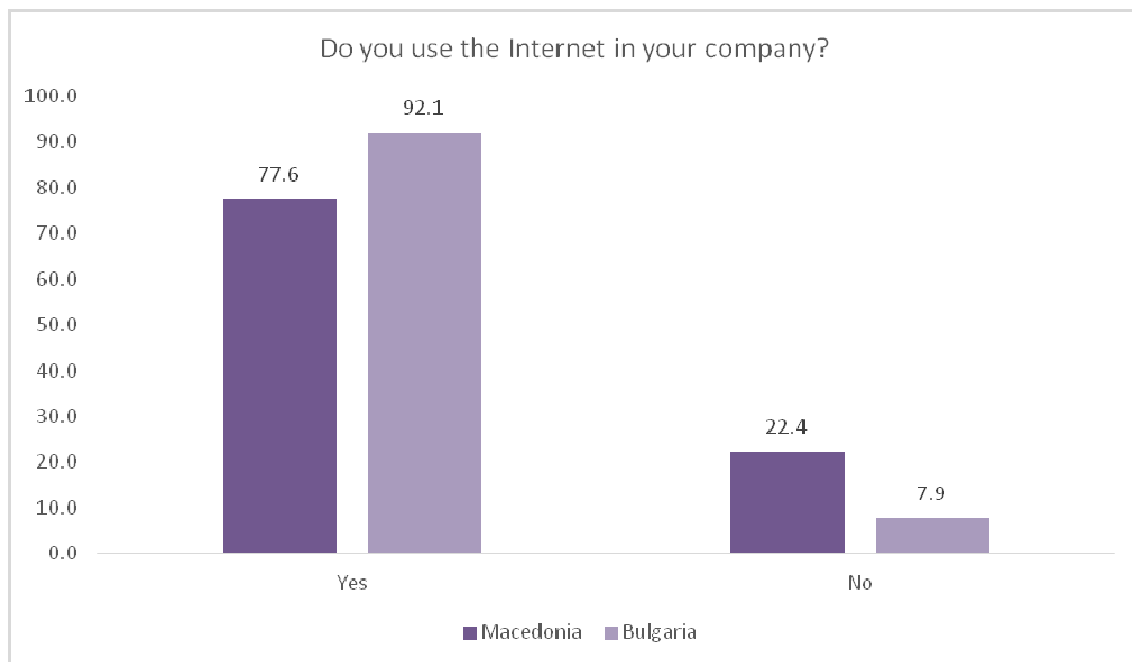


Figure 32

The companies which use the Internet mostly have a fixed or broadband connection (observed firms in Macedonia and Bulgaria - 66,2% and 61,8% respectively) (Figure 33).

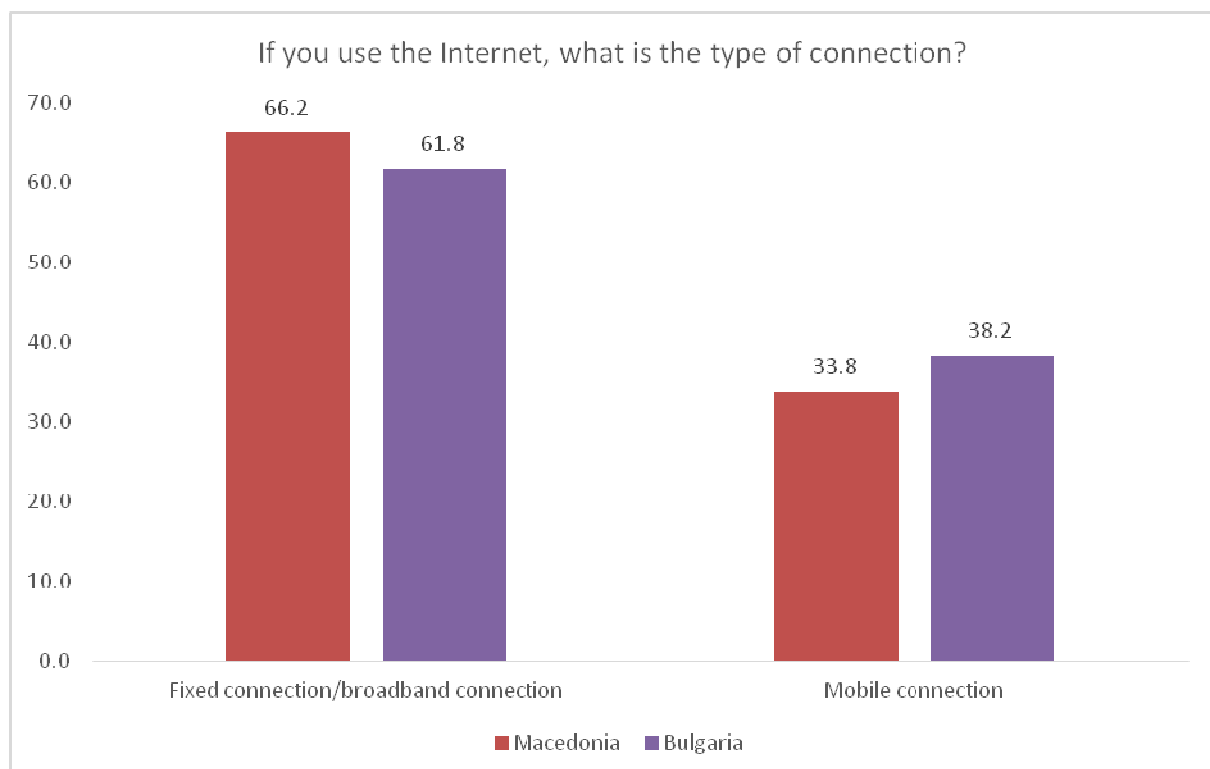


Figure 33

The most widespread use of the Internet amongst the surveyed companies is for interaction with public institutions. This is valid for 91,4% of the enterprises in Bulgaria and 48% of those in Macedonia. Another purposes of Internet usage is electronic invoice, followed by social media and automated relations to the customers or suppliers of the firms. Some of the companies have online shops or use cloud services. ERP or CRM systems and information security policies are less popular (Figure 34).

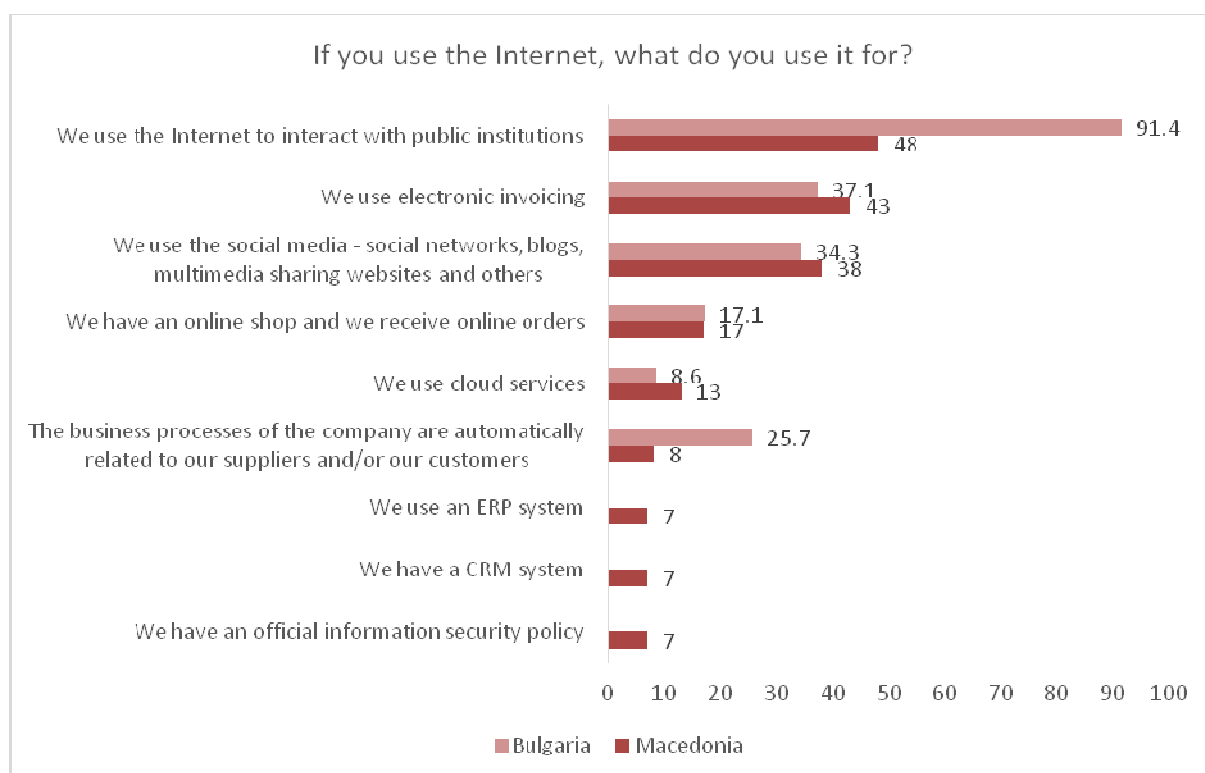


Figure 34

A common barrier to connectivity of the firms is that more than half of the interviewed companies, both in Bulgaria and Macedonia, do not have websites. (Figure 35).

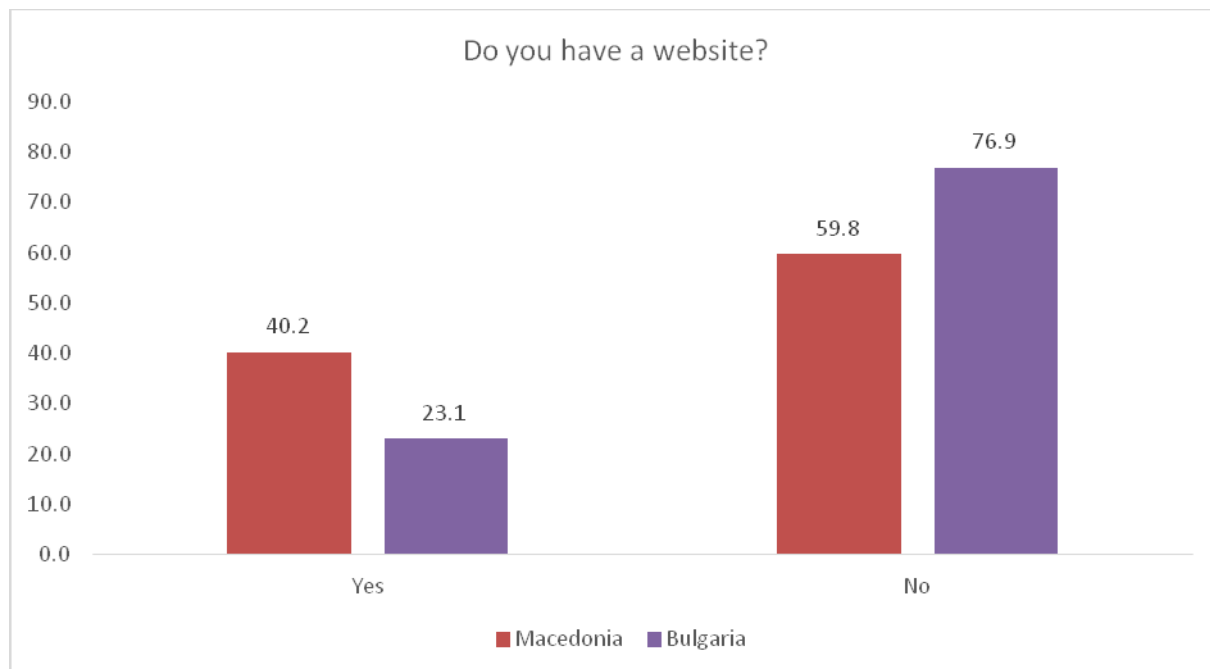


Figure 35

In conclusion it could be summarized that in spite firms from the sector in Bulgarian side are better performed in ICT usage there is a lot of room for improvement for all firms surveyed. The typical firm in the observed population has computers, and use Internet for connecting with public institutions, but has not any website.

5. Export intensity

Intensity of foreign trade of the firms in the sector is an indicator for economic integration in any region.

The survey says export intensity of the majority of the interviewed enterprises is low. 87,7% in Macedonia and 84,6% in Bulgaria export goods or services with a value which equals up to 20% of their turnover. The export of only 12,8% of the Bulgarian companies which participated in the survey equals a value which is between 21 and 49% of their turnover. The export of only 8,6% of the companies from Macedonia that took part in the study equals more than 50% of their turnover (Figure 36).

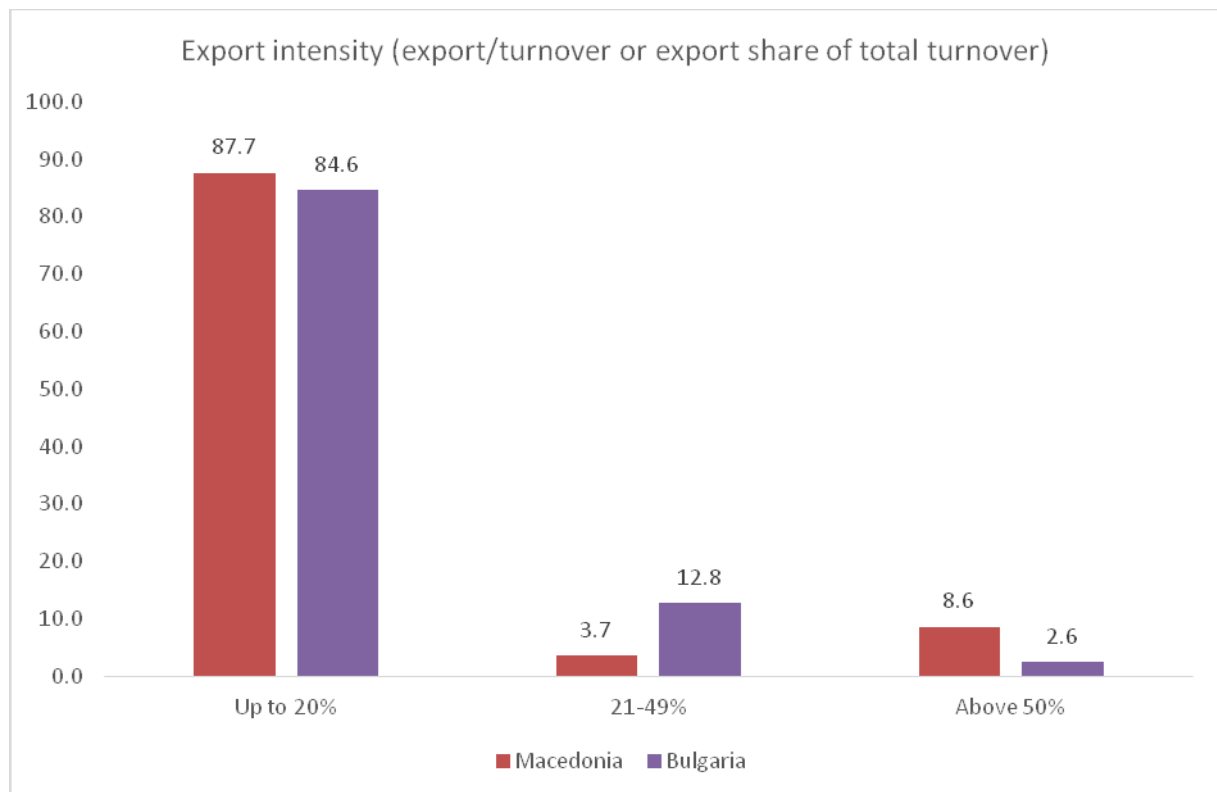


Figure 36

Another indicator about level of cooperation between firms in crossborder region is availability of suppliers and costumers in the nabour country.

The data obtained from the survey says the most of the firms do not have suppliers from the neighboring country: 97,1% of Bulgarian companies do not have suppliers from Macedonia and 84% of Macedonian businesses are not supplied by Bulgarian partners (Figure 37).

Similar is the state of the art with customers. Approximately 90% of the interviewed companies do not have customers from the neighboring country. (Figure 38). On the other hand, the local authorities and all the stakeholders in the forestry, logging, wood, paper and furniture production and trade might enhance cooperation between the regions through appropriate policies and initiatives.

These figures inform about low level of cooperation, which could be a result of the influence of many factors. On the first place it is the dominating micro size of the firm and very limited average number of suppliers and customers for each of them.

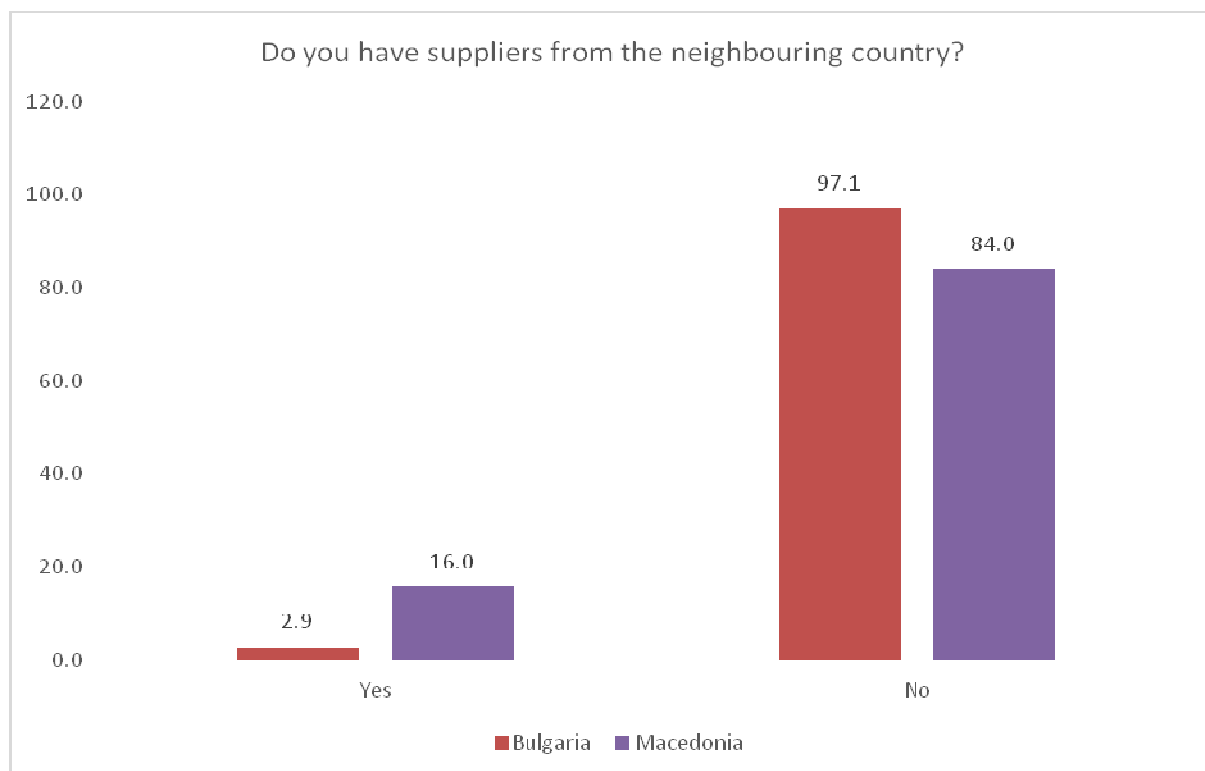


Figure 37

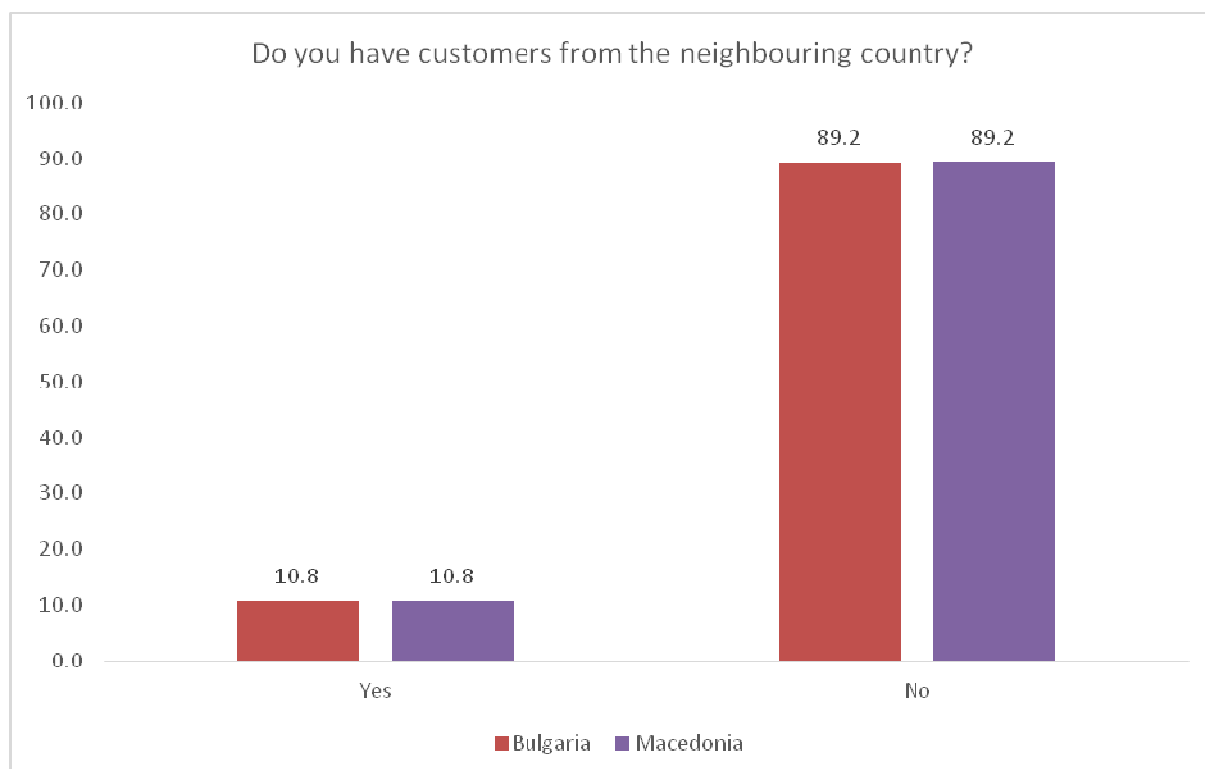


Figure 38

The above results may be influenced by the fact that in Bulgaria most of the customers of the interviewed companies are end consumers - 42,4% (versus 23% in Macedonia) and that In Macedonia the majority of enterprises (48%) sell to the logging division (versus 24,2% in Bulgaria). A quarter of all firms sell out to the manufacturers of furniture.

International cooperation is influenced strongly by the expenditures on transportation. In Bulgaria, 34,6% of the companies have delivery costs that are equal to 5 to 10% of the total production value. In Macedonia, the delivery costs of more than half of the com

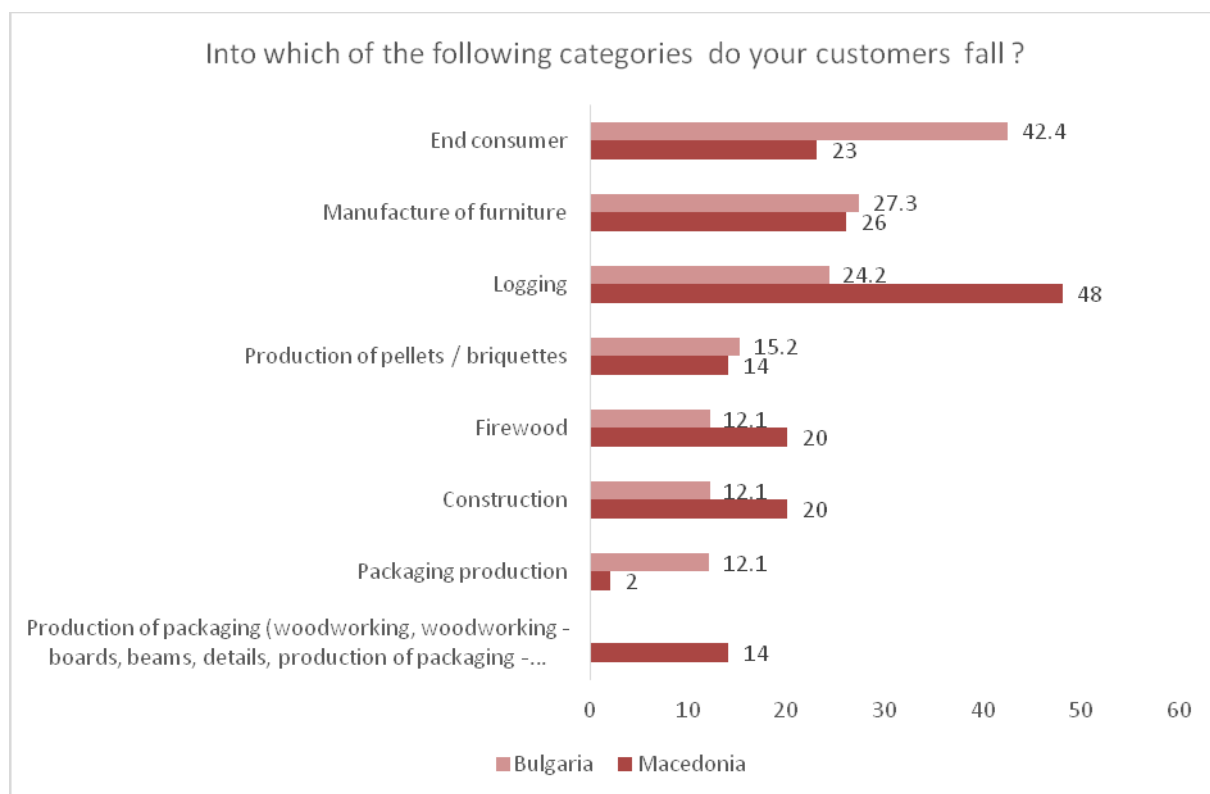


Figure 39

In conclusion it could be summarised the export intensity of the majority of the firms observed is on low level. There is a lot of room for activities to use the potential for economic integration in the region, starting from optimization of the transportation expenditures..

6. Key findings

The key findings from the survey could be summarized as follow:

The majority of the companies in the sectors observed in the regions of Kyustendil and Blagoevgrad in Bulgaria and Northeastern, Eastern and South-eastern planning regions of Macedonia are micro, small and medium sized companies. Their turnover of that companies is usually less than 700 000 euro and the majority has employees between 1 and 9 people (62-65%). In majority of the cases the value of the assets is up to 350 000 euro. The legal form of the companies is solo-member limited liability company or limited liability company. Their managers are predominantly male, and ageing.

The prevailing share of enterprises is not innovating, or is innovating with no or low level of novelty. The digitalisation provides opportunities for increasing competitiveness if companies develop their website. By now the key reason for using Internet is interaction with public administration and electronic invoices. Rarer the companies use internet for social media and blogs (around one third). Some of the companies have online shops or use cloud services. ERP or CRM systems and information security policies are less popular. Connecting as much of the firms as possible to the Internet might prove to be efficient (when it comes to maintaining the relationships with customers and suppliers) and eventually profitable for the organisations in the observed sectors.

The innovation policy provided shows the most important aims of the enterprises in Bulgaria and in Macedonia when they introduce technological novelties are as follow: the improvement of the quality of the products; the expansion or maintenance of the existing markets and the reduction of environmental pollution. Reducing unit labour costs and energy expenses as well as increasing the flexibility of the production are of high importance in both countries, too. The innovations realised are with a low level of novelty, using predominantly in-house sources for innovative ideas. In general, the cooperation levels between enterprises from the forestry sector in the both countries across boarder region are low. Their representatives would like to increase the cooperation that will contribute in increasing the innovativeness and competitiveness in the region.

Conclusion

The level of innovation of enterprises in the Balkan region, characterised on the case of a survey of 1941 enterprises from the forestry sector on cross border region between Bulgaria and Macedonia in 2017, is low. Approximately good level of internet penetration is accompanied with a low level of ICT usage for business activities (digitalization). The level of trade between both countries is low, showing

low level of cooperation, nevertheless the potential and willingness for cooperation and innovative initiatives is high which is a good precondition for cooperation and integration in the region. On other hand it has to be considered necessity of future research for developing such cooperation in order to achieve better economic performance in the Balkan region.

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