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INTRODUCTION

Migration, poverty, the aging of the population, the drop in its educational level, unemployment - these are the social problems that Bulgaria and Macedonia face in their border regions. In today's reality of accelerating the creation and use of new technologies and concomitant globalization, these problems are accompanied by worsened competitiveness and insufficient access to markets for businesses in the region, problems noted in European Commission documents. These problems are compounded by the proven negative trend of continuing fragmentation of business units in most industries in the region's resource-rich forest sector.

The joint Bulgarian-Macedonian interdisciplinary project CB006.1.31.070 "Innovative Initiatives for Cooperation in the Border Region", co-funded by the European Union through the INTERREG IPP Cross-Border Cooperation Program Bulgaria-Macedonia 2014TC16I5CB006, is dedicated to contribute to solving these problems in the forestry sector. The project is an initiative of the Bulgarian Academy of Sciences and the Macedonian Academy of Sciences and the Arts. Its specific objective is to improve the competitiveness of regional business in the Blagoevgrad and Kyustendil regions in Bulgaria and in the Southeastern, Eastern and North-Eastern regions of Macedonia through joint innovative cooperation initiatives.

Based on the analysis of data from the official sources of the European Commission, chapter one summarizes the global and regional challenges faced by Bulgarian and Macedonian policies in the respective sectors of the forestry sector. One of the significant ways to overcome the low level of innovation and the poor competitiveness of the forestry sector in the border region is the implementation of modern forms of innovation cooperation. Different forms of innovation co-operation are presented in this way, by presenting and summarizing the experience in Bulgaria and in the border region.

The second chapter is devoted to the results of the survey on the innovations and competitiveness of forestry enterprises in the cross-border region carried out by the project on the basis of a single survey carried out by the Bulgarian side of Global Metrix EOOD and Rébot – Skopje. The aggregate of surveyed enterprises in the region consists of a total of more than 2,500 enterprises. Respondents identify their needs for improving competitiveness as these requirements are laid down as requirements for the content of a virtual consulting office and a virtual learning platform, taking into account also research results of good world practice in solving the problem. A special focus on observation is the state of women in this sector. The third chapter makes comparison the responses of the business representatives on both sides of the border. Finally some conclusions are drawn.

The implementation of this project is thanks to the close cooperation between the two teams – the one of the leading partner: Bulgarian Academy of Sciences - Bulgarian Academy of Sciences: Prof.D.Sc. Rossitsa Chobanova from the Economic Research Institute at the Bulgarian Academy of Sciences – Head, Assist. Prof. Daniela Georgieva – Assistant, M.A. Rositsa Deyanova administrative support, and that of the project partner: Macedonian Academy of Sciences and Arts – MANU, in the composition: Academician Ljupco Kocarev – Head, M.A. Victor Stoykovski – Assistant and M.A. Anna Sokolovska - administrative support. The mutual trust built up in previous joint projects with academician Ljupco Kocarev - a scientist with a broad culture and invaluable human qualities – is of great importance for implementing this interdisciplinary project. I am also thankful to the subcontractors of the project, among which are the Institute for Information and Communication Technologies at the Bulgarian Academy of Sciences, the companies that carried out the monitoring - Global metix and especially to its manager – M.A. Radostina Angelova, the company Reboat from Skopje, the other companies that cooperated during the implementation of the project, the experts Assoc. Prof. Dr. Radostina Popova of the University of Forestry in Sofia and Prof. Dr. Zdravko Trayanov from the Faculty of Forestry in Skopje University, M.A.Diana Dimitrova - translator and text designer, as well as Mrs. Sylvia Stefanova for invaluable administrative support. I would like to express my special thanks to my Assistant in the project, Assist. Prof. Dr. Daniela Georgieva, for her motivation and dedication in implementing this project.

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CHAPTER ONE. TRENDS IN FORESTRY SECTOR – GLOBAL AND REGIONAL CHALLENGES

The forestry based industry has traditionally been a resource and labour-intensive industry characterized by the co-existence of both local craft-based firms and large volume producers. Following the crisis, the global forestry based market is now backing to a growth path. Market opportunities are developing in different areas of the world, with emerging markets, where disposable income is increasing fast, playing an important role alongside the large traditional markets. As it is outlined in the 2008 Commission Communication on innovative and sustainable forest-based industries in the EU these industries are competitive at the global level, but are currently facing several challenges. These include – among others – growing global competition, the availability of energy and wood supplies, and the role of the sector in limiting climate change.

1. Global Trends and Challenges in Forestry Sector Development

Based on the analysis of data from official resources of the European Commission the paper summarizes the challenges Bulgarian and Macedonian policy has to respond to in respective industries of forestry sector.

Furniture manufacture decline

The furniture industry in total has lost importance within the EU economy in the last decade. The number of active companies fell from 135,000 in 2003 to 126,000 in 2011 and the number of employees from around 1,200,000 in 2003 to 920,027 in 2011. The share of furniture production over the total manufacturing sector is in the range of 1.4%, decreasing over the last decade.

In addition, EU furniture production saw a sharp contraction during the crisis, with some recovery in 2010 and 2011 and a slight reversal of trend again in 2012. As a result, the value of furniture production is almost the same as it was ten years ago. However, within the EU, some countries are growing rapidly in terms of production value and others are lagging behind because of structural factors or as the result of the recent economic slump.

Access to sustainably-sourced raw materials, the cost and complications of harvesting wood in the EU, price increases driven by competing demand (e.g., from

the bio-energy sector), comparatively higher energy costs in the EU and a more complex and demanding policy environment affect all segments of the value chain, including the furniture sector.

The increasing competition that global furniture producers are facing has drawn the attention of policy-makers to the possible absence of a level-playing field at the global level, to the detriment of EU producers. While these considerations apply to several sectors, they are even more pertinent for those that are highly dependent on a global and fragmented value chain.

Forestry sector restructuring

Firms designing, manufacturing and shipping products in large quantities (particularly, but not only, in the low and middle-price ranges) are leading players and took advantage of their large scale and the availability of huge capital resources to invest in organizing their production and logistics in order to penetrate foreign markets.

On the other hand, larger firms find it convenient and profitable to outsource and fragment their activities into many functions carried out by different actors in different locations, and small and medium-sized enterprises are increasingly relying on them for their access to markets.

The importance of SMEs is relatively high in niche market segments, primarily for high- end, custom made and design-led products. Overcoming difficulties related to small company size was one of the factors underlying the development of cluster experiences in the furniture sector.

The EU furniture sector is predominantly made of SMEs, with around 85% being micro enterprises (fewer than 10 employees) and another 12% of companies being small (10 to 49). Medium-sized companies account for 2%.

The Bulgarian furniture manufacturing is still performing better than other traditional manufacturing areas. \On other hand, it has constantly contracted over the last decade. The value of furniture production in 2012 was almost at the same level as ten years before. Furniture production in Bulgaria in 2012 is 266 €million, 0% of EU total with 2.6 percentage of average growth rate (2003-2012). In 2011, about 21,000 workers were employed in approximately 2,200 firms belonging to the manufacture of furniture in Bulgaria. For the last decade the number of employed is still decreasing after 2007, when they are 27,352, while the number of enterprises is increasing and becoming 2,407 in 2009 and then they are decreasing. In 2011, the sector's production amounted to more than €240 million with a value added of nearly €100 million, while in 2003 the respective indicators amount respectively – 212 and 45. A tendency of further fragmentation has been occurred in the case of Bulgaria during

the last 10 years when the number of enterprises is almost doubled, while the workers in the sector are increased about 10%.

The semi-finished wooden products represent the upstream segment of the value chain. In 2010, this forest-based manufacturing industry in EU included 184,000 enterprises and employed 1.05 million people, i.e. 0.8% of total non-financial employment.

Low level of consumption

Total world furniture consumption grew from €226 billion in 2003 to a peak of €281 billion in 2007, before decreasing as a consequence of the recession. Growth resumed in 2010.

The Bulgarian furniture market is slowly recovering and constantly opening up. Consumption per capita is the lowest in EU28. In total in 2012 the consumption in Bulgaria (154 €million) was still below the pre-crisis level (284€million), while the production has reached it (268 €million). Furniture consumption in 2012 is 54% of its volume in 2008 and respective furniture imports -59%. For EU28 countries those share are 84% and 93%. Consumption reached €347 billion in 2012, well above pre-recession levels.

In Bulgaria there is no clear tendency of increasing consumption after the crisis. The level of €286 in 2008 is not reached (€154 in 2012). In other words Bulgaria recovers slower than EU28.

The advent of the Internet and e-commerce has also added another dimension of understanding the consumption. According to Eurostat data, more than four out of ten EU consumers (44%) have purchased goods and services over the Internet in the past year. Since 2004 the proportion of Internet shoppers has risen to 44% from 20%. Online shopping remains largely domestic, i.e. consumers are more likely to purchase online from national sellers/providers (41%) than from sellers located in other EU countries (11%). However, e-commerce is the most common form of distance shopping and has been growing steadily since it was first measured in 2004. The results at country level reveal that consumers are most likely to buy online in Sweden (74%), the UK (73%) and Denmark. The lowest levels of online shopping are recorded in Romania (5%) and Bulgaria (9%). The Bulgaria's comparative advantage relates to the low cost of labour. A long tradition in furniture making is another factor, but even if craftsmanship still plays a role in the productive system, furniture production has become an assembly industry and adequate and performing production systems are more important.

Key factors affecting competitiveness

Among the key factors affecting competitiveness in the forestry based industries are the upstream section of the value chain and the role of raw materials and components, labour costs and the availability of skilled labour, of investment in technology, R&D, innovation and design, relevant policies affecting the industry.

Upstream section of the value chain

The main factors affecting the upstream portion of the value chain include the availability of raw materials and skilled labour and investment in tangible goods such as machinery and equipment. Intangible investments in innovation and design also play a decisive role. The combination of these factors for the production of items at competitive prices is another key element.

The weight of raw materials and other production inputs on the total production value can be approximated by the share of the production value taken up by total purchases of goods and services. According to Eurostat Structural Business Statistics, the total purchases of goods and services include the value of all goods and services purchased during the accounting period for resale or consumption in the production process (excluding capital goods). In 2011, purchases of goods and services accounted for 73% of the total production value in the EU28 furniture industry. In particular, the share was higher in EU13 (81%) than in EU15 (72%). Nonetheless, over the period 2008- 2011, in absolute value, the average purchases of goods and services per enterprise were steadily higher in EU15. For instance, in 2011 for each €100 spent by an average EU furniture manufacturer, a company based in EU15 spent more than €120 against €52 spent by companies based in EU13. It could be concluded the availability of raw materials and skilled labour and investment in tangible goods such as machinery and equipment in effective combination with intangibles are precondition for sustainable and competitive furniture industry.

Cost structure

Improving the country cost structure of furniture production is another factor affecting competitive and sustainable development of the furniture industry. In 2011 in Bulgaria purchases of goods and services including energy products are 82.1% over total production value while in EU28 they are 73.3%. A purchase of energy products is 2.5%, while in EU is 1.4%. Personnel costs are 11.4% over the total production value while in EU 28 are 23.8%. Wages in Bulgaria are 11.3%, while in EU 28 are 18.7%. Social security in the country is very low. It is the lowest in EU. Wages are lowest in

the EU. The above has shown Bulgaria needs urgently to improve cost structure of its furniture production.

Gross operating rate

The gross operating rate relates the gross operating surplus (value added less personnel costs) to the level of turnover, thus showing the surplus generated by operating activities after labour costs are paid. The EU13 countries displayed higher gross operating rates compared to the EU15 Members States, partially reflecting lower labour costs in EU13. Furthermore in 2011, the EU13 gross operating rate grew by 11% with respect to 2008, whereas in EU15 the indicator declined by about 12%. Obviously, it is worth stressing that performance indicators for the entire EU productive system vary substantially across countries and average figures are thus the result of mixed performances across the Union. As regards the gross operating rate, in 2011 the highest levels were recorded in UK (13.8% and 13.3%), Poland (11.3%), Slovakia (10.4%) and Austria (10%). By analysing the trend over the 2008-2011, period the best performers in terms of growth rate in the EU13 were Estonia, Slovakia, Latvia and Hungary. Conversely, almost all EU15 countries recorded declining gross operating rates over the 2008-2011 period, with the exception of Austria, Denmark and Germany. In the Bulgaria is declining from 13.8 in 2008 to 10.5 in 2011.

Availability of raw materials and components

The furniture industry is known to be essentially an assembly industry employing various raw materials such as wood-based panels, metal, aluminium, plastics, fabrics, leather and glass, as well as mechanical and ICT components. All the furniture sub-segments, with the exception of mattresses use wood or wood panels as an input, which represents a substantial share of raw materials used in production. For this reason, emphasis was put on wood.

In the last three decades, reportedly the share of European furniture manufacturers employing wood-based panels has sharply increased compared to those who use solid wood. Two main reasons have been identified: the declining prices of wood-based panels compared to sawn wood and the relative ease with which panels can be assembled. This trend has been further reinforced by the advent of RTA Wood-based panels are produced from primary processing of raw timber. The three main categories of wood-based panels are particleboard, fibreboard (mainly MDF) and plywood. They are essentially produced under heat and pressure with the addition of an adhesive to glue fibres, particles or sheets. Production requires very large plants

and huge investments in machinery, thus the scale of manufacturers is generally large (compared to the furniture industry) and entry barriers are high.

Taking into account the fragmentation of the sector in Bulgaria it could be suggested a closer cooperation between firms. It means virtual coordination of operations, investment, etc. for better quality and productivity in an effective ecologically sustainable sector.

Labour cost

As mentioned above, the furniture industry is essentially an assembly industry. As such, labour costs constitute a relatively important component of the final retail cost of furniture.

Being a resource- and labour-intensive industry, the entry barriers to the furniture industry are rather low. This allows new producers from emerging and transition economies to easily enter the European market. In order to retain market shares, price competitiveness is a crucial driver of success. For this reason, since the beginning of the 1990s Western European firms have been restructuring their production process, investing in new plants in low-wage countries or outsourcing part of their activities to those areas. The difference in wages and salaries paid in EU15 and in EU13 is clear. On average, the cost per employee in EU13 is 25% lower than in EU15. However, large differences exist among countries. Indeed, in Europe the incidence of personnel costs on the production in the furniture manufacturing sector is on average around 25%, while in Bulgaria is below 15%. This fact could attract foreign investment, but not necessarily affect positively effectiveness of country's cost structure of the sector.

Investment in technology machinery

Adequate machinery endowment is widely recognised as a crucial factor in the production process, as it delivers efficiency and productivity gains. This applies to all the furniture segments, but in particular in the case of assembly-line manufactures orientation, when production is in big series. Standardization of production should go hand in hand with minimization of costs and in this process, technology (both in production and logistic) has a decisive role. Companies' capital investments in plant and machinery have also an impact in reducing waste and increasing safety.

In general, tangible investments in the furniture sector concern the automation of the production process. Indeed, more than half of the total investments are for new machinery and equipment. In order to automate the production process furniture firms usually introduce Computer Assisted Manufacturing (CAM) solutions and Computerised Numerical Control (CNC) machines. Important investments are made

in this area by medium-sized and large enterprises to optimise production, to create synergy between different lines or sites of production and to achieve scale economies. In particular, German and Italian wood furniture manufacturers are at the forefront in terms of woodworking machinery technology and are considered world leaders.

The Bulgaria's gross investments in tangible goods by type in furniture production, 2010 (€million and percentage values on EU28) is not well balanced. The land consists 0.5, existing buildings and structures -1.1 construction and alteration of buildings – 11.3, machinery and equipment – 12.3. These tangible goods are 25.2. The share of investment in machinery and equipment over the total investment in tangible goods is 49% very low comparatively to the EU 28 is 71 % (excl. Greece, France, Ireland and Malta). Source: Eurostat (sbs_na_ind_r2).

R&D, innovation and design

The competitiveness of Bulgaria's manufacturers should be assessed in terms of their ability to meet consumer demand, both present and potential, through innovation and design.

R&D and innovation are crucial factors to maintain market positions. This is made necessary by consumers' changing needs and market pressure. Changing tastes, emerging needs and the introduction of innovative products are key issues. The present trend has to do with customization, ergonomics, and functionality. Eco-issues are also becoming increasingly important.

The need for design is another focus for the innovation policy. Together with new consumer needs and products trends, the globalisation of the furniture industry and the difficulties experienced by Bulgarian firms in competing with the prices of Asian imports have moved the design function to the forefront.

Bulgarian manufacturers now regard design as the best means of differentiating their products from mass production and of acquiring access to the high-income market segments. Design is indeed widely recognised as offering furniture producers a competitive advantage that can counterbalance the price advantage of low-wage countries. Industrial design is generally interpreted as the sum of the aesthetic-project content of a furnishing product: from function to form, from material to colour and finishing, all are seen as the realisation of technical design. Designs and new models in the furniture industry are created in-house, or by external designers and experts. External consultants are more frequently employed by medium-sized and high-brand enterprises. Moreover, they are generally hired by companies specialising in modern and contemporary styles rather than by companies making classic and traditional style products, or companies without a particular specialisation. In general terms, the

contribution of designers is most important during the first phases of the generation of a new product.

Besides design, innovation in materials and technologies is another crucial competitiveness driver. Contrary to design, only a small number of Bulgarian firms carry out industrial research activities internally in order to develop new materials or technology for furniture. However, an important asset of the Bulgarian furniture industry is that it can work closely with suppliers of new materials and new technologies. In particular, innovation in materials is often carried out by firms specializing in surface finishing, while technological innovation is often achieved by component producers.

An interesting field of innovation which can potentially affect the furniture sector in the near future is represented by nanomaterials and nanotechnology. Recently, a joint project by the European Federation of Building and Woodworkers (EFBWW), the European Furniture Manufacturers Federation (UEA) and the European Furniture Industries Federation (EFIC) has mapped current uses and near future perspective on nanomaterials in the European furniture sector. It is worth mentioning that research and development on nanomaterials and nanoproducts is not carried out by the furniture sector which typically exploits the findings of the research and development activities of other industries. Looking at the market of 2012, the aforementioned project found out that the use of manufactured nanomaterials in furniture products is still at an early stage of development since their costs are quite high while the confidence of furniture manufacturers and consumers is still low. The majority of nanomaterials applications can be found in the field of coatings, e.g., scratch resistant coatings, anti-graffiti coatings, easy-to-clean and water repellent coatings, UV-protective coatings, and self-cleaning coatings.

At this stage the share of R&D personnel out of the total number of employees in the furniture manufacturing sector in Bulgaria is neglectable, which is a barrier to meet the new challenges.

Process innovation is another important competitive edge for furniture manufacturers. According to the CSIL Report (2013), top European manufacturers invest in upgrading and automating their production processes through new engineering solutions. They also introduce new production methods that allow for energy savings. For instance, the furniture production line can be equipped with an environmentally-friendly woodchip burner that recycles all the waste wood and chippings and uses it as fuel in the production facilities. The energy is used directly and without any additional transport costs.

Conclusions

The forest-based industries are currently facing several challenges. Among them are growing global competition, the availability of energy and wood supplies, and the role of the sector in limiting climate change. The 2013 Communication “A New EU Forest Strategy” and the accompanying “Blueprint for the EU Forest-Based Industries” (F-BI) confirm the persistence of these challenges and their impact on the overall competitiveness of EU F-BI in a global context. All segments of the value chain, including the furniture sector are affected by the access to sustainably-sourced raw materials, the cost and complications of harvesting wood in the EU, price increases driven by competing demand (e.g., from the bio-energy sector), comparatively higher energy costs in the EU and a more complex and demanding policy environment. Some of these challenges have also an impact on consumption patterns. Against this background, the degree of information available to the final customers becomes of relevance.

The policy problem at hand appears mostly related to a specific type of market failure, i.e. incomplete information, which triggers a problem of adverse selection due to the following features of the furniture industry: Most of the quality features of furniture products belong to the categories of experience and credence attributes: this means that consumers might not always be entirely equipped to fully incorporate quality features in purchasing decisions, as well as to distinguish between high- and low-quality products. This can generate problems of adverse selection, in which consumers do not fully adjust their willingness to pay to the difference in quality of products available on the market.

The adverse selection problem is further exacerbated by the fact that retailers that sell both high- and low-quality furniture might not have the same incentives as manufacturers in making quality differences crystal clear for customers. The problem is also aggravated by emerging trends such as increased competition from non-EU countries, growing price-sensitivity of furniture demand generated by reduced disposable income, and the rise of online furniture stores, which make the quality features of furniture even more difficult to test in practice before purchase. It must also be recalled that online interaction between consumers might, in principle, fill some of the information gaps on experience qualities (e.g. through rating of specific pieces of furniture by other consumers), but not on credence qualities, and not for all furniture products existing on the market.

In addition, other problems have been highlighted: Existing product guarantees only partially address the issue as, in the case of furniture, quality problems can become visible after a guarantee has expired and when complaints cannot be enforced. Several factors including the globalization of value chains, new sourcing strategies, and in particular the growing diffusion of new retail formats have altered vertical

relations between manufacturers and retailers and made competition on “quality signalling” fiercer. In addition, due to the structure of furniture production in the EU, manufacturers are more likely to be the side with less bargaining power in the vertical relationship, which also affects the type of product information that is ultimately communicated at the point of sale. As a result, consumers receive confusing messages, as different actors at different levels of the value chain may be interested in providing different types of product information to the consumer.

The lack of homogeneous market conditions seems to be hampering smaller businesses and the Single Market. Mandatory schemes with non-fully overlapping scopes and modes of implementation adopted by different Member States to signal the general quality or specific features of furniture products do not appear to have generated significant barriers to intra-EU trade at the macro-level. However in a public consultation, they hinder or make cross-border activities more burdensome for smaller businesses. Some of the mandatory initiatives that are already in the pipeline in some EU countries could further.

2. Forestry Sector in Bulgaria

The wooded territories in Bulgaria cover 4 148 114 ha or 37.4% of the territory of the country. Of them 3 774 778 ha or 91% are forests. Most of the wooded territories are state owned – 74.5% of their total area. The non-state owned wooded territories are 23.5%, including owned by municipalities (12%), by physical and juridical persons (11%), by religious organizations (0.5%), and forests created on former agricultural lands (2%). The illegal logging and poaching are one of the most important problems concerning the protection of the Bulgarian forests. In the period 2005-2010 the average annual growth increases from 14.1 million m² to 14.4 million m² timber. The use of non-tree wooded resources as an economic activity, source of incomes, is insufficient. To a significant extent, especially from the wooded territories owned by the state, the potential remains not used. This is due to the lack of inventory and real evaluation of these resources and the opportunities they provide for diversification of the incomes in the forestry sector (National strategy for development of the forestry sector in Bulgaria, 2013).

The state of the logging firms, where the production process is realized under extremely unfavourable conditions – low productivity, old equipment for production and transport of the timber, low level of education and qualification of the workers, is alarming.

The forestry road map of the country is considerably poorly developed. By last available data from expert evaluation of The World Bank in 2003, there are 28 000

km of roads in the wooded territories. Of them, about 10 000 km are with crushed stone or asphalt covering, and about 18 000 km have no covering. Almost 18 000 km are owned by National Forestry Enterprise and National Gamegrowing Enterprises. About 10 000 km have republican and other ownership (National strategy for development of the forestry sector in Bulgaria, 2013).

The average density of the forestry road map is 7.9 m/ha. It is comparable to the one in Romania (6.5 m/ha) but it is significantly lower than the one in other European countries like Austria (36 m/ha), France (26 m/ha), Germany (45 m/ha) and Switzerland (40 m/ha).

In the last 10 years, mainly due to financial limitations, almost no new roads have been built, and the maintenance and reconstruction of the existing ones are insufficient. Of the entire forestry road map, 75% are not suitable for movement of timber with modern means of transportation. As a result of the amortization of the forestry road network, the share of not used forest roads, or those hardly accessible with the equipment during certain periods of time, increases. This prolongs the activities and increases costs in the chain of supplies of timber and reduces the competitiveness of the forestry sector. Insufficiently developed forest infrastructure and unsatisfactory state of part of the forest roads create a premise for excessive use of timber in certain wooded territories. In addition, the traditionally applied practices for building forest roads fall behind compared with the ones used in other European countries, which goal is softening the potential ecological violations as a result of designing and building forest roads (National strategy for development of the forestry sector in Bulgaria, 2013).

Main problems of the Forestry in Bulgaria are (National strategy for development of the forestry sector in Bulgaria, 2013):

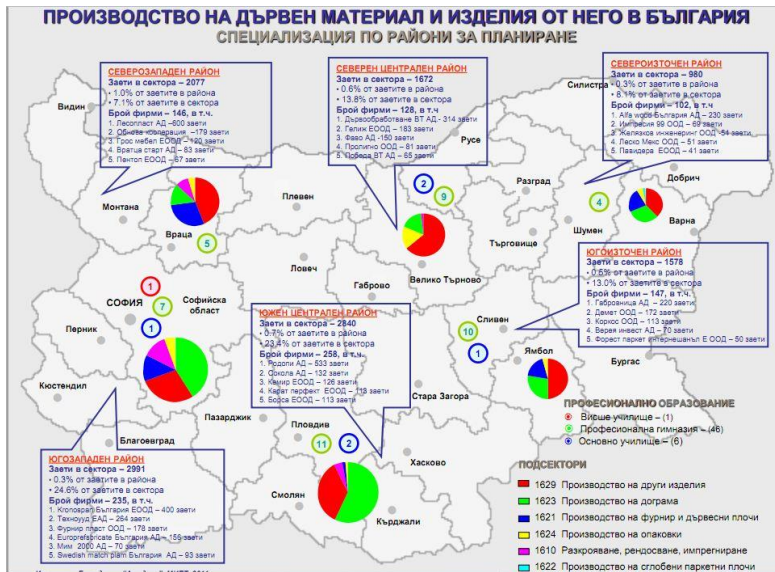
- Low labour productivity;
- Difficult access to financing;
- Lack of opportunities for using finances from the EU structural funds for investment in renovation of equipment in logging, machines, production lines and transport of wood production;
- Insufficient involvement (support) of the banks in the investment projects;
- Low share of certified forest territories and certified forest entrepreneurs.

In Bulgaria there are about 3000 registered juridical persons with object of activity including logging activities, of which about 400 have permanent such activity. Most of the workers in these firms have concluded a civil contract. Small wood-processing enterprises usually have own teams for logging. The state of the logging firms is alarming. Main reasons are the extremely unfavourable conditions, under which the

production process is realized – low productivity, old equipment for logging and transporting of the timber, low level of education and qualification of the workers (National strategy for development of the forestry sector in Bulgaria, 2013).

The wood-processing and furniture industry in Bulgaria (Forestry industry) includes two sub-sectors – Wood-processing and Furniture manufacturing. According to data of Bulgarian Branch Chamber of Woodworking and Furniture Industry, in the period 2008-2015 the number of enterprises in the two sub-sectors from 4226 reach 4074, the biggest number is in 2008. The employed people in this industry are 47 663 in 2008 and 36 682 in 2015 (Bulgarian Branch Chamber of Woodworking and Furniture Industry (BBCWFI), National Statistical Institute, 2015).

Figure 1.1. Manufacturing wood and wood items in Bulgaria. Specialisation by planning regions

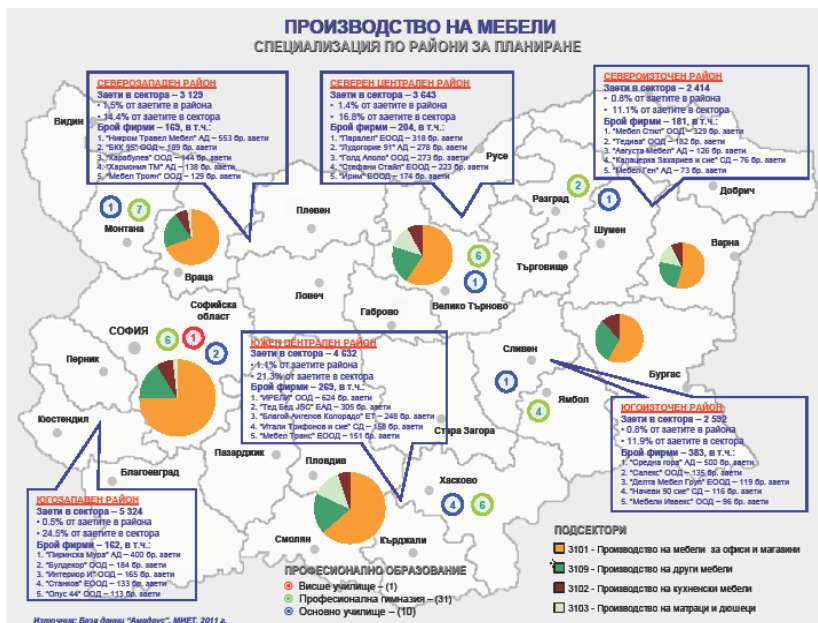


Source: Ministry of economy, energetics and tourism, 2011.

Leading trade partners of Bulgaria are:

- Export of furniture – Germany, Czech Republic, Great Britain, France.
- Export of timber and its products, except furniture – Greece, Turkey, Italy, France, Macedonia.

Figure 1.2. Manufacturing furniture. Specialisation by planning regions



Source: Ministry of economy, energetics and tourism, 2011.

As a whole, the firms from the Forestry industry have overcome the crisis and there is an increase of the production. The branch can be evaluated as perspective, having in mind the presence of sufficient raw material resource, sustainable internal and external market positions of the manufactured products and their significance as a source of incomes and employment for large part of the population in the mountain and rural areas.

The territorial distribution of the enterprises from wood-processing and furniture industry refers to the mountain areas of the country, where are focused the main sources of raw timber concerning forest area, timber reserves, annual use.

The main wood-processing enterprises are located in the regions of the Balkan Mountains, Rhodope and Rila-Pirin. In these areas, where most of the resources of raw timber are located, are established the enterprises for its primary processing (in Troyan, Cherni Osam, Teteven, Tvarditsa, Kotel, Sliven, Berkovitsa, Batoshevo, Glojene, Ticha, Dupnitsa, Velingrad, Rakitovo, Peshtera, Batak, Yakoruda, Samokov, Blagoevgrad, Belovo, Devin, Chepelare, Asenovgrad). The low transportability of the raw timber and the high transport costs are the reasons the enterprises of primary

timber processing to be established exactly in these regions, sources of raw timber. The influence of these factors is also a reason for their low mobility.

The enterprises for manufacturing the end timber-based product – furniture, joinery, wood assembled constructions and houses, are positioned mostly in the large consumer centres (in Sofia, Plovdiv, Stara Zagora, Yambol, Varna, Burgas, Ruse, Vidin, Targovishte, Pleven, Veliko Tarnovo, Shumen, etc.).

Production of raw timber and timber-based products is directly related to the furniture manufacturing – the products of the wood-processing enterprises are necessary for the furniture manufacturers for the production of the end product in the wood-processing and furniture industry – furniture. Furniture manufacturing includes many stages and different relations between suppliers of raw materials and materials (Forestry), technology level in the sector, various types of machines, equipment, etc., on which depends the end product – furniture.

Furniture industry is a sub-sector of the wood-processing and furniture industry. It produces about 2.6% of the total GDP of the country, a little less than 10% of the industrial GDP and over 20% of the GDP in the processing industry. According to statistical data, over 97% of the firms in the furniture sector in Bulgaria are SMEs.

SMEs predominate. The manufactured products, depending on the object of activity, include hotel furniture, office furniture, kitchen furniture, framed furniture, upholstered furniture, tables and chairs, tubular furniture (Bulgarian Branch Chamber of Woodworking and Furniture Industry, National Statistical Institute, 2012). Turkey and Greece are among the leading partners of Bulgaria.

As a whole, Bulgarian furniture manufacturing still performs better than other traditional manufacturing sectors. On the other hand, it constantly shrinks in the last decade and the value of furniture manufacturing in 2012 is almost the same as about 10 years ago. Furniture manufacturing in Bulgaria in 2012 is valued 266 million EUR, which is 0% of the total EU with 2.6% of the average growth rate (2003-2012). In 2011 about 21 000 workers have been hired in about 2200 firms, associated with the furniture manufacturing in Bulgaria. In the last decade the number of employed people still decreases after 2007, when they are 27 352, and the number of enterprises has increased to 2407 in 2009, and then have decreased. In 2011 the production in the sector is 249 million EUR with added value of almost 100 million EUR. On the other hand, in 2003 the respected indicators are 212 and 45. The tendency of further fragmentation have occurred in Bulgaria in the last 10 years, when the number of enterprises is almost twice more, while the workers in the sector have increased by almost 10% (Bulgarian Branch Chamber of Woodworking and Furniture Industry, National Statistical Institute, 2015).

Use of modern materials

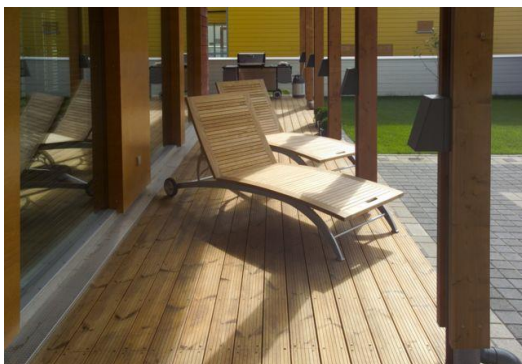
Raw materials and main materials are in the basis of creating the material content of the ready product. Used in the sector raw materials and main materials are round wood, technological splinters, boards, beams, details, LDF, MDF, plywood, veneer – natural and artificial, paints, glues, varnishes, etc. In the last three decades the share of the European furniture manufacturers using fibreboards has increased sharply compared with the ones using solid wood. The reasons are the lower prices of the fibreboards compared to solid wood and the relative easiness of their assembling.

The light panels with porous core minimize the content of material and save transport costs, and the high-protected coverings eliminate the harmful pollutions. Solid wood becomes more and more popular, instead of veneer and laminates.

Light boards with melamine covering



Heat treated wood allowing application at any meteorological conditions



New materials are often used in combination and supplement the traditional wood furniture. They are various – main and supportive, wood and non-wood, with different features and sizes. The fibreboard materials – LDF, MDF, new types of light boards (noise-absorbing, from wood foam, etc.), bendable plywood, heat wood, liquid wood, new types of laminate, are among the modern innovative materials in the furniture manufacturing.

Covering with CPL (Continuous Pressure Laminate) is strong and practical, but its surface is industrially strengthened so it reacts better to possible scratches. Even stronger and harder is the covering with HPL (High Pressure Laminate) – suitable for industrial objects. CPL/HPL remains without a change for years, just as it has been at the time of purchase.

CPL/HPL



Classification of the materials used in the wood-processing and furniture industry include:

- Wood and faced materials – timber (impregnated), boards, beams, etc.;
- Details and semi-manufactured wood materials – wooden panelling, wooden floor, etc.;
- Materials of mineral origin – technical stone, mineral boards, etc.;
- Board materials – LDF, MDF, gloss boards;
- Facing materials – bendable plywood, stone veneers, laminates, edges;

- Materials for protection of the wood – varnishes (varnish delaying burning), ground coats of paint, chemicals, supplements;
- Materials for upholstering of furniture – leather, textile, fabrics, under-mattress frames;
- Furniture facing, facing for doors and windows;
- Locks and locking systems;
- Glues.

Depending on the used raw materials and materials, the furniture is from: wood, sugar-cane, osier, bamboo or similar materials, metal, plastic, stone, glass, combination of materials. Bamboo is material actively used in the modern style of furniture and in furniture with eco design. It is successfully combined with polystyrene and aluminium, which can be recycled. At the same time, the variety of paints, ground coats of paint and textile contribute most to the attractiveness of the furniture. The non-wood materials from glass, metal, fabric, leather, fabric with metal fibres, 3D fabrics, of mineral origin, and combined materials, develop strongly and become more and more substantial part of the furniture manufacturing. Protective-decorative coverings and all types of materials have more and more ecological orientation, which aims at decreasing the harmful impact and minimizing the wastes.

Furniture manufacturing includes assembling and using different materials like fibreboards, metal, aluminium, plastic, fabric, leather and glass, as well as mechanical and ICT components. All furniture productions, except the production of mattresses, use fibreboards at the entry, which is a significant share of the materials used in the furniture manufacturing. In the last three decades the share of the European furniture manufacturers using fibreboards has increased sharply compared with the ones using solid wood. The reasons are the lower prices of the fibreboards compared to solid wood and the relative easiness of their assembling. This tendency increases even more with the use of RTA fibreboards, made at the primary processing of raw timber. The three main types of fibreboards are boards from wood fragments, boards from fibreboards (mostly MDF) and plywood. The production requires large investments in machines and installations, which is large scale (compared with the furniture production), as well as high barriers to entering the market.

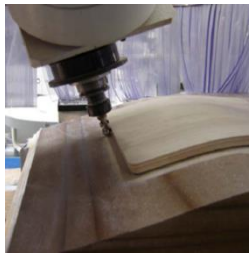
- Use of machines and equipment in accordance with the type of production process

Machines and equipment are important part of every enterprise – the effective processing, preservation and storage of materials are equally significant for the effectiveness of the production process.

Computer controlled drills for drilling holes



Machines with 5 axes



There is a big choice of machines depending on the specifics and type of the production process. Enterprises today need machines, which efficiently manufacture certain discrete part, and then automatically change the configuration for another part for seconds.





More and more European firms use labels of the materials containing coded information, which directs the processing of the next machines. The barcode contains information on the exact material and informs the operator, and the reverse conveyor allows labelling by one person.



Furniture sector in EU (EU-28) registers 2698 million EUR material investments in 2010. To a greatest extent the material investments are for automatization of the production process. Actually, more than half of all investments are in new machines and equipment. These are mostly CAD/CAM systems. German and Italian furniture manufacturers are the leaders in investments in machines and technology. The

structure of the material investments in Bulgaria in furniture manufacturing in 2010 includes: existing buildings and constructions – 1.1%, building reconstruction – 11.3%, machines and equipment – 12.3%. The share of the material investments in the total investments is 25.2%. The share of investments in machines and equipment in the total investments in material assets is 49%, much lower than in EU-28 (71%), except Greece, France, Ireland and Malta.



- Use of ICT

The information systems, which are important for the production in wood-processing and furniture industry, include mainly: purchase system, which ensures the exact quantity of the exact materials; product system, which allows efficient product engineering; measurement system, providing the managers and workers the critical measures, which show how the enterprise and its separate elements on the set goals work (balanced point map).

The innovation applications in this area require changes in the organization and work processes. The e-business applications are used in support of decision making and encouraging and improving the skills concerning the organization of the work processes and procedures and the application of innovation technologies.

The quality concerning ICT infrastructure is good. European furniture enterprises are quite active in using internet – 64% of them use internet or other computer systems. The share increases to 76% in the large firms but it is also high in SMEs (50%). Leading furniture enterprises in using internet are France (81%), Poland (75%), UK and Germany (66%) (European Commission, 2009).

Designing new products is a complicated process, which goal is creating comfort, aesthetics and at the same time stability. Manufacturers face many challenges in designing and modelling new products – they face difficulties in the exchange of information with shops and business partners on the chain of delivery and sales. The questions concerning the stability and green design turn into a very important part of the production process. Design is a key element with increasing significance for the manufacturers and adding value to the consumers. At the same time, there should be a responsible use of the resources and materials and this imposes a combination of the requirements and the creative interpreting of the modern aesthetic concepts and production methods. The common European tendency is towards increase of the use of raw materials from renewable sources, as well as the opportunity for recycling.

The use of integrated ICT, supported by modules for furniture design as well, is a competitive advantage in the sector, where most designers orient to aesthetic innovations and not so much to technological innovations. In this sense, the use of ICT in production and delivery, as well as in sales, is a key factor for increasing the competitiveness of the furniture enterprises.

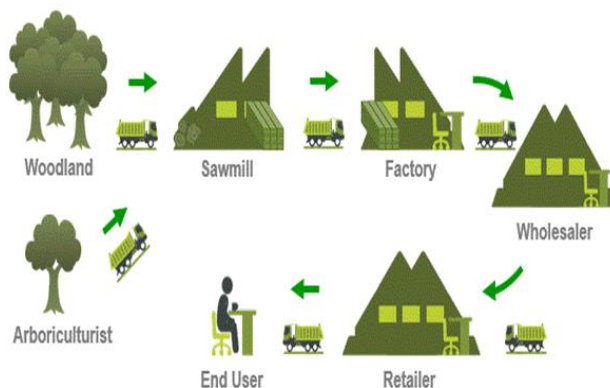
Computer-Aided Design (CAD) and Computer-Aided Manufacture (CAM) are the two most often used computer-based instruments. CAD/CAM are systems using computer-based data for designing parts, details and systems, executing complex structural and design analyses, direct programming of the execution of details. There is software for qualified specialists, which allows sizing, positioning and making 3D decorations and textures on the projects, for manufacturing attractive furniture.

Computer Aided Manufacturing (CAM) systems support the automatization of the production unit and include instruments for control and robotics in real time. Most CAD systems use CAD plans for producing a machine code, necessary for the production of physical components, drawn in illustrations. Such systems are called CAD/CAM and are very popular in the furniture industry. When they are integrated with CAE, they become CAD/CAM/CAE systems. CAE are computer systems, which analyze engineer projects. The innovativeness in using CAE software is in easing the communication and opportunity for the professionals to maintain two points of view simultaneously. CAD/CAM leads to the creation of CNC, parametric designing, 3D modelling. Computer-aided industrial design (CAID) is a sub-division of CAD, which includes software directly supporting the development of the project.

The development of software applications in designing and engineering has led to the creation of complex systems, including instruments for eco design – a system integration of ecological aspects in the design of the product for improving its ecological indicators through the entire life cycle.

- Supply chain management

The classical scheme of the chain of delivery in the Forestry industry includes: logging – wood-processing – furniture manufacturing – wholesaler – retailer – consumers.



The consumer demand continuously changes and the competitiveness with cheap goods increases. Outlining the brand and maintaining the market share depend more than ever on the needs of the client and provision of the desired products and services. The effectiveness of the storage processes and logistics place increased requirements to the information systems for ensuring functionality and flexibility necessary for satisfying the requirements of the consumers. This leads to exigencies of the clients concerning the delivery terms. The chain of delivery is complex and includes several separate activities, which in many EU countries are organized in integrated production networks. About 21% of the European furniture SMEs, however, use ERP. The large enterprises use such systems significantly more (71%). SCM is a concept, which if applied correctly, leads to speed, quality, flexibility and price. However, only 20% of the European SMEs in wood-processing and furniture industry have implemented SCM in their activity (European Commission, 2009).

- Electronic business and commerce

Distribution and sale channels are mostly independent from the production, although in the last years the share of direct sales through own network has increased. Usually the distribution is done at national level, except for some design firms and furniture manufacturers of high class and custom orders – and IKEA of course. European distribution channels for furniture include independent retailers, wholesalers, non-specialized shops, e-mail orders, DIY (“Do It Yourself”), etc.

In marketing and sales the software products developed for the furniture industry allow the retailer to manage and control geographically dispersed objects from a central station. Product range and price strategy can be created and maintained in the country and the region from the central office. Investments of the furniture manufacturers in EU are made mostly in planning the production, managing storage availabilities and decrease of reserves, and not in their integration with the distribution network.

Together with the integration of the mentioned above instruments for management in the enterprise, the firms need software instruments at the point of sale. Manufacturers use automated instruments for configuring products and prices and visualization of the products with a dynamic graph. The virtual reality is a computer simulation, which uses 3D graph and devices for ensuring interactive consumer view and this suggests visual solutions and their correspondence to other objects and accessories.

Some of the main difficulties and challenges to the European manufacturers from wood-processing and furniture industry in using electronic commerce are: insensitivity to innovations, both internal and external for the enterprise; high costs for ICT solutions; lack of technically qualified human resources, etc. The role of internet and electronic commerce increases in the consumption of furniture. According to Eurostat data, more than four of every ten consumers in EU (44%) have purchased goods and services on internet. In the last years the share of internet buyers has increased from 20% to 44%. Online purchases remain to a great extent internal, i.e. the consumers are more inclined to purchase online from national traders/suppliers (41%) than from sellers in other EU countries (11%). Consumers are more inclined to purchase online from Sweden (74%), Great Britain (73%) and Denmark. Lowest levels of online purchasing are for Romania (5%) and Bulgaria (9%) (Eurostat, 2015).

- R&D, innovations and design

R&D and innovations are key factors for maintaining market positions. This is due to the changing requirements of the consumers and the competition pressure. Changing tastes, emerging needs and introducing innovative products are key factors for creating innovations. The tendency concerns personalization, ergonomics and functionality. Eco issues also become more and more significant to the consumers.

Design is another important focus in the area of innovations. With the new consumer requirements, globalization of the furniture industry and the difficulties of the Bulgarian firms competing with the prices of the Asian manufacturers, design becomes more significant. Bulgarian manufacturers today consider design the best mean for differentiating their products from the mass production and for entering new market segments. Design is a competitive advantage, which is particularly significant for countries with low salaries. Industrial design concerns material, colour and covering. Designing new models in the furniture industry is done by designers of the firm or

external designers and experts. The internal consultants are more often used by medium-sized and large enterprises. Also, they are usually hired by firms specialized in modern and contemporary styles, and not by firms manufacturing products in classical and traditional style, or firms without concrete specialization. The contribution of the designers is most important during the first stages of the production of new product (Chobanova, 2015).

Besides the design, innovations in materials and technologies are another main engine of competitiveness. Few Bulgarian firms have innovation activities to develop new materials or technologies for furniture. More particularly, innovations in materials are often made by firms specializing in processing surfaces, while technological innovations are often made by component manufacturers. An interesting type of innovations, which can relate to the furniture sector in the near future, concerns nano-materials and nano-technologies.

In a joint project of the European Federation of Building and Woodworkers (EFBWW), the European Furniture Manufacturers Federation (UEA) and the European Furniture Industries Confederation (EFIC) state the perspectives of the nano-materials in the European furniture sector. The use of nano-materials in furniture products is still at an early stage of development, since their costs are quite high. Most of the applications of the nano-materials can be found in the areas of coverings, for example scratch-safe coverings, easy for cleaning and water-safe coverings, UV-protective coverings, and self-cleaning coverings. At this stage, the share of R&D personnel in the total number of employed in the furniture manufacturing sector in Bulgaria is extremely low – this can be an obstacle for responding to the new challenges (Chobanova, 2015).

Process innovations are another important competitive advantage for furniture manufacturers. According to the CSIL report (2013), the best European manufacturers invest in modernization and automatization of the production processes through new engineering solutions. They also introduce new production methods, which gives opportunity for energy saving. Typical example is when the furniture production is equipped with systems for recycling the wood wastes as well, which are used as a fuel in the production. The energy is used directly without any additional costs for transport (Eurostat, 2014).

Forestry sector in Blagoevgrad and Kyustendil regions

Blagoevgrad and Kyustendil regions are part of the Southwest planning region (SPR) in Bulgaria. They cover 462 municipalities, 452 973 settlements and population of 452 973 people. In SPR the manufacture of furniture for offices and shops dominates, and the production of spring-beds and mattresses has the smallest share.

Analysis of the state and problems of the regions is made concerning demographic development, unemployment, poverty, GDP, cooperation and ICT, competitiveness and innovations, forestry (Cross-border cooperation programme 2014-2020).

Demographic development of the two regions is specified with low density of population, decrease of birth-rate and aging population. In the period 2007-2012 the population has decreased in Kyustendil (-10.98%) and has extremely decreased in municipalities Trekliano (-43.74%), Nevestino (-26.8%), Rila (-24.17%), Kocherinovo (-21.1%), and several others.

Unemployment is 10.4% in Blagoevgrad. The problems to be solved concern the significantly higher levels of unemployment in the rural areas compared with the city centres (due to the low economic activity, low educated labour force) and high youth unemployment, which is a serious problem at national level and in both countries with strong negative tendency in the Bulgarian regions. Unemployment among youth, particularly those with higher education, is alarming, since it is the main reason for emigration. This worsens the already unfavourable demographic situation in the region. Motivating young and qualified specialists and scientists to stay/move to work in the region is a problem, having in mind the lack of opportunities for career development.

The level of poverty has negative trends. Unlike these poverty ratios, Blagoevgrad district is leading in the country with lowest share of people living under the poverty line (12.4% in 2011 compared with 21.2% in Bulgaria).

GDP per capita in the period 2007-2011 as a whole increases – in Kyustendil district it is 5% but remains under the average for the country. External investments in the region are quite limited, which hinders the effective and sustainable development of the local firms (Bulgarian National Statistical Institute, 2012; Macedonian State Statistics, 2012).

The main areas of industrial activity are manufacturing of store clothes and shoes, food, pharmaceutical and machine-building industries, electronics, production of electrical energy and mining industry. The problems of the branch are related to the loss of competitiveness due to the continuing process of restructuring, loss of traditional markets, lack of modern technologies, low resource effectiveness, lack of management skills and technical personnel and low investments and R&D.

Service sector in the regions increases faster than the tendencies at national level. Tourism, though with stable growth and well-developed in some areas, still has a modest share in GDP.

R&D activities are not among the main strong sides of the regions. As a whole, the ability for innovations and R&D activity remains low at national level compared with EU-27. There are limited opportunities (financial, human, management) and very low

potential for innovations of the existing enterprises to apply new technologies, having in mind the predominantly international character of the applied studies. Many of the existing enterprises have low level of technological development and limited potential for applied studies. They miss know-how and qualified personnel to be able to achieve innovative growth. There are not enough dynamic internal engines for R&D activity, which would increase the potential for innovations in the region.

Regions do not manage to use completely the benefits from the closeness of the capital, where the national potential of R&D activity is focused. They also do not benefit a lot from the transfer of innovative practices and technologies from the foreign investors. Public organizations or non-profit organizations can play an important role in the area of applied studies, innovations and transfer of technologies, but they are not particularly active in this sense.

In the regions there are cluster initiatives, which can be considered an excellent starting point for coordination at institutional level and for establishment of similar cross-border networks of enterprises.

The situation concerning connectivity and use of ICT is considerably good, but there are also some regional inequalities. According to Eurostat data, the share of households using internet in EU-27 in 2012 is 76%, compared with 51% in Bulgaria. Use of ICT in mountain and distant regions is quite limited.

Competitiveness of the regions is formed on the basis of low costs of the main factors – labour force and nature resources, and not of innovations, education and qualification, transfer of technologies, R&D activity. In the last years the economies of Kyustendil and Blagoevgrad regions maintain their high specializations in branches and activities, which require considerably low qualification and technologies. This determines also the nature of the regional export, which consists mainly of products with low added value.

Low productivity and efficiency of the resources of the local SMEs is a problem hindering their ability to manage the competition with the neighbouring countries and EU countries. The difficult access to financial resources is an obstacle for SMEs to successfully develop and compete with their European analogues. There is a need for increasing the access of SMEs to international markets.

Logging is typical of the establishments near forest areas. The forest activity has significant potential for the region on the basis of the existing nature resources, logging is mostly softwood. However, its share is modest and far from the possible incomes. The results can be improved through measures and cooperation for effective and sustainable use of the forests in the regions. The Southwest State Enterprise in Blagoevgrad manages state forest territories in 7 administrative districts – Blagoevgrad, Kyustendil, Sofia city, Sofia district, Pazardjik, Pernik and Lovech. It

consists of 38 territorial enterprises, of which 35 are state forestry enterprises and 5 are state hunting enterprises. The total area of forest territories included in the Southwest State Enterprise is 934 968 ha, of which 686 310 ha are state forest territories (73.4%). It is an extremely rich nature resource, which determines also the large volume of activities in the forests (<http://www.uzdp.bg>).

Concerning wood-processing, dominating is production of joinery, boards and other products. Production of wood-wrapping has the smallest share. Biggest wood-processing firms are: “Technowood” – Razlog, “Furnir Plast” – Blagoevgrad. “Pirinska Mura” – Bansko is one of the largest furniture firms. The raw timber is often purchased from other regions. Materials for furniture manufacturing are mainly different types of boards – LDF, MDF, etc. The Bulgarian furniture firms purchase them from “Kastamonu” – Kazanluk and “Kronospan” – Burgas, the two large wood-processing enterprises in the country, situated also in other geographic regions, like the foreign manufacturers.

Carried out discussion with representatives of the furniture branch in 2016 shows that the main groups of problems in the wood-processing and furniture industry are:

- Insufficient management skills in the sector;
- Insufficient information on the opportunities for the business by the branches;
- Loss of traditional markets;
- Cooperation with scientific institutes, relations with European networks;
- Lack of information on procedures for purchase or registration of patents and other forms of protection of intellectual property;
- Lack of information on standards;
- Difficulties for career development of women working in the sector;
- Unattractiveness of the work and labour conditions in the sector;
- Low payment in the sector.

Among the recommendations of the business to BBCWFI and institutions are the increase of informativeness and decrease of the problems with communications of the firms, particularly the ones in the distant areas of the country.

Among the suggestions of the participants is the creation of a digital platform for the needs of the firms in the sector, which would increase the informativeness on the innovations in the sector, the opportunities for participation in different European associations and networks, programmes and projects of EU, etc.

The increase of competitiveness of the enterprises in Blagoevgrad and Kyustendil regions can happen through decrease of the transport costs and the effective use of the raw material, as well as through cooperation between enterprises and application of a production patent in the regions. In total, the concentration of firms in a certain area can create a network, which functioning depends on the effective management of the deliveries.

3. Forestry Sector in Blagoevgrad and Kyustendil Regions (Statistical Data)

Introduction

The paper presents results of the analysis of data from the labour market statistics and business statistics of the National Statistical Institute for the period 2008 - 2015 for the regions of Blagoevgrad and Kyustendil.

According to the methodology of the National Statistical Institute, data on the structural business statistics are collected through the annual reports of non-financial enterprises during the reference year. These reports are two types - a complete set and a shortened version and their completion depends on the size of the enterprise and current national legislation:

- Annual Report on the Activities of Non-financial Enterprises Compiling Balance Sheets;
- Annual Activity Report of Non-Compiling-Balance-Sheets Entities.

Therefore, the information presented here is based on the data that is provided by the enterprises to NSI.

02.2 Logging

02.4 Support services to forestry

Figure 1.3. Number of enterprises in the Forestry and Logging division

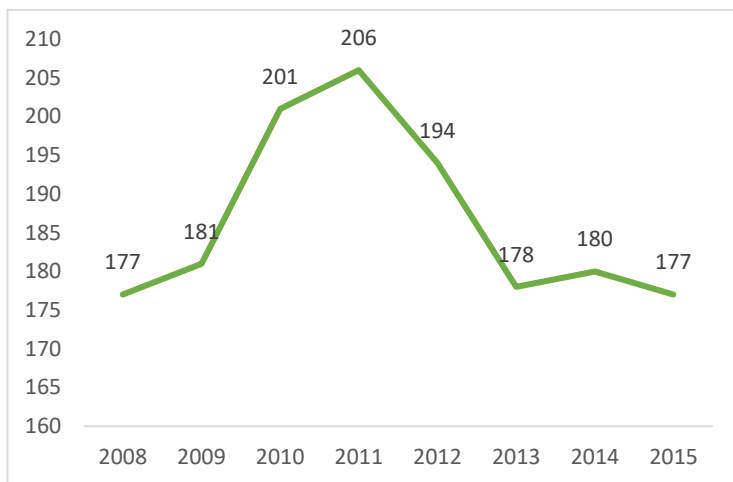
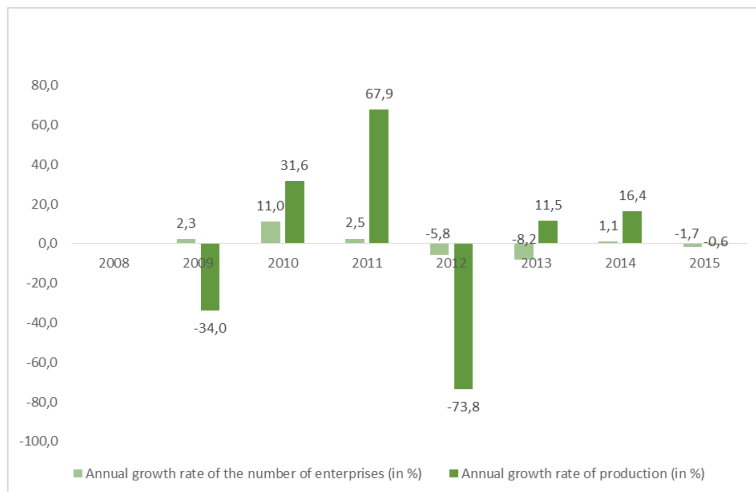


Figure 1.4. Annual growth rate of the number of enterprises and the production in % in the Forestry and Logging division

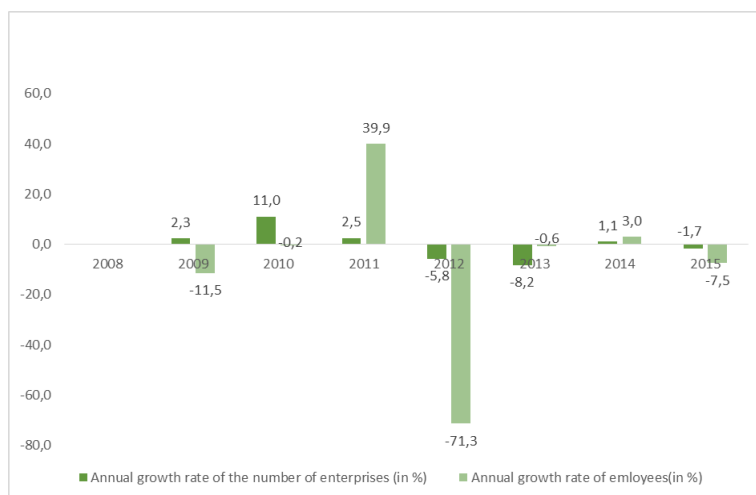


In the period 2008-2011 the number of enterprises in the division Forestry and Logging, according to NACE Rev. 2, increase. In 2008 in the Blagoevgrad and Kyustendil regions they are 177 and in 2011-2016. The rise in the number of

companies from the two divisions until 2011 is followed by a decline which goes on until 2013, when the firms are down to 178 and the total number is equal to the one from 2008. This level remains relatively constant until 2015 (177 companies). Despite the dynamics throughout the period considered, the number of enterprises in the classes at the beginning and end of the period is the same.

The changes in the production on an annual basis are similar to the variation of the number of enterprises in the division, but there are also differences. For example, contrary to the expectations due to the global financial crisis, in 2009 the number of enterprises increases by 2.3 percentage points. At the same time, production decreased by 34%. In 2011 the total number of enterprises in the division reaches its highest value, and then the growth in the production is the biggest. In 2013, the number of companies in the division change negatively (-8.2%) and the production goes up by 11.5%.

Figure 1.5. Annual growth rate of the number of enterprises and the employees in % in the Forestry and Logging division



The percentage change in the number of employees in the Forestry and Logging division in the regions of Kyustendil and Blagoevgrad follows the growth of the number of enterprises. At the beginning of the period under review, the growth of both indicators is the opposite: in 2009, enterprises increased and employees decreased, and in 2010 the number of enterprises increase while the employees retained their level from the previous year. In 2011 and 2012, the change in the number of employees is greater than the change in the number of companies operating in the division.

Figure 1.6. Production (BGN thousand) in the Forestry and Logging division

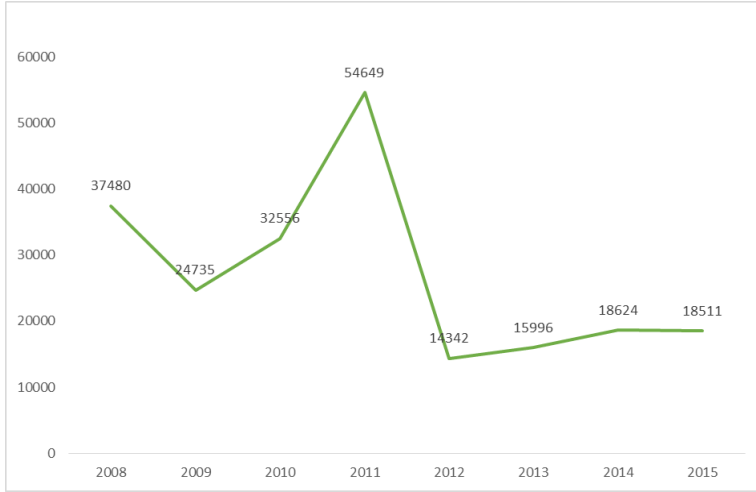
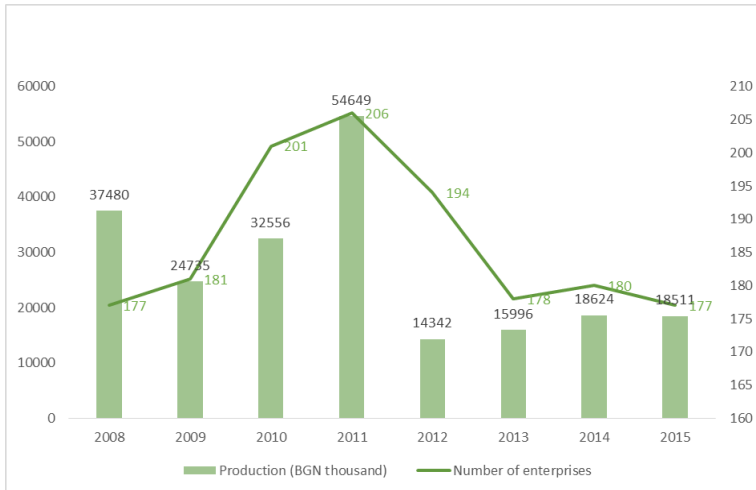


Figure 1.7. Production (BGN thousand) and number of enterprises in the Forestry and Logging division



Despite the increase in the number of enterprises in the sector in 2009, during the global financial crisis, the values of production, the value added at factor costs, the operating income and expenses, the net sales revenue, the fixed tangible assets, the employees, as well as the wages and salaries, are reduced. These indicators have

positive changes in the 2009-2011 period, reaching their highest point in 2011. There is a sharp decline in 2012. After the diminishing production, the number of enterprises in the sector fell down from 194 in 2012 to 178 in 2013. After 2012, there is a relative retention or an increase in the value of production and the value added at factor costs, which is observed until 2015. The changes in operating income and expenditure, employed persons and employees in the division, as well as in the wages and salaries, net sales revenue and turnover of enterprises are analogical to that of the forementioned indicators.

In the first year of the reviewed period there is high productivity in the division. The number of enterprises in 2008 is smaller than that in 2009 and 2010, and yet the value of the 2008 production is higher than in 2009 and 2010. The production value is the smallest in 2012 and the highest in 2011, when number of the enterprises in the division is the biggest.

Figure 1.8. Annual growth rate of production and employees (in %) in the Forestry and Logging division



The annual growth rate of the persons employed in the enterprises in the division correlates with the growth of the production on an annual basis. 86% of the increase in the value of production is determined by the increase in the number of employees in the sector. Typical of the period under review is that the annual increase in output is higher than the annual rise in the number of employees.

Figure 1.9. Annual growth rate of production and operating income (in %) in the Forestry and Logging division

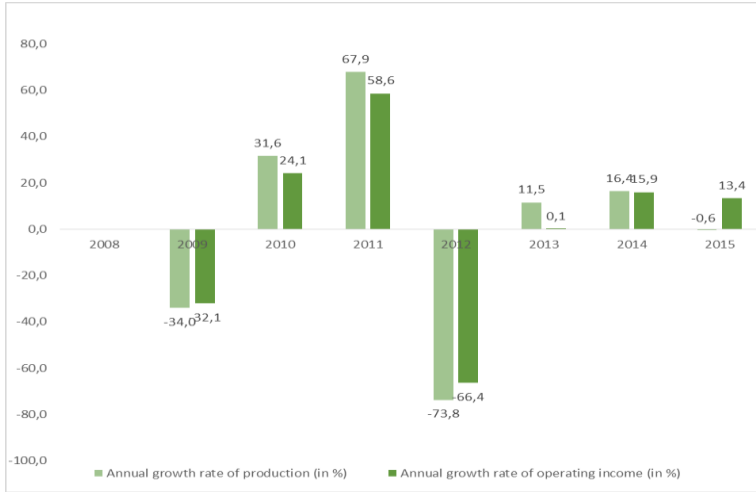
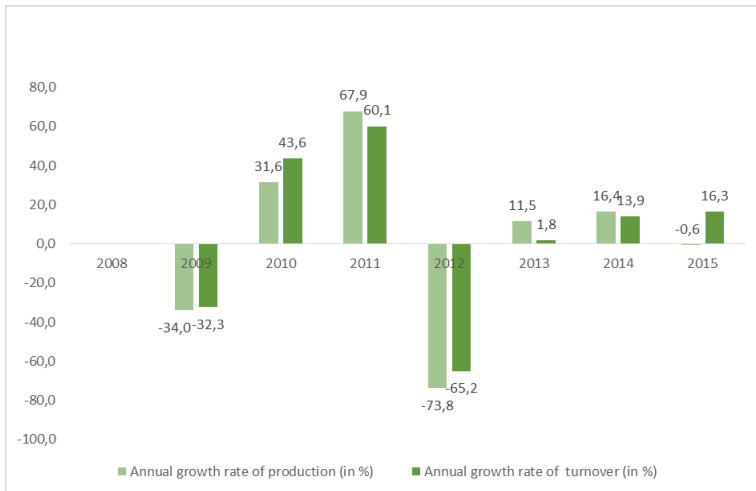


Figure 1.10. Annual growth rate of production and turnover (in %) in the Forestry and Logging division



During the monitored period, the annual growth of production is higher than the change in operating income. Only in 2015 the production decreases and the operating income in the logging sector increases.

For the 2008-2015 period, the annual changes in the production are both positive and negative and they are greater than the changes in turnover in the logging division during most of the time. In 2015, the production decreases and the turnover increases – the sold production, goods and services are more than the production during the current period.

Figure 1.11. Value added at factor costs (BGN thousand) in the Forestry and Logging division

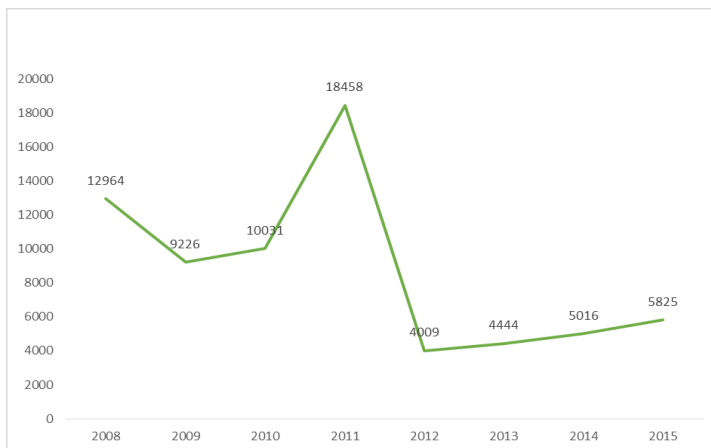


Figure 1.12. Operating income and expenses (BGN thousand) in the Forestry and Logging division

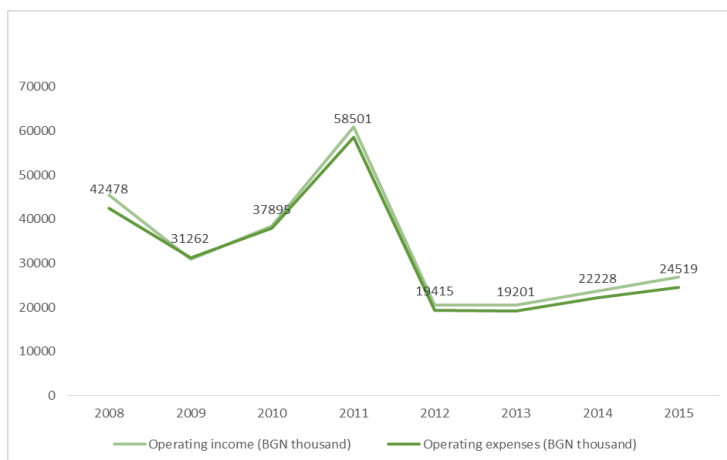


Figure 1.13. Fixed tangible assets (BGN thousand) in the Forestry and Logging division

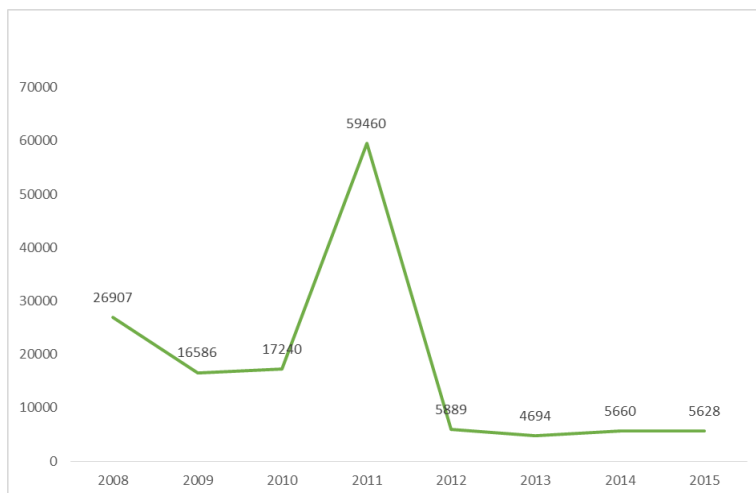


Figure 1.14. Employed persons and employees in the Forestry and Logging division

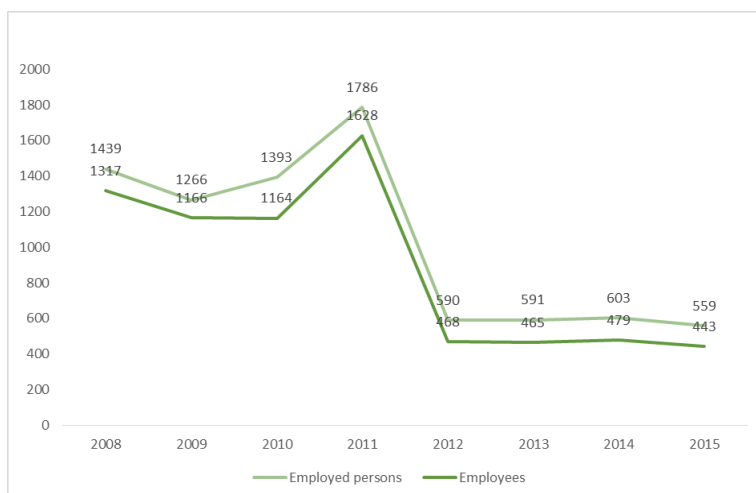


Figure 1.15. Net sales revenue (BGN thousand) in the Forestry and Logging division

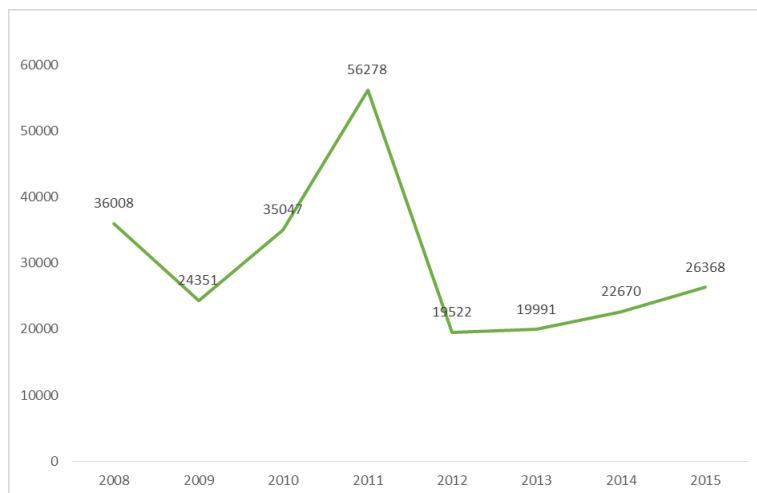
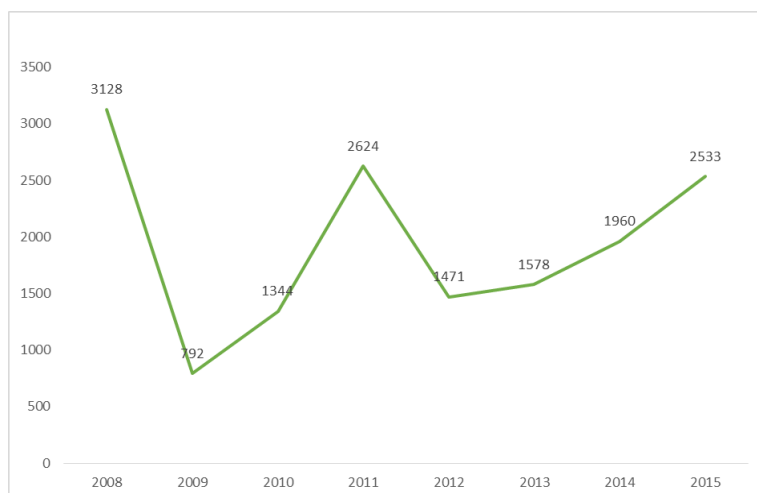


Figure 1.16. Profit (BGN thousand) in the Forestry and Logging division



Following the dynamics of the other economic indicators, the profits in the division decreased sharply at the beginning of the period, reaching BGN 792,000 in 2009 from a total of BGN 3.1 million for all enterprises. There is a rise in the value of the indicator

until 2011 and a decline in 2012, again followed by an increase observed until the end of the period under review. The loss in the division in 2008 was BGN 355 thousand, and in 2009 it rose to BGN 1.3 mln. In 2009-2013, the loss in the sector decreased, in 2014 it increased and in 2015 its growth was negative.

Figure 1.17. Loss (BGN thousand) in the Forestry and Logging division

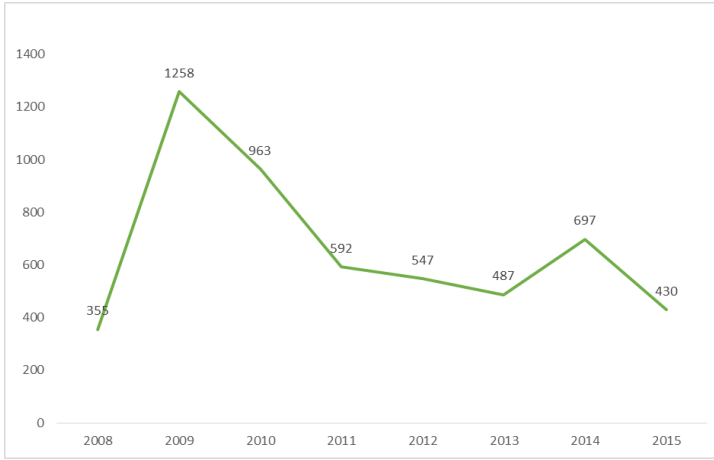
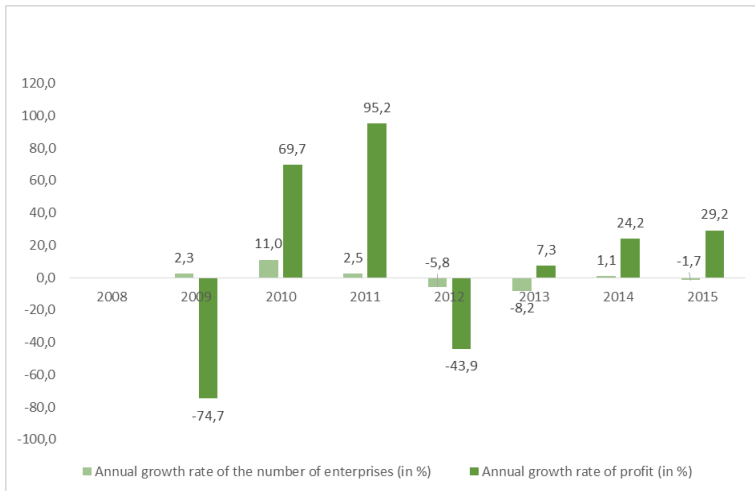


Figure 1.18. Annual growth rate of the number of enterprises and profit (in %) in the Forestry and Logging division



It is interesting to observe the change in the profit in the division and the link with the number of enterprises or production. For example, the reason for the increase in profit may be either the greater productivity of companies or an increasing number of firms in the division. For most of the years from the period under review, changes in the number of enterprises and profits are in the same direction: the more the companies in the division are, the bigger increase in profit. There are opposite changes in the annual growth rate of the number of companies and the profit. A possible reason for that is the increased or decreased productivity of the companies in the logging division.

Figure 1.19. Annual growth rate of production and profit (in %) in the Forestry and Logging division



The relationship between the annual growth rate of production and annual growth of profit is strong. 75.9% of annual profit changes are due to the annual variation in production. For example, in 2009, production declined by 34% and the profit was down by 74.7%. In 2010, the positive change in production could be linked to more than double growth in profits in the logging division. Increased production, respectively, productivity and efficiency of production processes can significantly improve profits in the division.

Figure 1.20. Net sales revenue and profit (BGN thousand) in the Forestry and Logging division

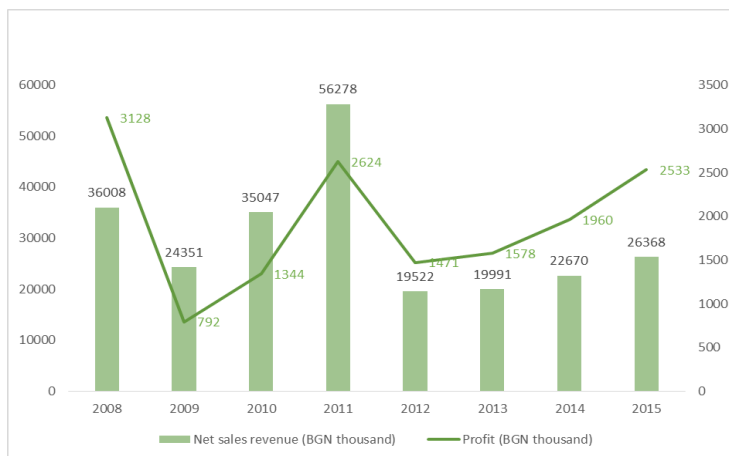
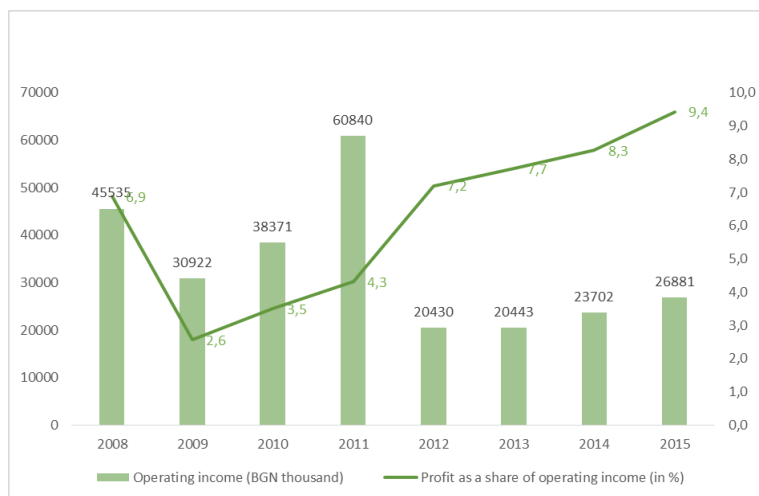
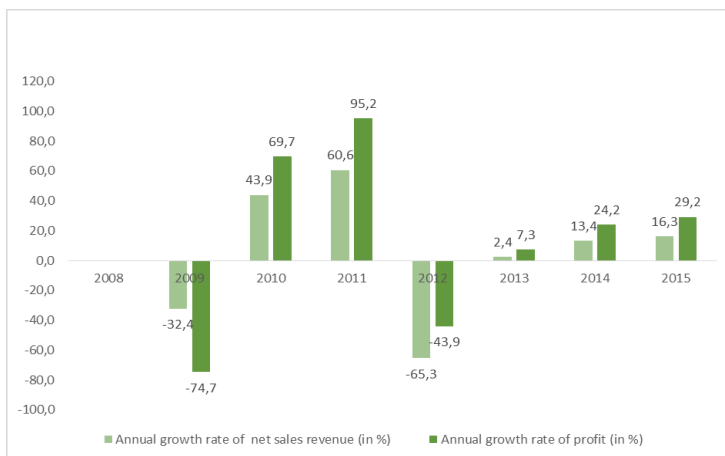


Figure 1.21. Operating income and profit as a share of operating income (BGN thousand) in the Forestry and Logging division



Profit in the logging division follows the movement of the values in net sales revenue. Profit as a share of operating income in the division declined in 2009 in the context of the ongoing financial crisis and then increased from 2.6% of operating revenue in 2009 to 9.4% of sales revenue in 2015.

Figure 1.22. Annual growth rate of net sales revenue and profit in % in the Forestry and Logging division



Net sales revenue and profit change in the same direction throughout the period that is considered. With the increase in net sales revenue, profits also increase and, in the case of a decline in net sales revenue, profit in the division is decreasing. The annual growth of net sales revenue and turnover in the logging division is almost identical. The nominal values of net sales revenue and turnover are almost the same.

Figure 1.23. Turnover (BGN thousand) in the Forestry and Logging division



Figure 1.24. Annual growth rate of net sales revenue and turnover in % in the Forestry and Logging division

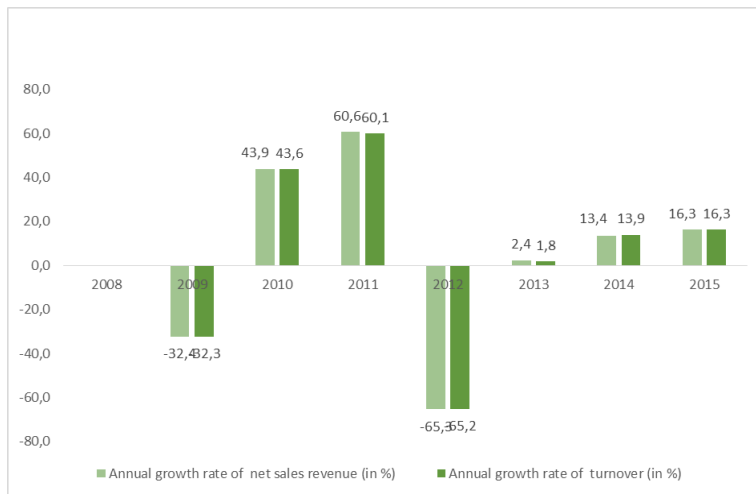


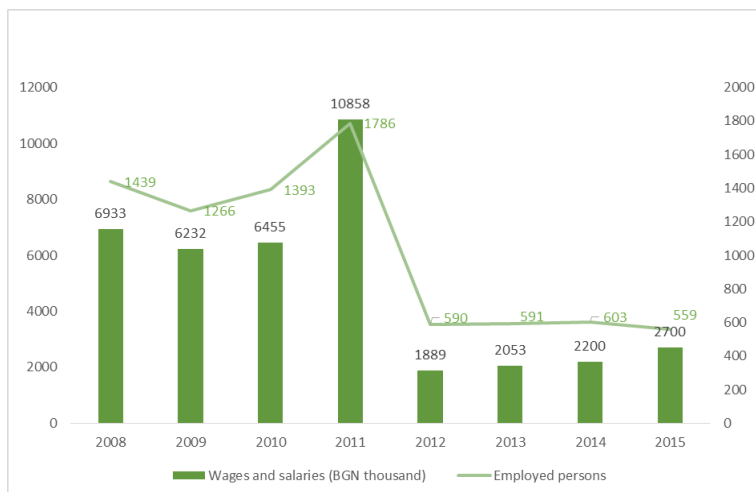
Figure 1.25. Net sales revenue and turnover (BGN thousand) in the Forestry and Logging division



Figure 1.26. Wages and salaries (BGN thousand) in the Forestry and Logging division



Figure 1.27. Wages and salaries (BGN thousand) and employed persons in the Forestry and Logging division



Wages and salaries and employees change in a similar way, the higher wages and salaries of companies happen when the number of employees in the division increases.

Figure 1.28. Annual growth rate of employed persons and wages and salaries in % in the Forestry and Logging division

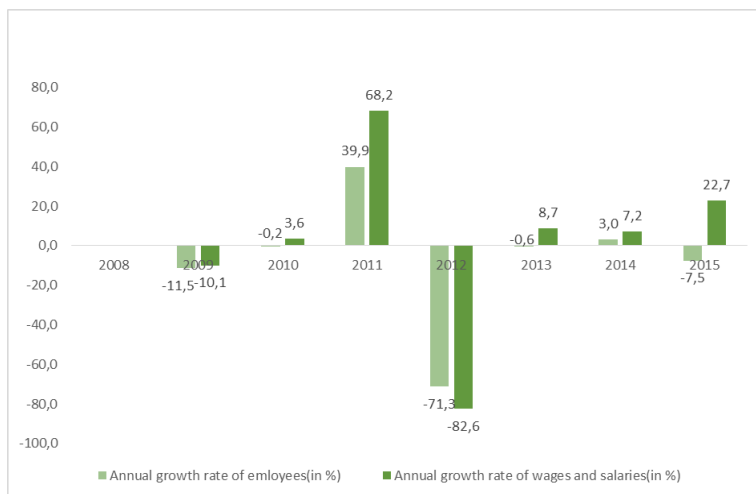
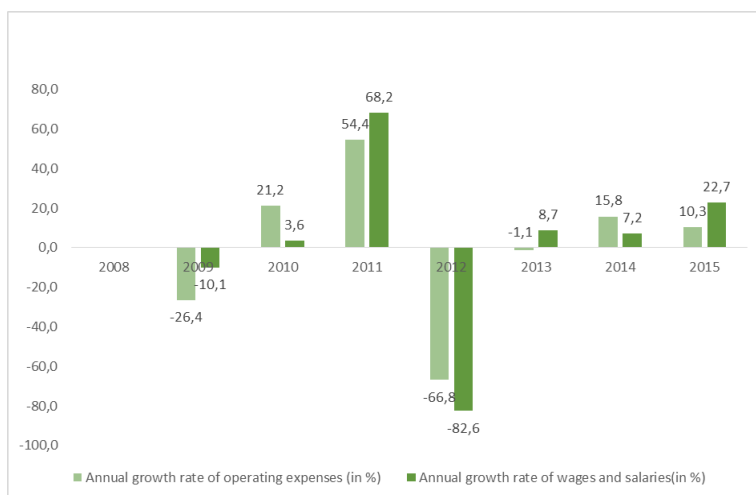


Figure 1.29. Annual growth rate of operating expenses and wages and salaries in % in the Forestry and Logging division



Changes in the employed persons and wages and salaries in the division follow a similar rate of change. In 2011, wages and salaries increase by 68.2%, and employees – by 39.9%. The change in the wages and salaries raises by almost double the positive change in the number of employed persons in the reviewed classes. The difference between the two indicators is the largest in 2015 - then the wages and salaries increase by 22.7% and the annual change in the number of employed persons is -7.5%.

In the logging division, the operating expenses and the wages and salaries follow the same dynamics. Changes in operating expenses may be observed, and they are higher than the one in the annual growth rate of the wages and salaries. In addition, over the years, the annual growth of rate of wages and salaries over the period under review exceeds the annual changes in operating expenses.

Figure 1.30. Average wages and salaries per employed person in an enterprise (BGN thousand) in the Forestry and Logging division



The indicator average annual wages and salaries per employee in an enterprise is calculated as the average annual wages and salaries of an enterprise in the logging sector divided by the average number of employees in a company. The average annual wages and salaries per employee in an enterprise follows the change in the number of enterprises in the sector. The figures for 2008 and 2015 are almost identical, despite the changes during the period that is considered. The growth in the number of enterprises as well as in the production of the sector since 2011 is also followed by an increase in the average annual wages and salaries per employee in an enterprise. The subsequent decline led to a reduction in the average wage by half.

**Manufacture of wood and of products of wood and cork, except furniture;
manufacture of articles of straw and plaiting materials**

For the purposes of this analysis the division Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials, including the classes

16.10 Sawmilling and planning of wood

16.21 Manufacture of veneer sheets and wood-based panels

16.22 Manufacture of assembled parquet floors

16.23 Manufacture of other builders' carpentry and joinery

16.24 Manufacture of wooden containers

16.29 Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials

is grouped with the class

43.32 Joinery installation

according to NACE Rev. 2.

In spite of the global crisis, in 2009 the total number of enterprises operating in some of the abovementioned classes according to NACE Rev. 2 grows. There is a gradual increase and the number of companies increases by 17.2%, from 262 in 2008 to 307 in 2009. In 2010, their total number decreased to 264, reaching the levels from 2008. During the period 2011-2015, the firms operating in the wood manufacturing division in the regions of Blagoevgrad and Kyustendil are on the rise and their number reaches its highest value in 2015 – 317.

Figure 1.31. Number of enterprises in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

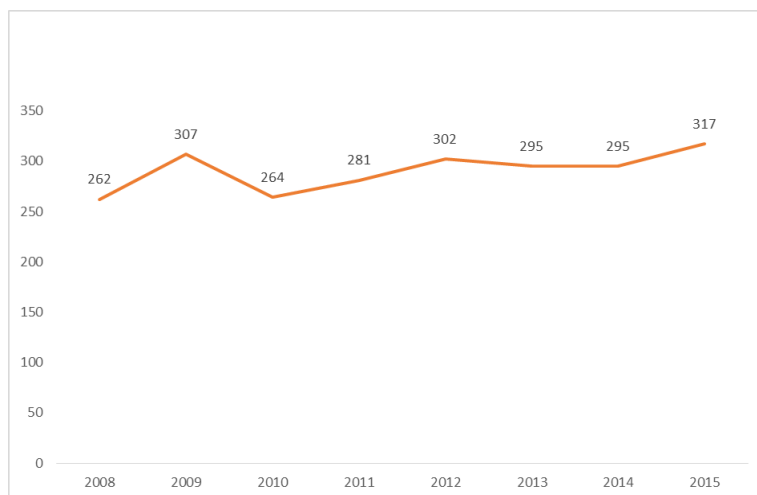
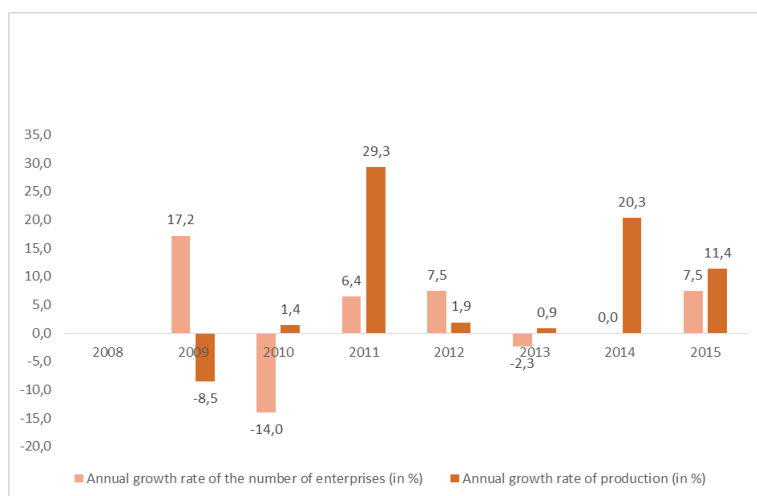
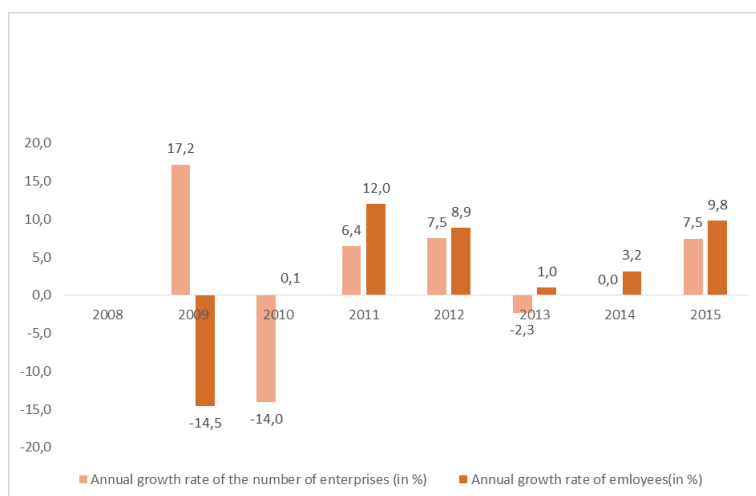


Figure 1.32. Annual growth rate of the number of enterprises and the production in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



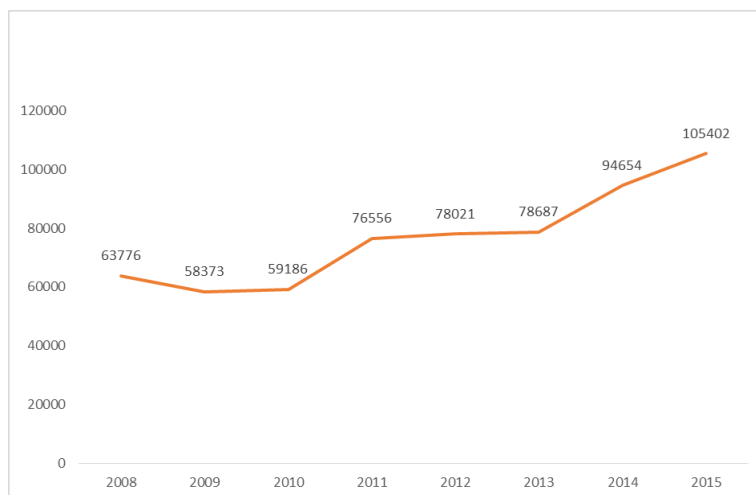
The number of enterprises in the division increases by 17.2% in 2009, while the production decreased by -8.5%. A probable reason for this is the reduced productivity of the companies in the studied classes in the regions of Blagoevgrad and Kyustendil. In 2010, the rate of change is the opposite – the value of the production increases and the total number of businesses in the division decreases. In 2011 is observed the highest growth in the production – 29.3%, while the positive change in the number of enterprises in the same year is 6.4%.

Figure 1.33. Annual growth rate of the number of enterprises and the employees in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



During the period under review, the growth of the number of enterprises and employees has changed both in the same and in the opposite directions. In 2009, companies in the sector grew by 17.2% and employees decreased by 14.5%. For the rest of the period, the number of employees increased by more than the annual change in the number of enterprises.

Figure 1.34. Production (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



The value of production in the division remains relatively constant for the period 2008-2010, and from 2011 to 2015 there is an increase. The value added at factor costs, the operating income and expenses, the net sales revenue and the turnover tend to move in an analogical way. The change in the number of employed persons and employees is similar, with the only difference being observed in 2009 – then the number of employees in the wood manufacturing division decreases, and afterwards, by 2015 their number is on the rise.

In the division and period that are studied, increases in the total number of enterprises are accompanied by rising in the value of production. Exceptions are the years 2009 and 2010: in 2009 the number of firms in the division grows significantly and production decreases; In 2010 companies in the NACE Rev. 2 division are less, but produce more than the previous year. For the rest of the period, the growth of the number of enterprises is in line with the increase in production.

Figure 1.35. Production (BGN thousand) and number of enterprises in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

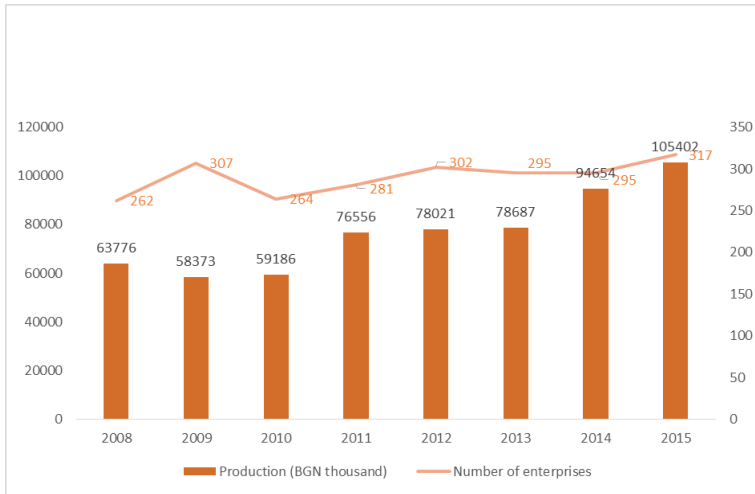
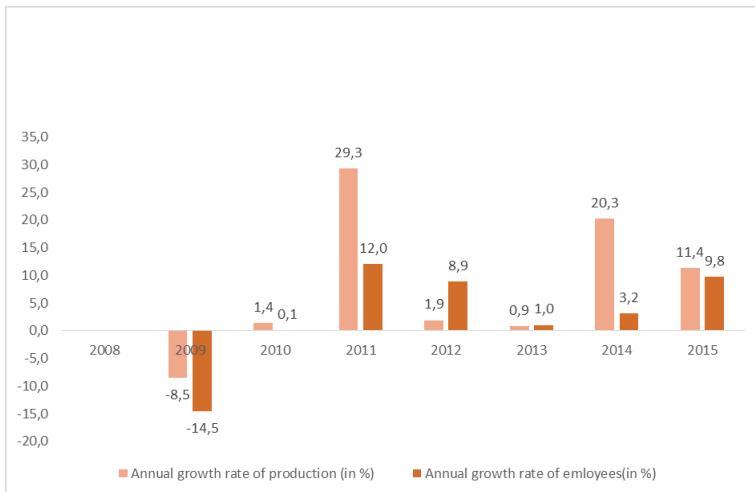
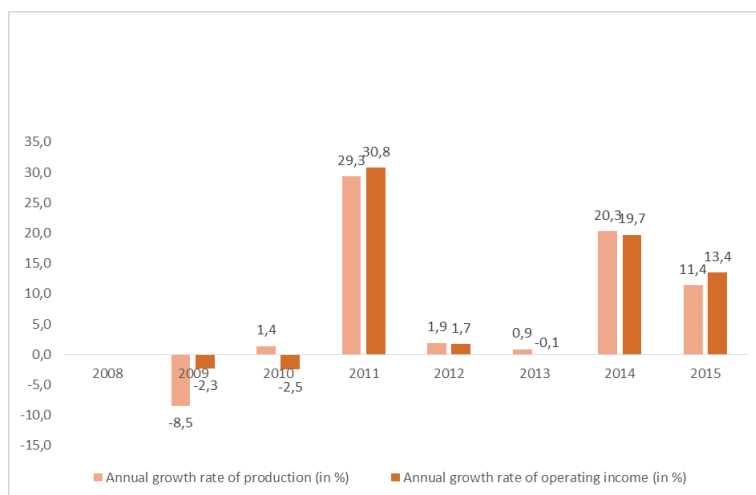


Figure 1.36. Annual growth rate of production and employees (in %) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



In 2009, despite the significant decline in the number of employees in the division, the production decreases by less than the change in the number of employees – they go down by 14.5% and the production - by 8.5%. In spite of the expectation that the increase in the number of employees in the enterprises should lead to a rise in production, a reverse trend could be traced in 2012 and 2015. Then the growth in employees is higher than the percentage change in production.

Figure 1.37. Annual growth rate of production and operating income (in %) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



Changes in the annual growth rate of production and operating income in the wood producing division in Kyustendil and Blagoevgrad go in one direction and are almost identical over most of the period under consideration. The more is produced, the more revenue is generated. The division recorded the largest annual growth rate of production and operating income in 2011, respectively 29.3% and 30.8%. The annual percentage increase in production and turnover is similar: the more it is produced, the higher the turnover in the division.

Figure 1.38. Annual growth rate of production and turnover (in %) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

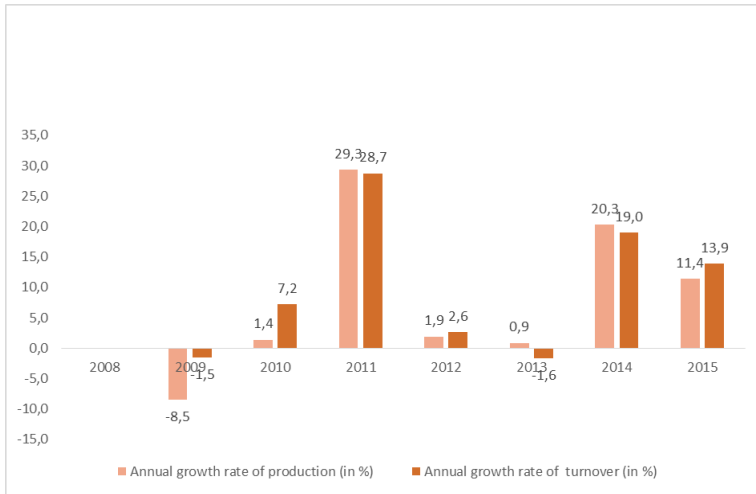


Figure 1.39. Value added at factor costs (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

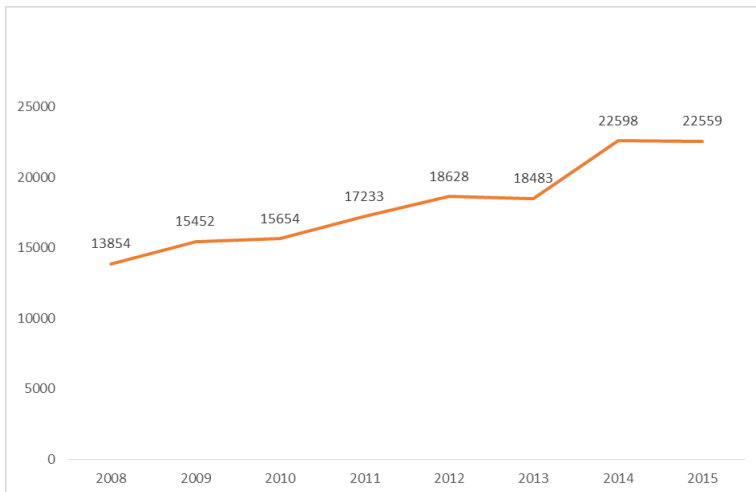


Figure 1.40. Operating income and expenses (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

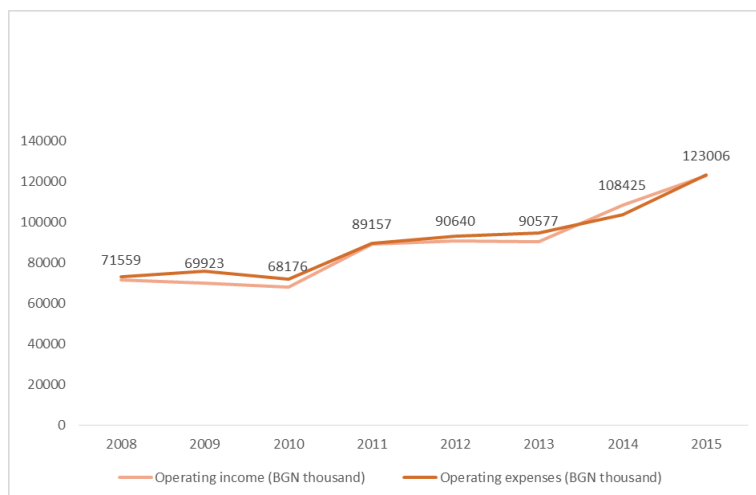
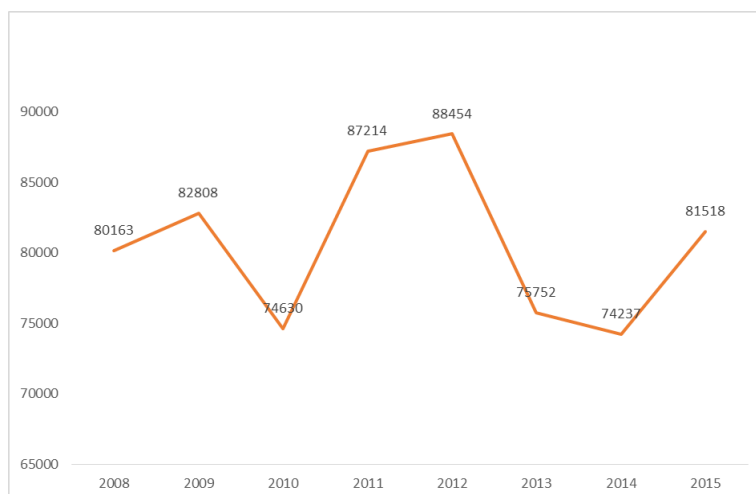
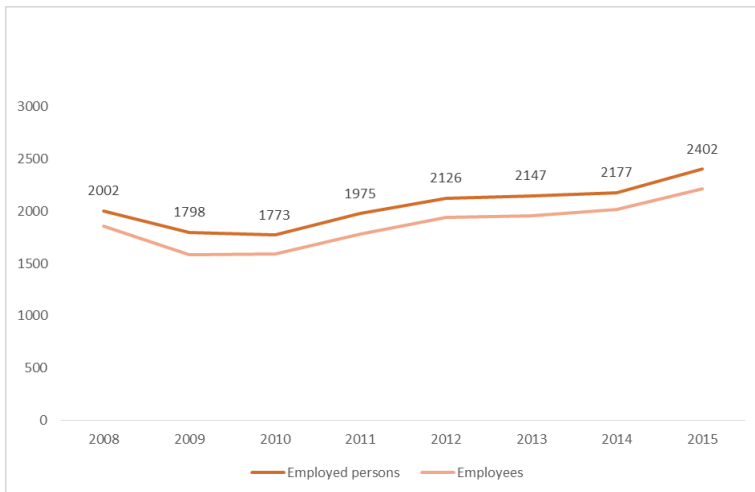


Figure 1.41. Fixed tangible assets (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



The fixed tangible assets owned by the businesses in the division changed dynamically from 2008 to 2015, but their values at the beginning and end of the period remained similar despite the large differences that occurred in between. In 2009 there could be observed growth, followed by a decline in 2010. In 2011 and 2012, fixed tangible assets grow and in 2013 and 2014 they decline. The increase in 2015 reaches the 2008 figures. The dynamics of the fixed tangible assets in the wood manufacturing division follows the changes in the number of enterprises, but the movement of the values of the assets are more pronounced. Together with the increase in the number of enterprises in the division there is an increase in the fixed tangible assets owned by the companies as well. Their presence is essential for the production process in the wood manufacturing division.

Figure 1.42. Employed persons and employees in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



The changes in net sales revenue, as well as in the employed persons and employees in the division, follow the dynamics of production.

Figure 1.43. Net sales revenue (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

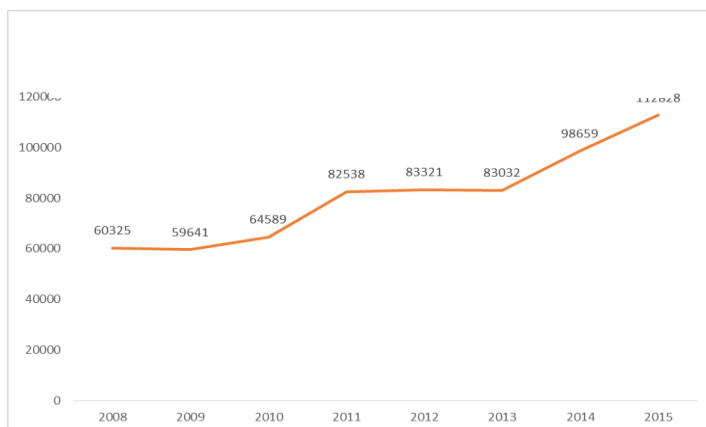
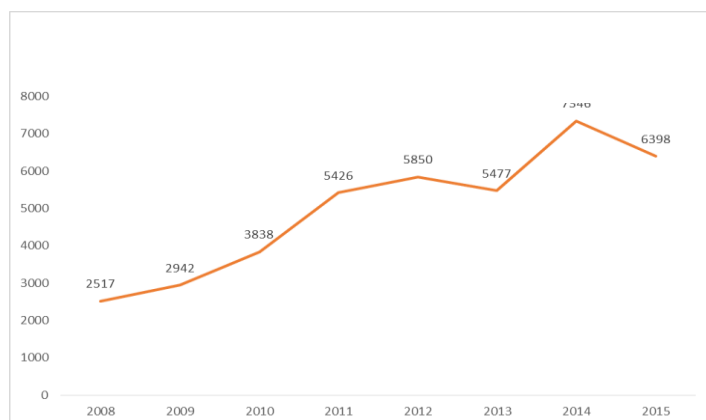


Figure 1.44. Profit (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



Profit in the sector increases in the period 2008-2015, with a slight decline in 2013, followed by an increase in 2014 and again a decrease in 2015. The profit at the end of the period has increased its value 2.5 times from its start. For the 8 years that were studied, the industry has been able to generate double profits over the first few years. In 2014, profit in the division are the highest.

Figure 1.45. Loss (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

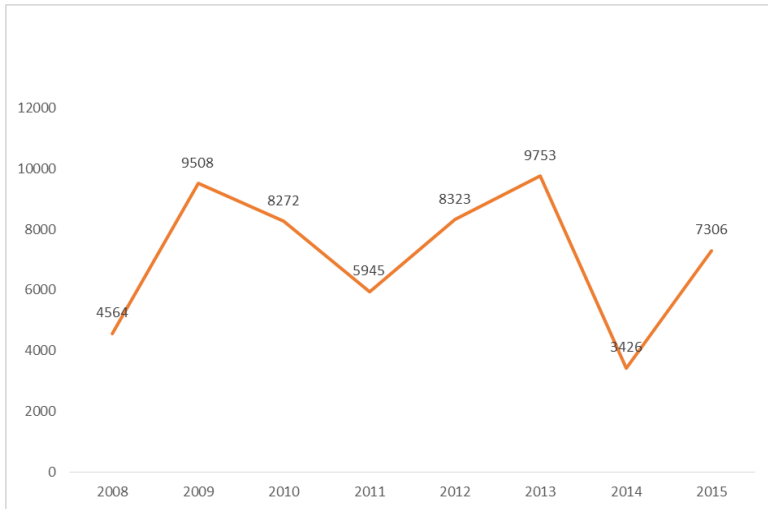
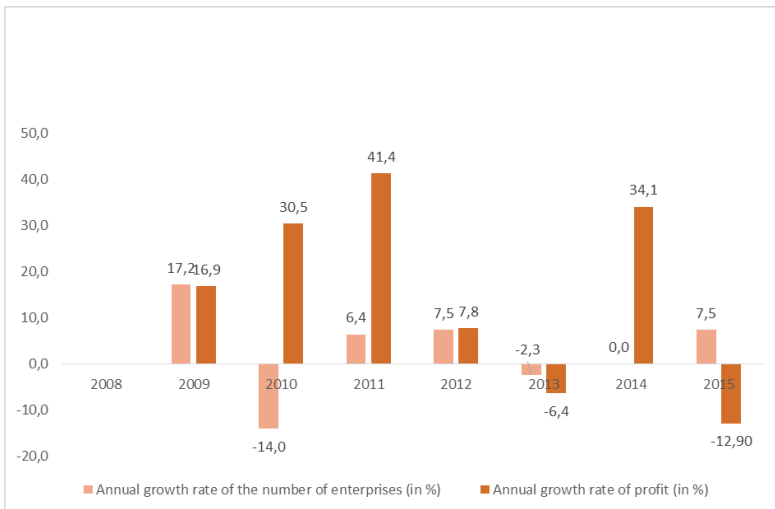


Figure 1.46. Annual growth rate of the number of enterprises and profit (in %) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



Loss in the division follows alternating peaks and drops. In 2009, the loss increases significantly and decreases in 2010 and 2011. Until 2013, it rises again to reach its 2009 levels, followed by a sharp decline in 2014. The value of the loss for 2015 grows compared to 2014.

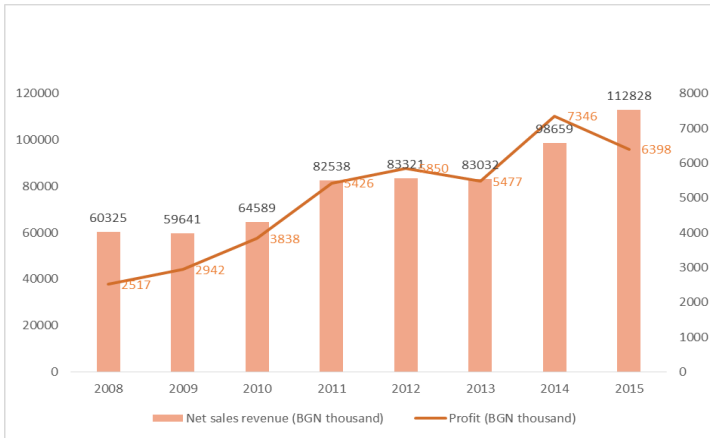
The growth of the profit in the division may be due to both the growing number of enterprises and to increased productivity and / or greater production. At the beginning of the period under review, in 2009, the number of enterprises and profit vary positively in almost identical ways. In 2010, despite the sharp decline in companies operating in the wood production in Blagoevgrad and Kyustendil, the profit increased significantly. This increase in profit is retained and even rises in the coming 2011, with the number of companies in the division also growing. In 2012, the change in both of the indicators is approximately equal (growth of around 7.5%). At the end of the period profit increases by more (both positively and negatively) than the growth rate in the number of enterprises. Larger increases in profits compared to the annual growth rate in the number of enterprises may be due to increased efficiency.

Figure 1.47. Annual growth rate of production and profit (in %) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



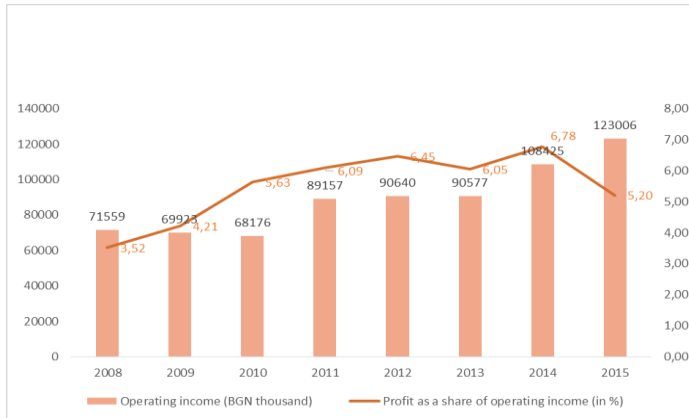
For most of the period under review, the growth rate of production means a larger increase in profit on an annual basis.

Figure 1.48. Net sales revenue and profit (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



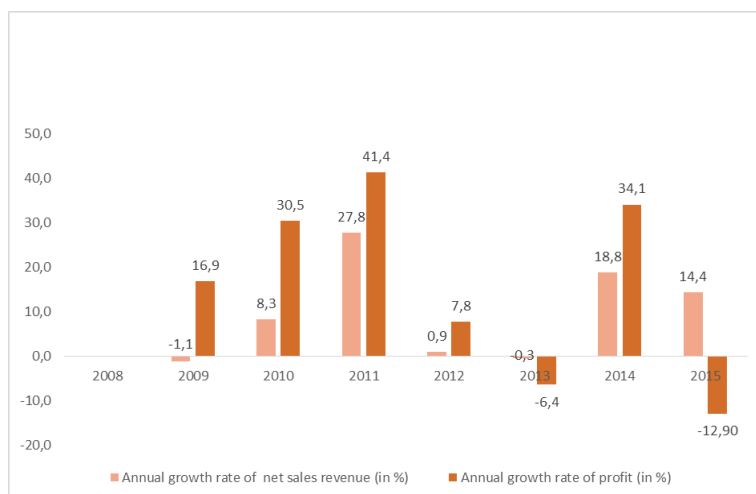
Net sales revenue and profits in the division change in a similar manner, increasing gradually over the period under review, doubling the starting values by the end of the period.

Figure 1.49. Operating income and profit as a share of operating income (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



Operating income, net sales revenue, and profits are subject to similar rates of change. Profit, expressed as a percentage of operating income in the division, increased during the period 2008 - 2015. In 2008, its percentage was 3.5% of the operating income of the enterprises in the division. In 2014, profits reached their highest value – 6.8% of operating income. In 2015, earnings amounted to 5.2% of the operating income in the division. In almost all years of the period under review the annual growth of profit is higher than that of net sales revenue. The biggest difference between the annual growth of both of the indicators is observed in 2010, when the profit changes with 30.5 percentage points and the net sales revenue by 8.3%.

Figure 1.50. Annual growth rate of net sales revenue and profit in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



During most of the time within the studied period, profit increases by more than annual growth of the net sales revenue. Businesses are able to sell more and at the same time generate greater profit.

Figure 1.51. Turnover (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

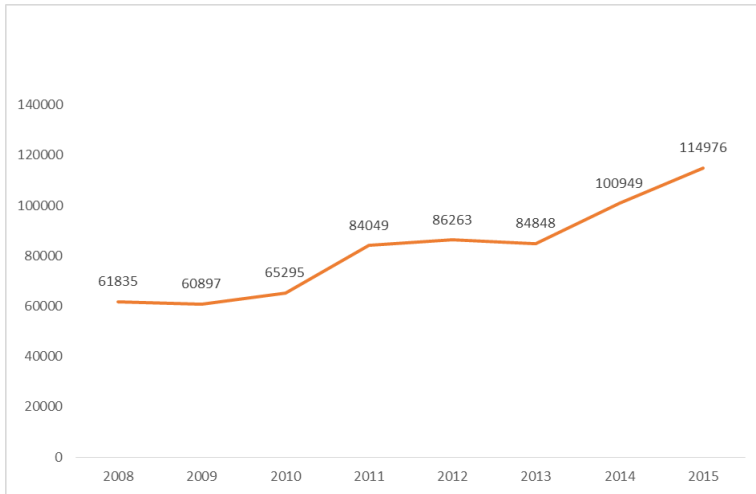
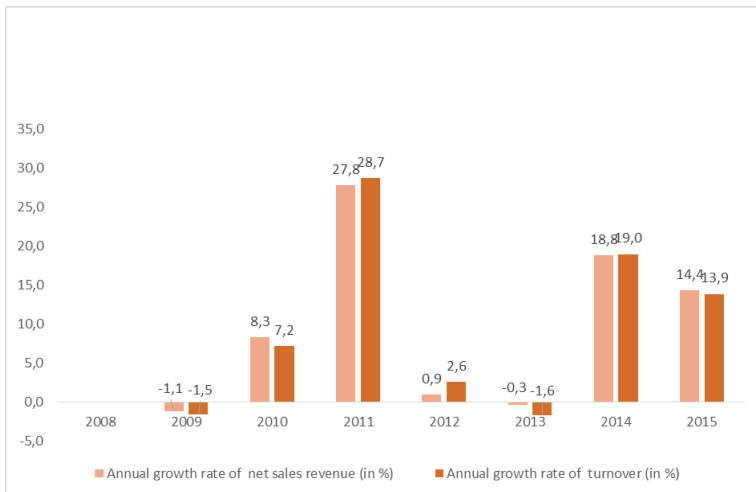


Figure 1.52. Annual growth rate of net sales revenue and turnover in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



In the wood-producing division in the regions of Blagoevgrad and Kyustendil, net sales revenue and turnover increase at an identical rate on an annual basis.

Figure 1.53. Net sales revenue and turnover (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

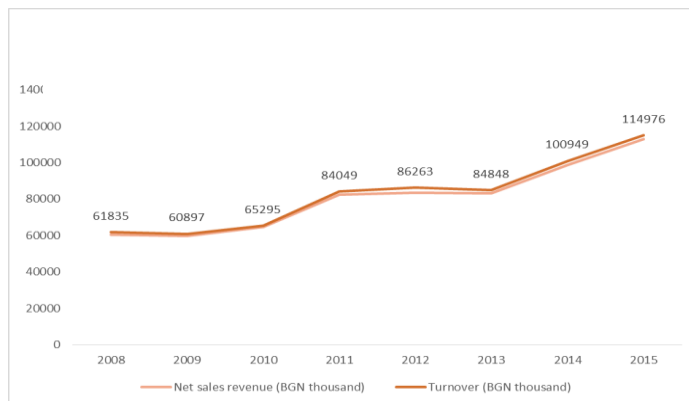
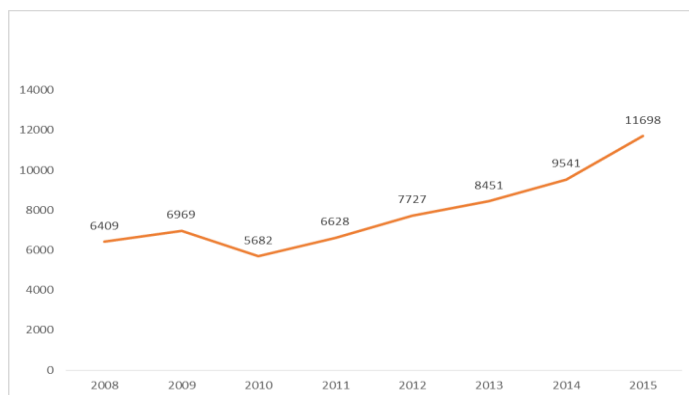


Figure 1.54. Wages and salaries (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



Wages and salaries in the division follow the changes in the value of production. There is a gradual increase as the values of wages and salaries are doubled at the end of the period (compared to the original level). The reasons for the increase can be a rise in the number of employees in wood production or growing salaries per employee. Wages and salaries and employed persons in the division experience a similar change over the period that is considered.

Figure 1.55. Wages and salaries (BGN thousand) and employed persons in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials

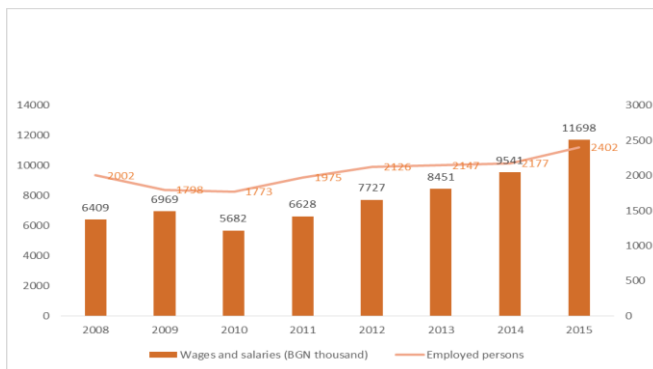


Figure 1.56. Annual growth rate of employed persons and wages and salaries in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



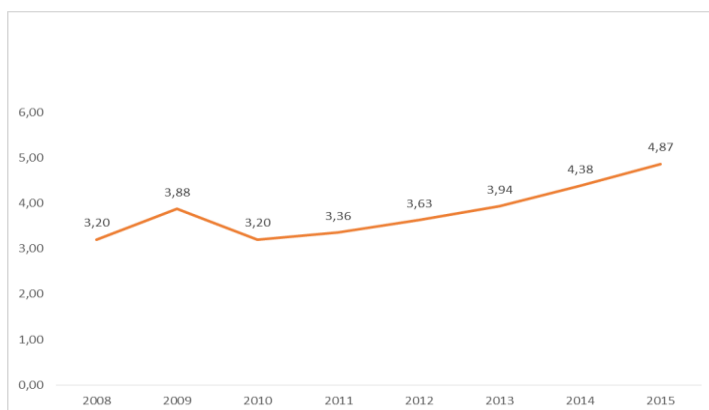
The growth rate of the number employees is accompanied by a higher annual percentage increase in wages and salaries over the period 2011-2015. In 2009, the employed persons in the wood manufacturing division sharply decreased by 14.5%, while wages and salaries increased by 8.7%. In 2010, wages and salaries varied by 18.5%, and the number of employees reached an annual percentage change of 0.1%. Over the rest of the period, wages and salaries increase by more than the rise in the number of employees.

Figure 1.57. Annual growth rate of operating expenses and wages and salaries in % in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



The growth rate of wages and salaries over the period is higher than that of operating expenses. Only in 2011 the operating expenses change with more than the wages and salaries.

Figure 1.58. Average wages and salaries per employed person in an enterprise (BGN thousand) in the division of Manufacture of Wood and of Products of Wood and Cork, Except Furniture; Manufacture of Articles of Straw and Plaiting Materials



The average annual wages and salaries per employee in an enterprise are gradually increasing. The value from the beginning of the period increases 1.5 times until the end of it.

Manufacture of paper and paper products

The classes that are being reviewed from the Manufacture of paper and paper products division are the following:

17.11 Manufacture of pulp

17.12 Manufacture of paper and paperboard

17.21 Manufacture of corrugated paper and paperboard and of containers of paper and paperboard

17.22 Manufacture of household and sanitary goods and of toilet requisites

17.23 Manufacture of paper stationery

17.24 Manufacture of wallpaper

17.29 Manufacture of other articles of paper and paperboard

The number of enterprises operating in the paper, cardboard and paper products division in the regions of Blagoevgrad and Kyustendil remain relatively stable for the period 2008 - 2015. In 2009 it grew significantly (from 35 to 48 companies) and in 2010 there was a slight decline (43 enterprises). By 2015, the number of firms in the division stays relatively unchanged and by the end of the period they are 44. Therefore, the division can be defined as sustainable.

Figure 1.59. Number of enterprises in the Manufacture of Paper and Paper Products division



Figure 1.60. Annual growth rate of the number of enterprises and the production in % in the Manufacture of Paper and Paper Products division



In 2009 the growth in the number of enterprises as well as in the production on an annual basis was the largest for the period under review. The companies in the division increase by 37.1% in 2009 and their production grows by 29.5% compared to the previous year. In 2010 the number of enterprises in the sector decreases and production is on the rise. There is a similar increase in the growth of both indicators in 2011. In 2012 the value of production goes down and the number of enterprises operating in the division stays the same. There are relatively small changes in the number of companies, accompanied by a significant increase in the production levels in 2013 and 2014. In both years, the reviewed indicators increase by 2.3% compared to the previous year.

Throughout the period, the annual change in the number of employees is higher than the growth in the number of enterprises. An exception is the year 2009 when companies in the paper division increase by more than the number of employees. In 2012 there is a retention of the number of firms operating in the division and a significant drop in the number of employees.

For the rest of the considered economic indicators, the dynamics of change are greater than the change in the total number of enterprises operating in the division. Production, value added at factor cost, operating income and expenses, employed persons and employees, and wages and salaries as well as net sales revenue and

turnover in the division are moving in a similar way. From 2008 to 2011 there is an increase, followed by a decline in 2012 and again positive growth that lasts until 2015.

Figure 1.61. Annual growth rate of the number of enterprises and the employees in % in the Manufacture of Paper and Paper Products division



Figure 1.62. Production (BGN thousand) in the Manufacture of Paper and Paper Products division

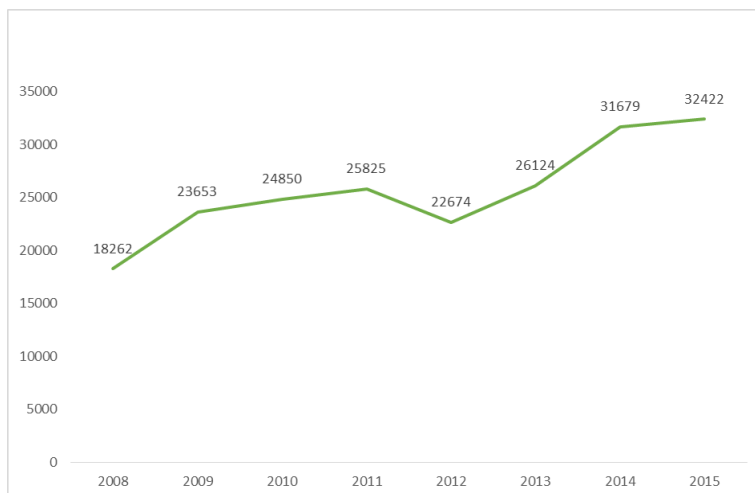
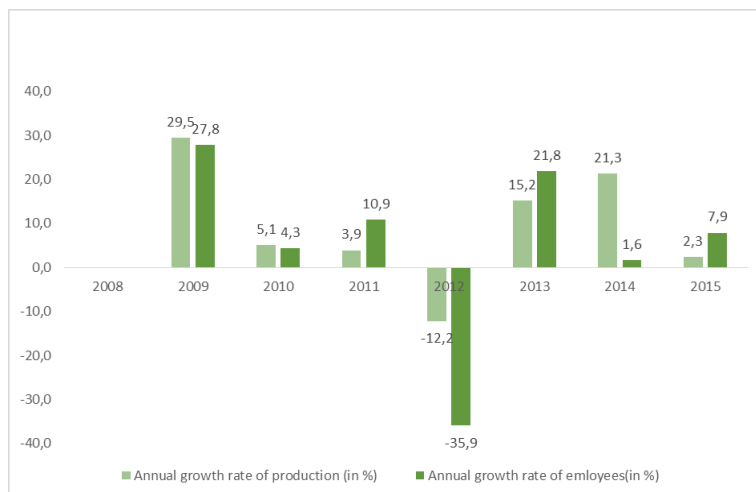


Figure 1.63. Production (BGN thousand) and number of enterprises in the Manufacture of Paper and Paper Products division



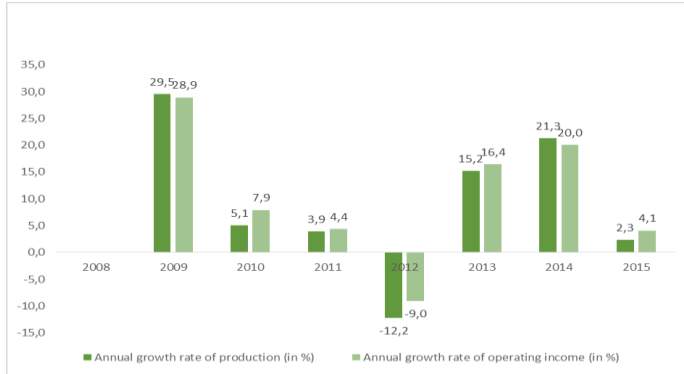
The value of production and the number of enterprises operating in the paper division in the Blagoevgrad and Kjustendil regions are changing in a similar way: the increase in the number of companies coincides with the rise in production. In the last two years of the monitored period, the number of businesses in the division has stayed the same and the production output has been growing – organizations have become more productive and managed to produce more.

Figure 1.64. Annual growth rate of production and employees (in %) in the Manufacture of Paper and Paper Products division



The annual growth rate of production and employees for 2008-2015 follows a similar trend, with either both indicators growing at approximately the same rate for the vast majority of the period, or the number of employees change more than the change in production. In 2012, there is a decline in both production and the number of employees, which is offset in the following year.

Figure 1.65. Annual growth rate of production and operating income (in %) in the Manufacture of Paper and Paper Products division



The change in annual growth rate of production and operating income is approximately the same. Higher value of production in the division may also be associated with higher operating income. The results of the comparison between the growth rate of production and turnover are similar, with turnover rising more than production.

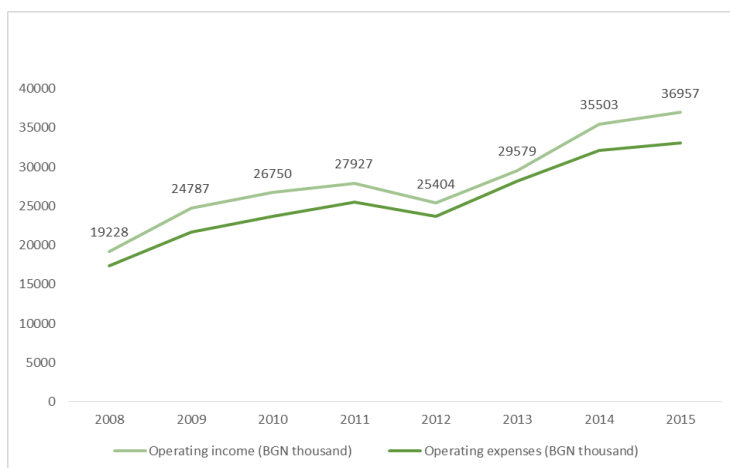
Figure 1.66. Annual growth rate of production and turnover (in %) in the Manufacture of Paper and Paper Products division



Figure 1.67. Value added at factor costs (BGN thousand) in the Manufacture of Paper and Paper Products division

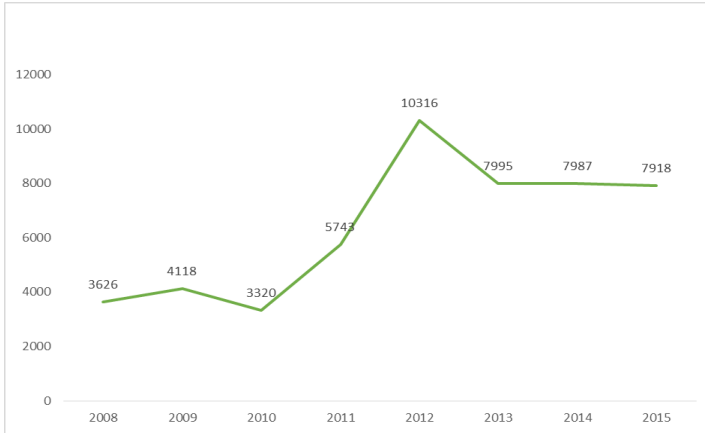


Figure 1.68. Operating income and expenses (BGN thousand) in the Manufacture of Paper and Paper Products division



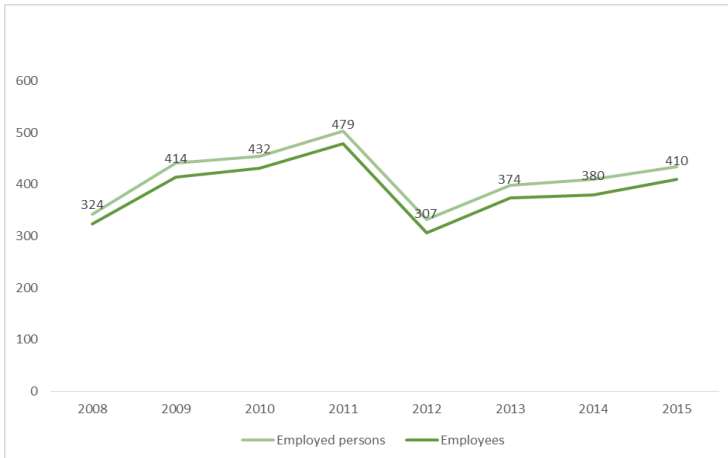
From 2008 to 2011, operating income and expenses in the paper division increasing. There is a slight decline in 2012 and then there is growth until 2015. Operating revenue exceeds operating expenses and the 2008 figures for both the indicators are doubled by the end of the period under review.

Figure 1.69. Fixed tangible assets (BGN thousand) in the Manufacture of Paper and Paper Products division



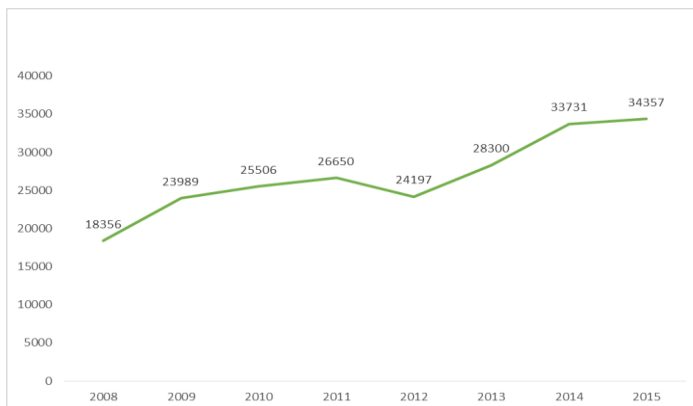
Unlike the timber production division, the fixed tangible assets owned by the companies do not tend to move according to the changes in the total number of companies in the division. The value of total fixed tangible assets of enterprises in the paper division increases from 2008 to 2012 - after a decline from 2010, there is a significant increase. In 2013, the value of fixed tangible assets decreases and by 2015 levels remain the same.

Figure 1.70. Employed persons and employees in the Manufacture of Paper and Paper Products division



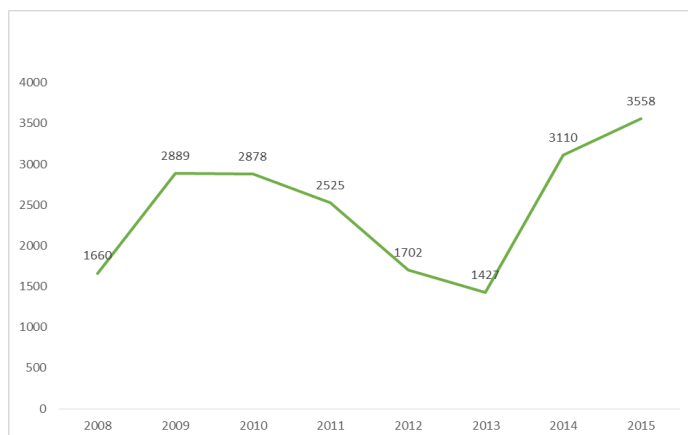
The increase in the number of employed persons and employees, starting in 2013 and continuing until 2015, fails to compensate for the decline in the number of employees in the division in 2012. The change of the two indicators is in line with the changes that occur in the value of the production, and their decline in 2012 is greater than that in the production.

Figure 1.71. Net sales revenue (BGN thousand) in the Manufacture of Paper and Paper Products division



Net sales revenue follows the rate of change of the production in the Manufacture of paper and paper products division. The dynamics of the profit is similar and there the changes in the values are bigger.

Figure 1.72. Profit (BGN thousand) in the Manufacture of Paper and Paper Products division



The change in the profit of the division follows the change in the above-mentioned economic indicators, with the observed decline going on from 2010 to 2013. Only then the profit begins to increase. Loss in the division increases from 2008 to 2011, from BGN 2.8 million at the beginning of the period to BGN 3.5 million at the end. It then declines, and in 2014 it reaches its 2008 level. In 2015, there is a slight increase.

Figure 1.73. Loss (BGN thousand) in the Manufacture of Paper and Paper Products division

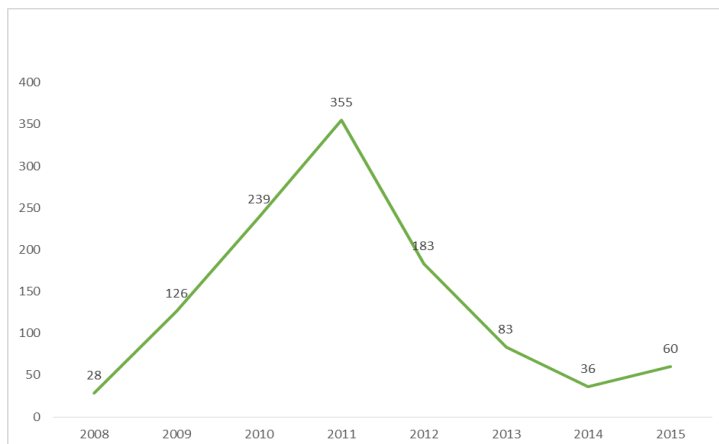
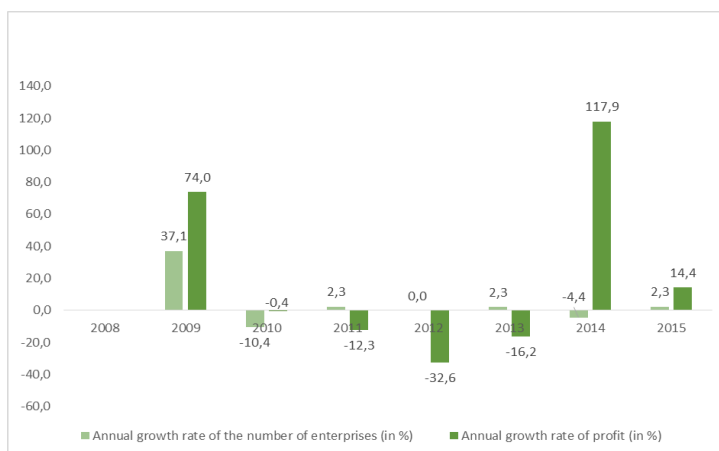


Figure 1.74. Annual growth rate of the number of enterprises and profit (in %) in the Manufacture of Paper and Paper Products division



Profit varies considerably more than the growth rate in the number of enterprises and the growth rate of production in the division under consideration. Profit has the biggest increase on an annual basis in 2014 - 117.9%.

Figure 1.75. Annual growth rate of production and profit (in %) in the Manufacture of Paper and Paper Products division

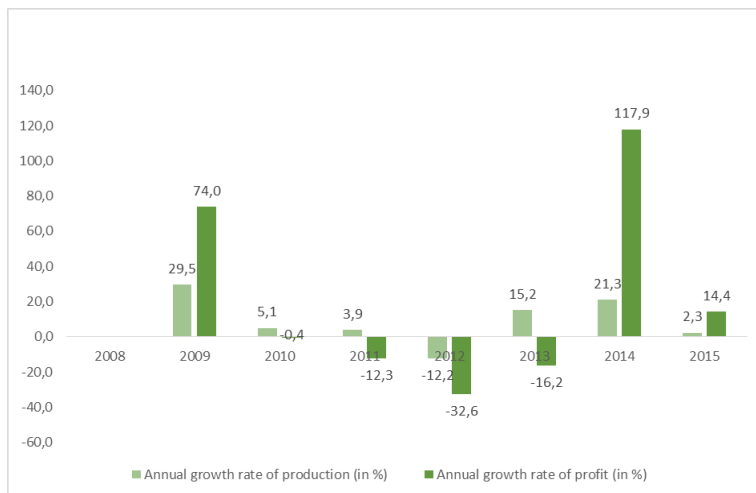
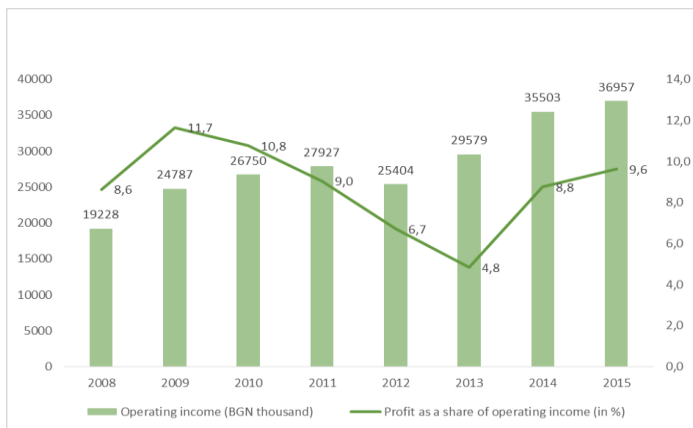


Figure 1.76. Net sales revenue and profit (BGN thousand) in the Manufacture of Paper and Paper Products division



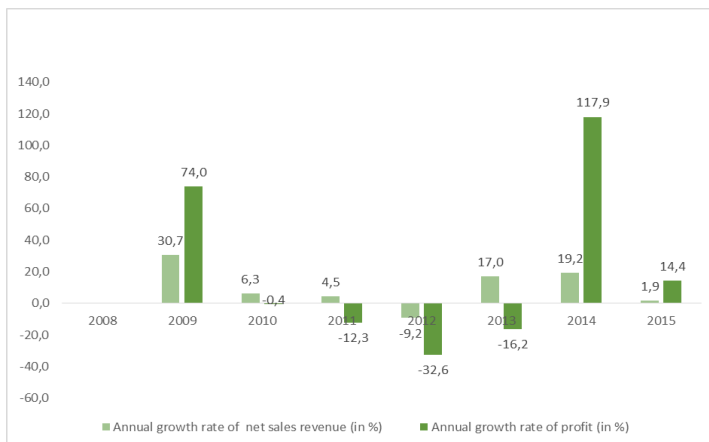
Despite the sharp decline in profits in the paper division in Blagoevgrad and Kyustendil, net sales revenue retains the same values during the observed period and remains stable in 2013, when profits decrease significantly.

Figure 1.77. Operating income and profit as a share of operating income (BGN thousand) in the Manufacture of Paper and Paper Products division



During the period under review, operating income in the paper division grows gradually and nearly doubles its starting value at the end of the period. The share of the profit from operating income is the highest in 2009 - 11.7%, and in 2013 it reaches its minimum of 4.8% of operating income.

Figure 1.78. Annual growth rate of net sales revenue and profit in % in the Manufacture of Paper and Paper Products division



Both positive and negative changes in the profit of the division are higher than the changes in net sales revenue on an annual basis.

Figure 1.79. Turnover (BGN thousand) in the Manufacture of Paper and Paper Products division

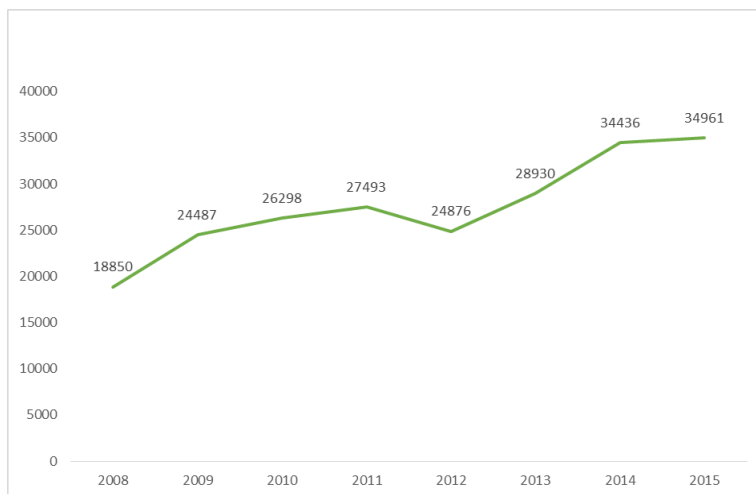


Figure 1.80. Annual growth rate of net sales revenue and turnover in % in the Manufacture of Paper and Paper Products division



Net sales revenue and turnover in the paper division change identically on an annual basis. The turnover of enterprises in the division, as well as net sales revenue, are changing their values according to the production.

Figure 1.81. Net sales revenue and turnover (BGN thousand) in the Manufacture of Paper and Paper Products division

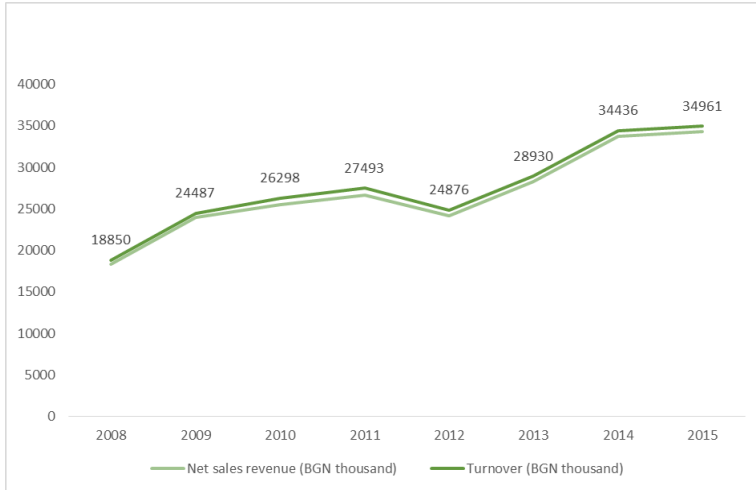
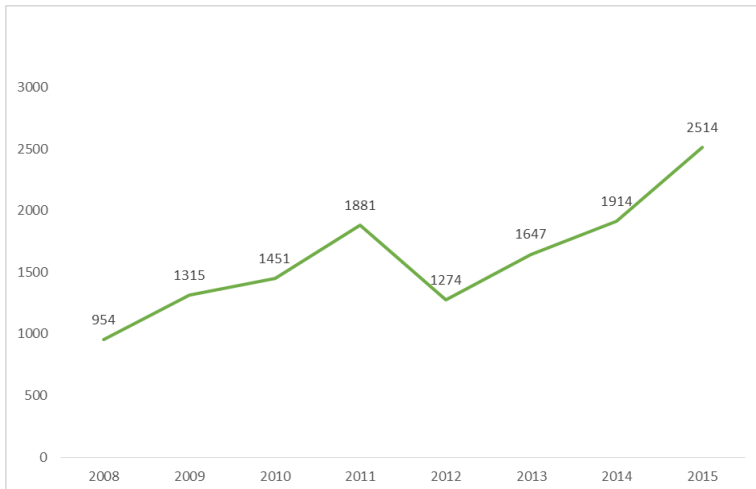
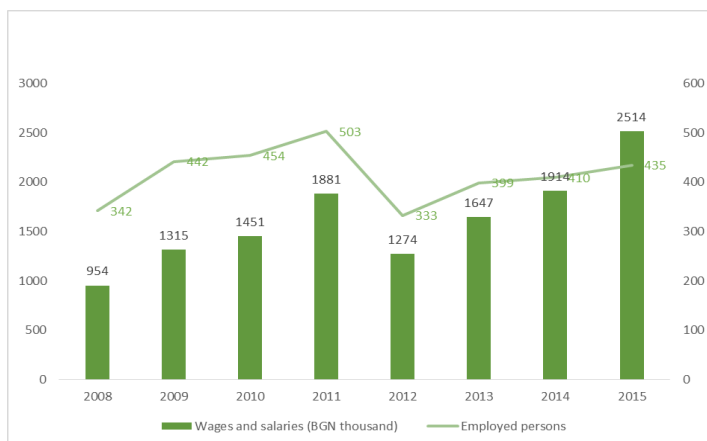


Figure 1.82. Wages and salaries (BGN thousand) in the Manufacture of Paper and Paper Products division



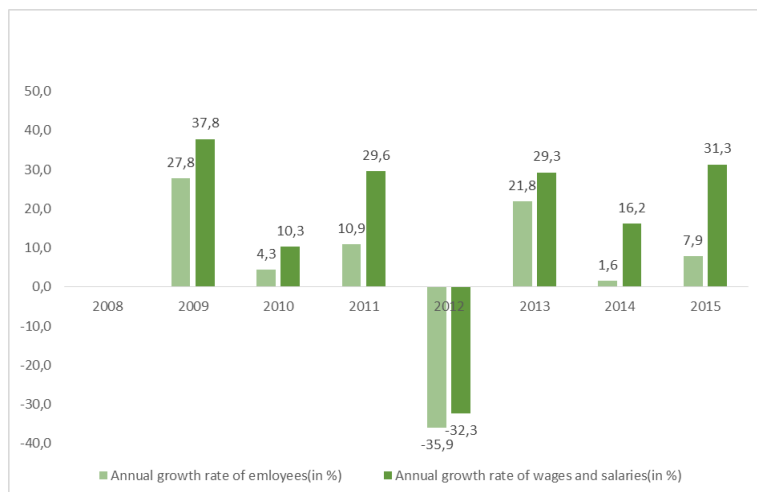
Wages and salaries in the division are gradually increasing and their values double by the end of the period. In 2012, there is a decline in wages and salaries that is overcome in 2014.

Figure 1.83. Wages and salaries (BGN thousand) and employed persons in the Manufacture of Paper and Paper Products division



Wages and salaries follow the dynamics of employed persons in the paper division. Here, again, a steady rise may be observed, interrupted by a fall in 2012.

Figure 1.84. Annual growth rate of employed persons and wages and salaries in % in the Manufacture of Paper and Paper Products division



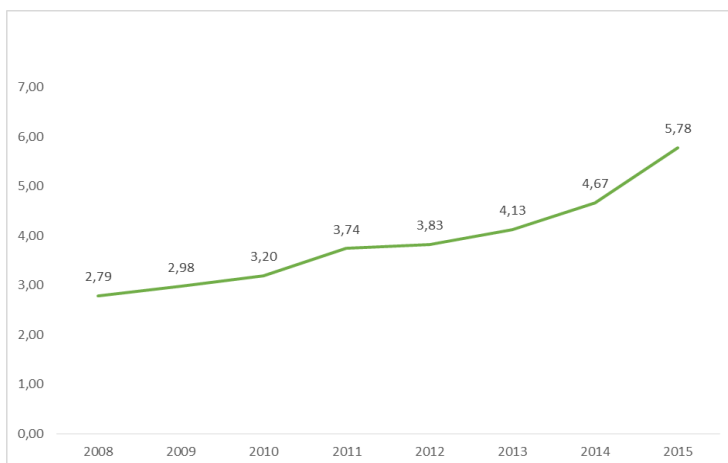
Wages and salaries have a greater variation compared to the annual growth rate of employees during the period that is considered. An exception is 2012, when the changes of the two indicators are very close - the number of employees decreases by -35.9% on an annual basis and the remuneration - by -32.3%.

Figure 1.85. Annual growth rate of operating expenses and wages and salaries in % in the Manufacture of Paper and Paper Products division



Over the observed period, wages and salaries increase more than operating expenses (and in 2012 they are significantly lower than operating expenses).

Figure 1.86. Average wages and salaries per employed person in an enterprise (BGN thousand) in the Manufacture of Paper and Paper Products division



The average annual wages and salaries per employee in an enterprise in the paper division in the Blagoevgrad and Kyustendil regions are gradually increasing. At the end of the period, companies in the sector spend twice more than they did at the beginning to reward the work of their employees.

Manufacture of furniture

The division Manufacture of furniture includes the classes

31.01 Manufacture of office and shop furniture

31.02 Manufacture of kitchen furniture

31.03 Manufacture of mattresses

31.09 Manufacture of other furniture

According to NACE Rev. 2.

The number of enterprises in the manufacture of furniture division in the regions of Kyustendil and Blagoevgrad is increasing for the period 2008 - 2010 (from 150 firms in the division to 166), then this number decreased to 143 companies in 2012. From 2013 to 2015 there is a rise in the number of businesses in the division, again reaching the values of 2010 (168 companies in 2015).

Figure 1.87. Number of enterprises in the Manufacture of Furniture division

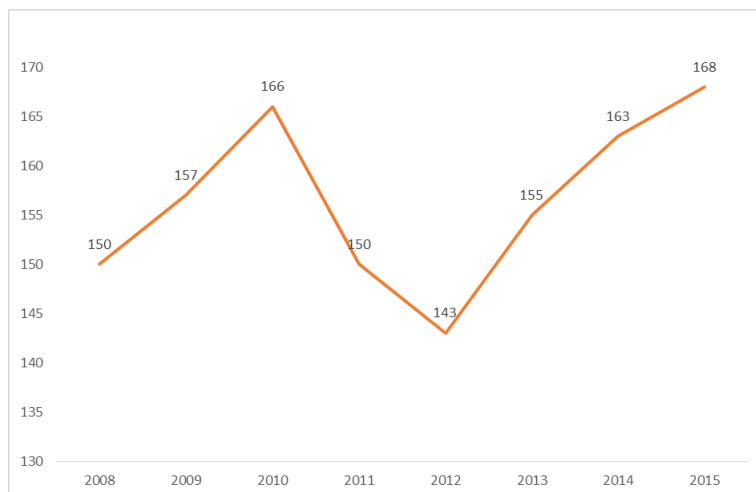


Figure 1.88. Annual growth rate of the number of enterprises and the production in % in the Manufacture of Furniture division



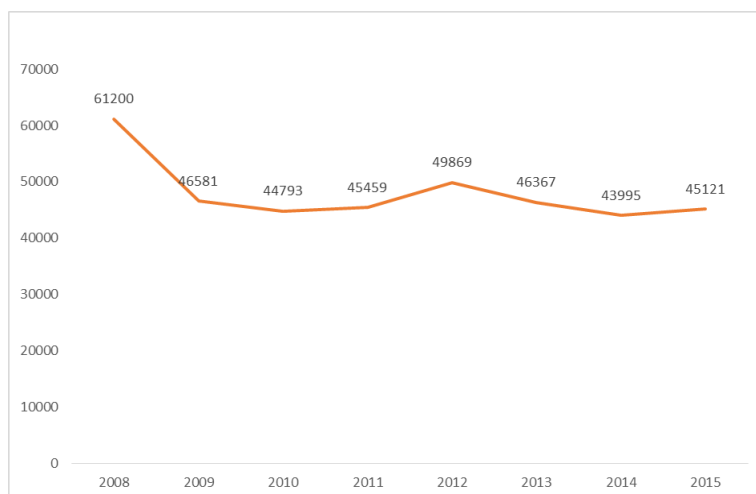
The annual changes in the number of enterprises operating in the manufacture of furniture division and their production are opposite during the period that is considered. An exception is the year 2015 when the indicators move together. In 2009 and 2010, as well as in 2013 and 2014, despite the growing number of enterprises in the division, there is a decline in the value of production. In 2011 and 2012, the trend is reversed - the production is on the rise and the number of enterprises decreases.

Figure 1.89. Annual growth rate of the number of enterprises and the employees in % in the Manufacture of Furniture division



The growth rate of the employees in the manufacture of furniture division in the regions of Blagoevgrad and Kyustendil remains negative from 2008 to 2015. In 2012, the negative change in the number of employees in the division is the smallest for the observed period and then the annual growth rate of the value of production is the biggest - 9.7%. Despite the increase in the number of enterprises, the annual percentage changes in the number of employees continue to be negative. In 2011 and 2012, both the number of companies in the division and the number of employees decrease on an annual basis. Over the rest of the period that is considered, the number of enterprises in the manufacture of furniture division is increasing and the change in the number of employees remains negative.

Figure 1.90. Production (BGN thousand) in the Manufacture of Furniture division



Despite the observed dynamics in the number of enterprises during the period, the values of production remain relatively constant. The number of companies producing furniture increases until the end of the period, while production decreases (from a production of BGN 61 million at the beginning of the period to BGN 45 million at the end).

Figure 1.91. Production (BGN thousand) and number of enterprises in the Manufacture of Furniture division

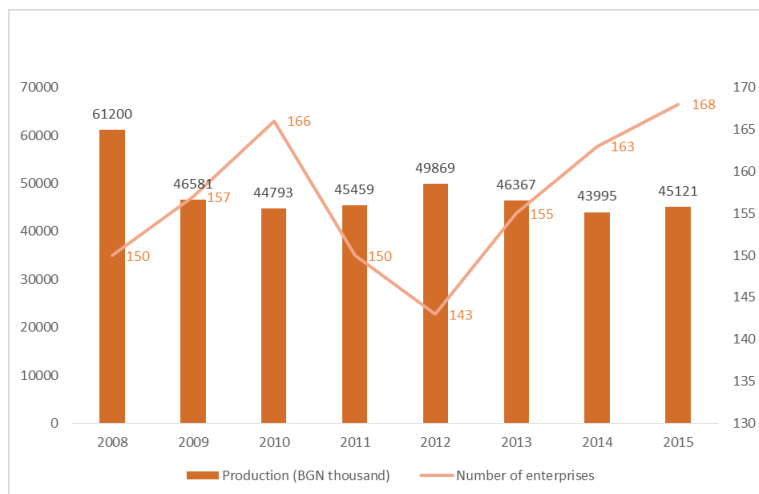


Figure 1.92. Annual growth rate of production and employees (in %) in the Manufacture of Furniture division



The annual growth in production of the manufacture of furniture division as well as that of employees remained negative during most of the years in the period.

Figure 1.93. Annual growth rate of production and operating income (in %) in the Manufacture of Furniture division



The dynamics of the operating income follows the annual changes in production over most of the period. During some of the years, the changes in the two indicators are the opposite. Operating income in 2011 and 2015 decline, despite production growth, and in 2014 operating income increases, despite the diminishing production in the same year. Turnover changes follow those in production and both indicators increase by almost identical percentages over the period.

Figure 1.94. Annual growth rate of production and turnover (in %) in the Manufacture of Furniture division

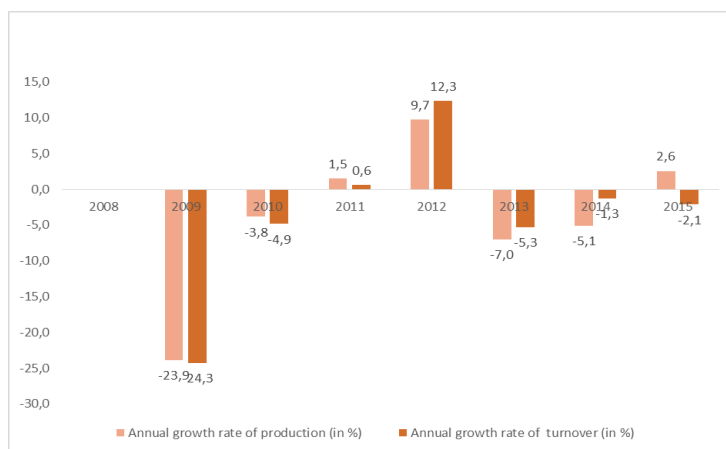
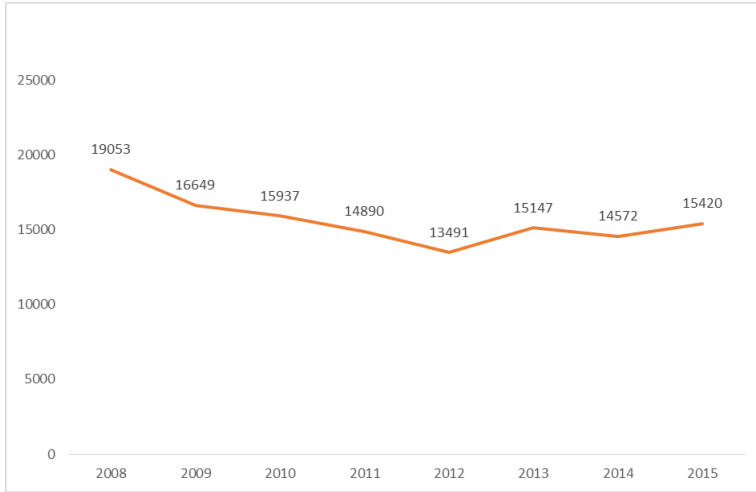


Figure 1.95. Value added at factor costs (BGN thousand) in the Manufacture of Furniture division



The changes in the value added at factor costs, operating income and expenses, wages and salaries, net sales revenue and turnover follow the dynamics of the production in the division.

Figure 1.96. Operating income and expenses (BGN thousand) in the Manufacture of Furniture division

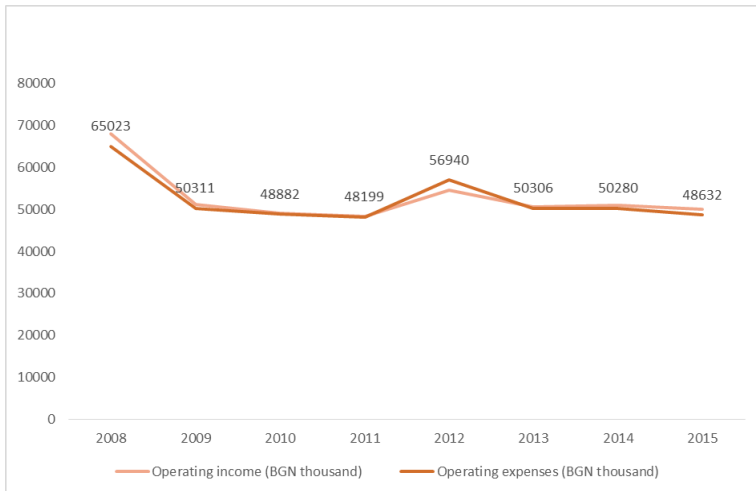
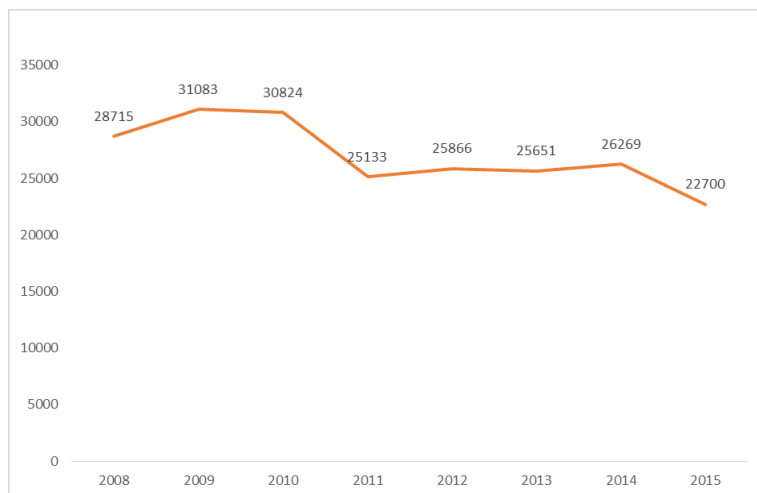
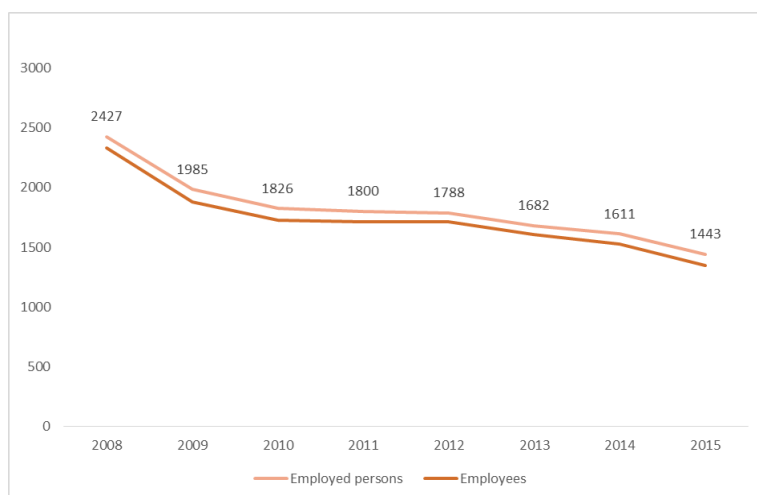


Figure 1.97. Fixed tangible assets (BGN thousand) in the Manufacture of Furniture division



Fixed tangible assets of the enterprises in the division increased in 2009 and retained the same levels in 2010, and then declined in 2011. The figures for 2011 remain roughly unchanged until 2014, and in 2015 there is a decrease.

Figure 1.98. Employed persons and employees in the Manufacture of Furniture division



The number of employees in the division falls down by almost double from 2332 in 2008 to 1349 in 2015. The trend of changes in employed persons and employees is similar to that of the value of production.

Figure 1.99. Net sales revenue (BGN thousand) in the Manufacture of Furniture division

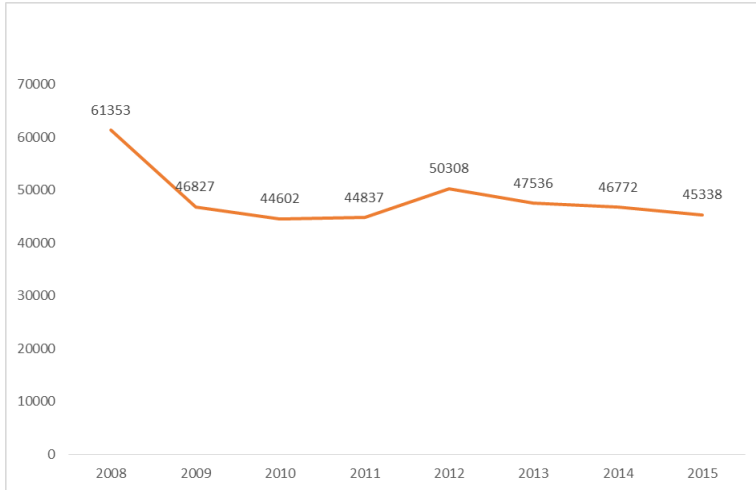
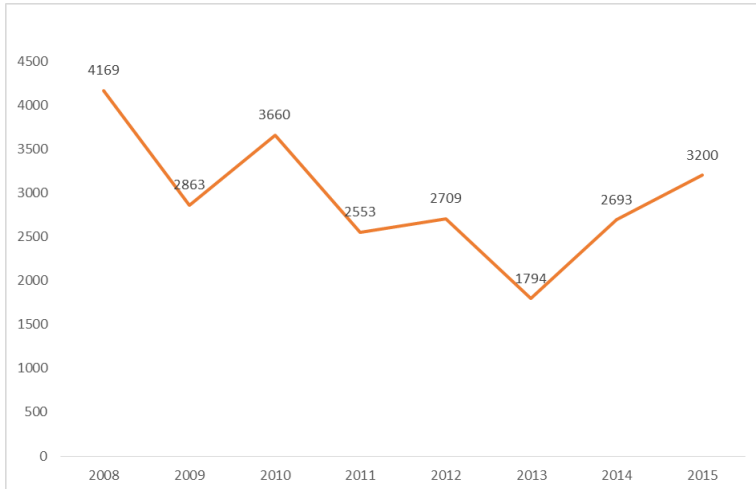
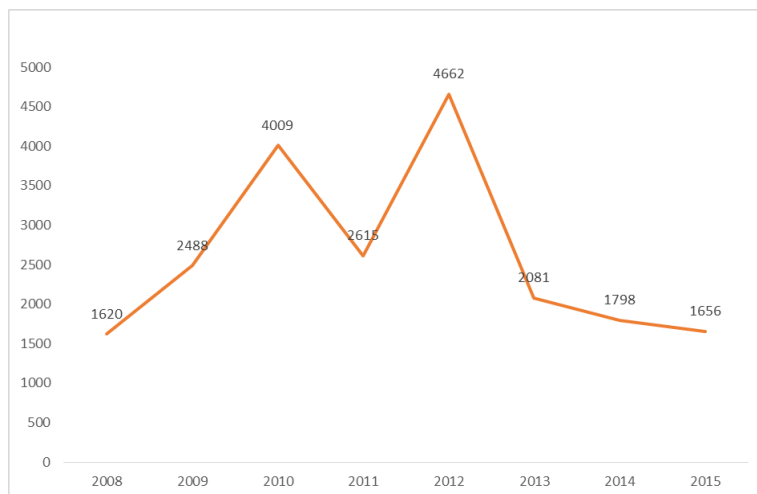


Figure 1.100. Profit (BGN thousand) in the Manufacture of Furniture division



Profit in the division changes dynamically, with alternating decreases and increases for the period 2008-2013. The highest value is observed at the beginning of the period – BGN 4.1 million and the lowest is reached in 2013 – BGN 1.7 million. In 2014 and 2015 the profit in the division increases. The loss in the division is on the rise from 2008 to 2010, and from 2011 to 2013 there are alternating periods of decline and increase. At the end of the period under review, in 2014 and 2015, the loss in the division fell down to reach its 2008 levels.

Figure 1.101. Loss (BGN thousand) in the Manufacture of Furniture division



Possible reasons for the change in profit in the manufacture of furniture division in Blagoevgrad and Kyustendil are the rise in the number of companies and also the increase in production (and sales). The changes in profit are significantly higher compared to the annual growth rate of the number of enterprises over the whole period. The highest growth rate of the profit in the division was observed in 2014 (50.1%). The annual growth rate in the number of firms has had relatively close values throughout the period that is considered. Changes in the production on an annual basis are lower than those occurring in the profits in the manufacture of furniture division in Blagoevgrad and Kyustendil.

Figure 1.102. Annual growth rate of the number of enterprises and profit (in %) in the Manufacture of Furniture division

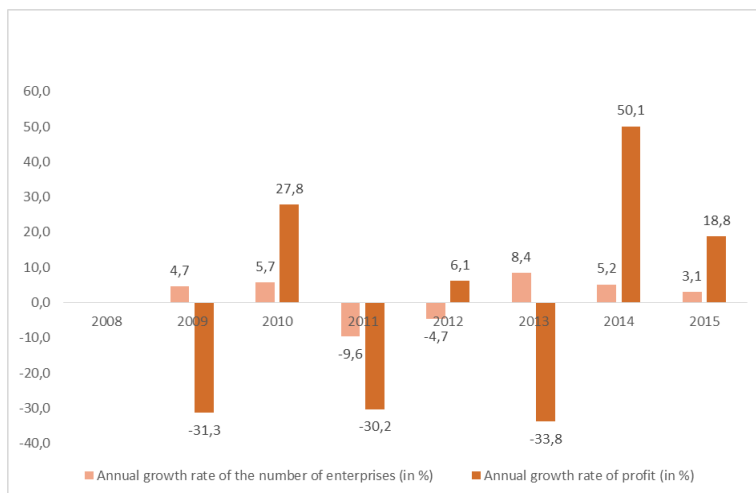


Figure 1.103. Annual growth rate of production and profit (in %) in the Manufacture of Furniture division

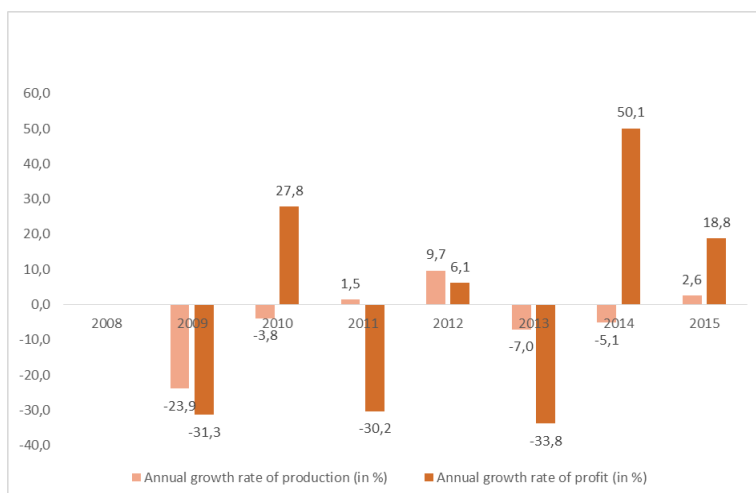
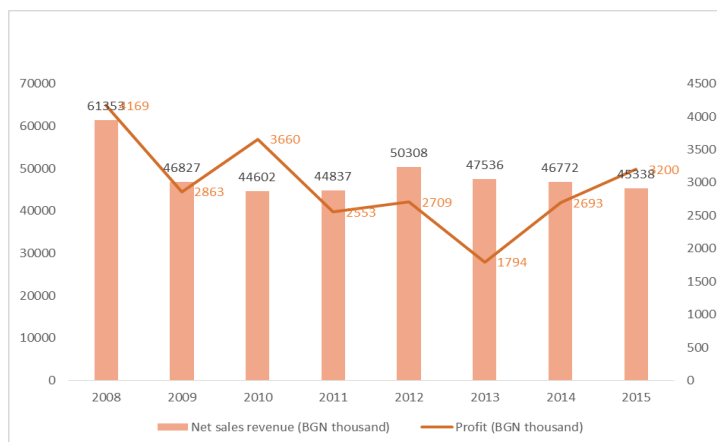


Figure 1.104. Net sales revenue and profit (BGN thousand) in the Manufacture of Furniture division



The dynamics of the changes in net sales revenue is similar to that of the profit in the division. The movement of the operating income is analogical. The highest value of the profit as a share of operating income reached in 2010 – 7.4%. The manufacture of furniture division generates the greatest operating income in 2008, amounting to BGN 67 million. By the end of the period, the operating income remains relatively unchanged, with a value of roughly BGN 50 million.

Figure 1.105. Operating income and profit as a share of operating income (BGN thousand) in the Manufacture of Furniture division

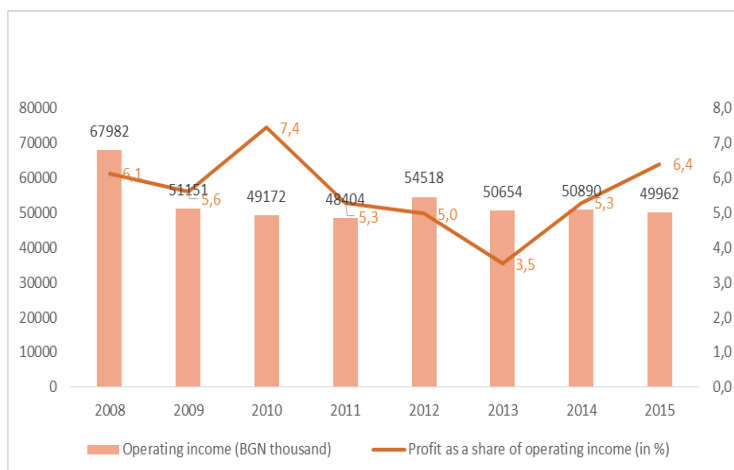
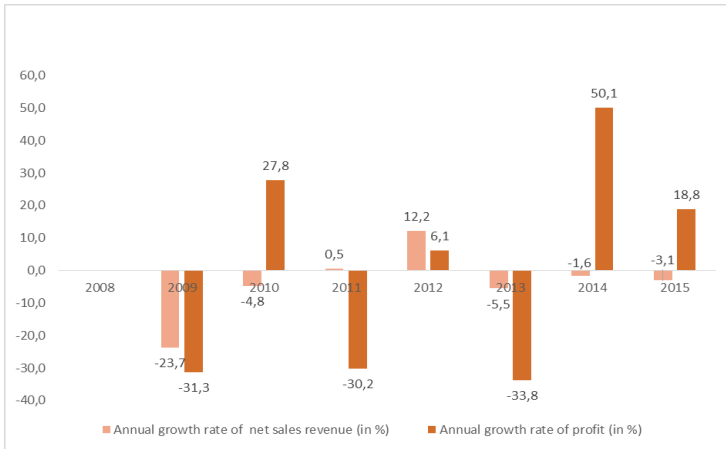


Figure 1.106. Annual growth rate of net sales revenue and profit in % in the Manufacture of Furniture division



In 2011 and 2012, the annual change in net sales revenue is positive, and it declines over the rest of the period under review. Despite the negative values of the change in net sales revenue, profit in the sector increases significantly in 2010, 2014 and 2015. The annual growth rate of profit reaches its highest value in 2014 - 50.1 percentage points.

Figure 1.107. Turnover (BGN thousand) in the Manufacture of Furniture division

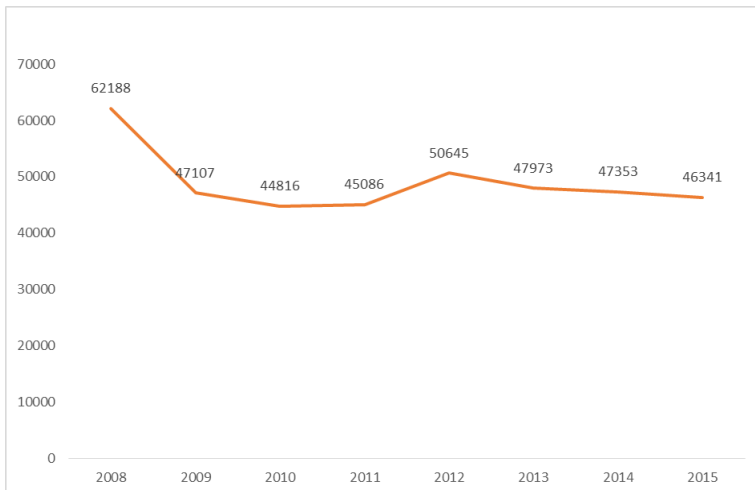
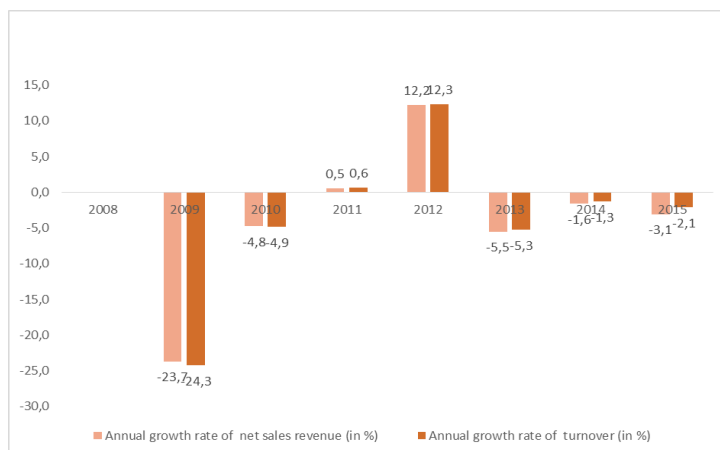


Figure 1.108. Annual growth rate of net sales revenue and turnover in % in the Manufacture of Furniture division



Changes in the net sales revenue and turnover on an annual basis are almost identical. There is a large decline in 2009, followed by a gradual stabilization and growth in 2012. By the end of the period, the two indicators recorded a negative growth rate, which coincided with the decrease in production.

Figure 1.109. Net sales revenue and turnover (BGN thousand) in the Manufacture of Furniture division

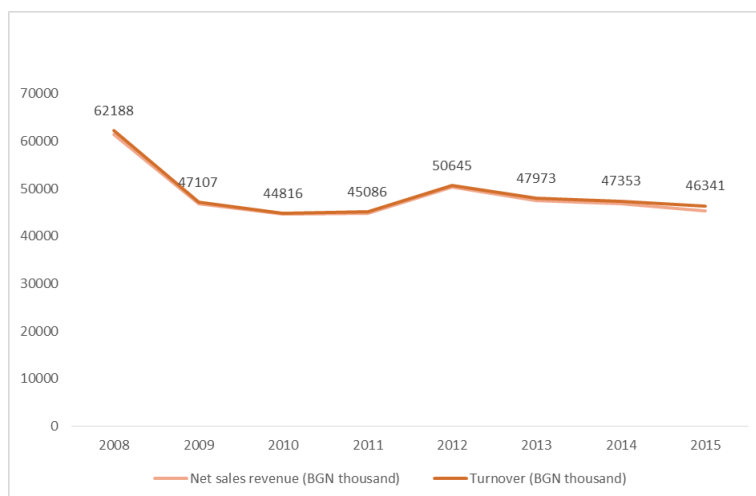
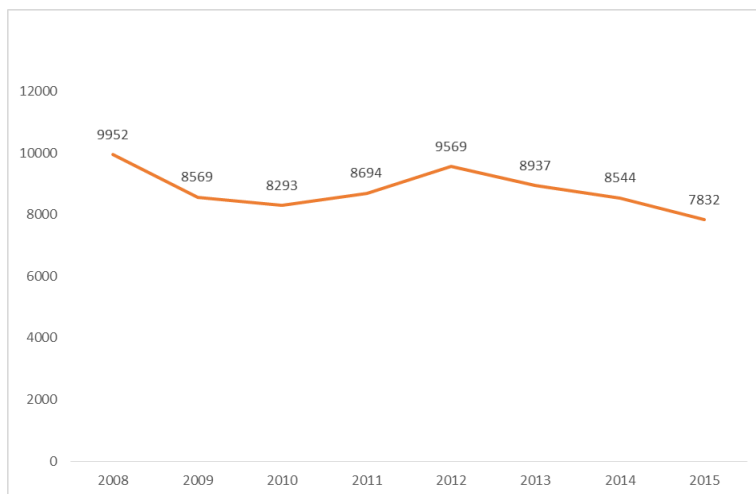
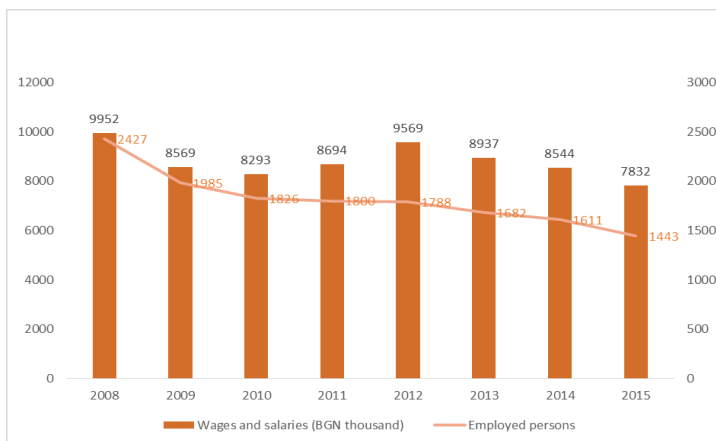


Figure 1.110. Wages and salaries (BGN thousand) in the Manufacture of Furniture division



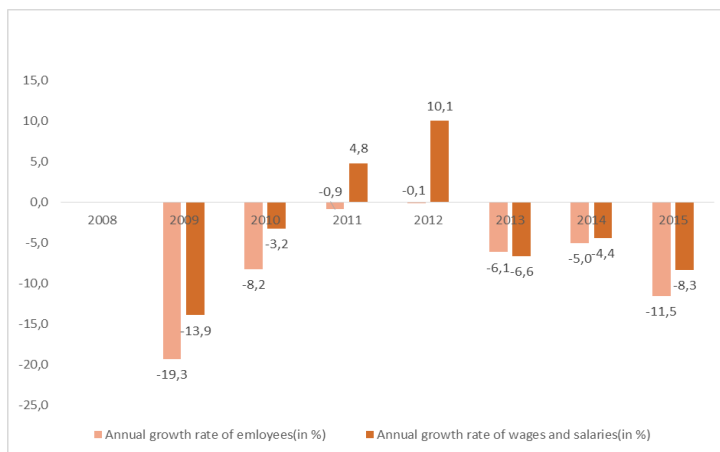
As mentioned above, the dynamics of the net sales revenue and turnover, as well as that of the wages and salaries, is similar. The figures in 2008 are the highest, and then a gradual decrease is noted. In 2012 there is a slight upswing, but this is again followed by a drop.

Figure 1.111. Wages and salaries (BGN thousand) and employed persons in the Manufacture of Furniture division



The number of employees in the division fall by almost double the amount from the beginning of the period. Wages and salaries also decline as well.

Figure 1.112. Annual growth rate of employed persons and wages and salaries in % in the Manufacture of Furniture division



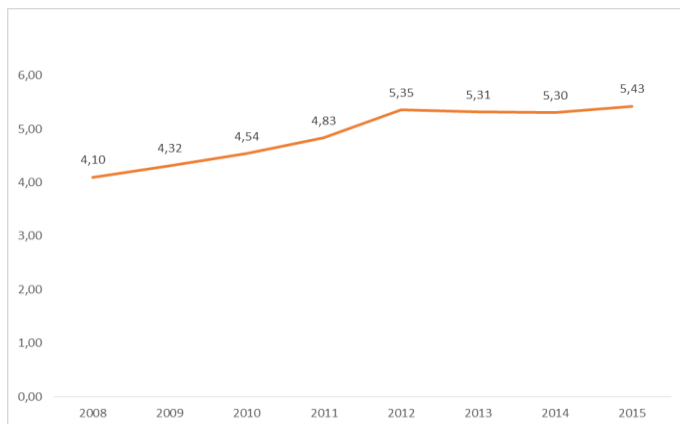
The only observed positive changes in the wages and salaries are those from 2011 and 2012. Throughout the period that is considered, the number of employees and the wages and salaries are negative. This may be related to the declining levels of production.

Figure 1.113. Annual growth rate of operating expenses and wages and salaries in % in the Manufacture of Furniture division



The operating expenses and the wages and salaries of the furniture division in Blagoevgrad and Kyustendil tend to change in a similar way over the period under review. The two indicators increase the most in 2012. During the rest of the period, their growth is negative.

Figure 1.114. Average wages and salaries per employed person in an enterprise (BGN thousand) in the Manufacture of Furniture division



The number of employees in the furniture sector and the wages and salaries decrease over the observed period. However, the average annual wages and salaries per employee in an enterprise increase from 4,100 to 5,430 BGN.

Wholesale and retail of Furniture

For the purposes of the current analysis, the following classes will be grouped together:

46.13 Agents involved in the sale of timber and building materials

46.15 Agents involved in the sale of furniture, household goods, hardware and ironmongery

46.47 Wholesale of furniture, carpets and lighting equipment

46.65 Wholesale of office furniture

*46.73 Wholesale of wood, construction materials and sanitary equipment
and*

47.59 Retail sale of furniture, lighting equipment and other household articles in specialised stores

The number of companies operating in the abovementioned classes in the regions of Blagoevgrad and Kyustendil increase steadily over the period that is considered, from 280 in 2008 to 391 in 2014 and to 379 in 2015.

Figure 1.115. Number of enterprises in the Wholesale and Retail of Furniture and Other division

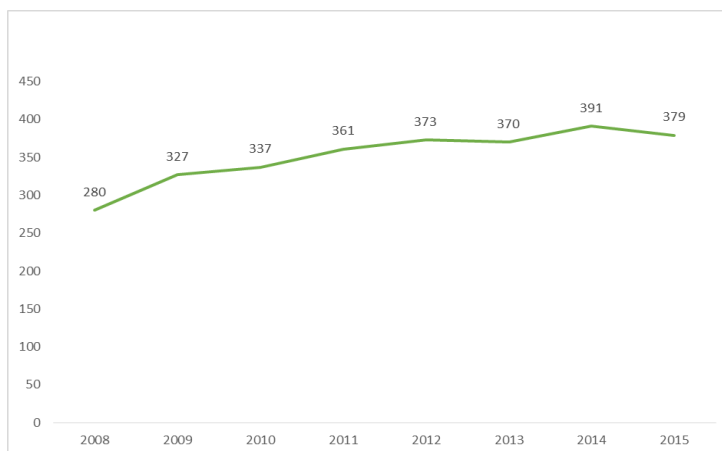
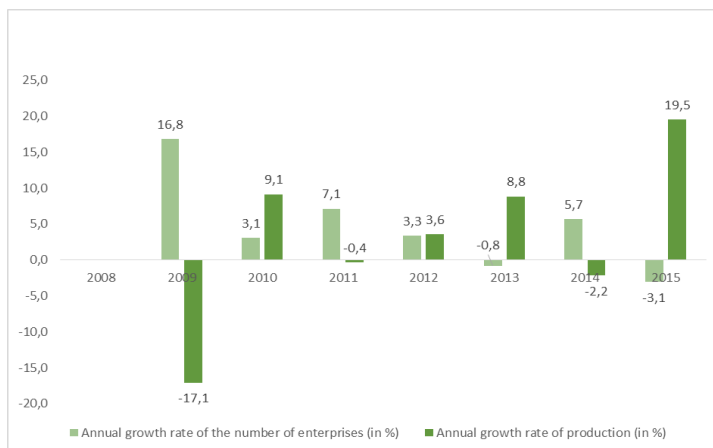


Figure 1.116. Annual growth rate of the number of enterprises and the production in % Wholesale and Retail of Furniture and Other division



The annual growth in the number of enterprises and production in 2009 is the opposite. Then, the number of companies operating in the trade-related classes increases, and production, contrary to expectations, changes in a negative direction. In 2010, the opposite trend is observed – the annual percentage change in production is higher than that of the number of companies operating in trade-related classes. Until the end of the period under review, only in 2012 the movements of both of the indicators are in the same direction (increase), while in the rest of the time there is an increase in the number of enterprises and negative values of the changes in the production or vice versa.

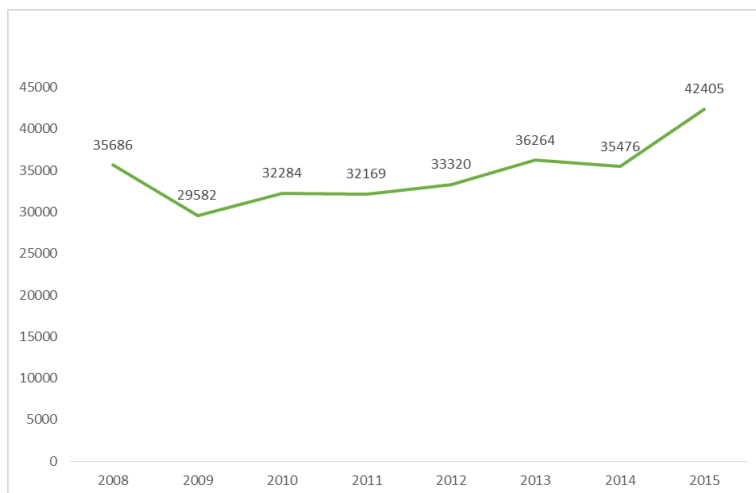
Figure 1.117. Annual growth rate of the number of enterprises and the employees in % in the Wholesale and Retail of Furniture and Other division



The percentage change in the number of enterprises in the wholesale and retail of furniture division is positive almost throughout the whole reviewed period. Employees, however, recorded both positive and negative growth. In 2013, there is a significant drop in the number of employees in the division in the regions of Blagoevgrad and Kyustendil. The largest annual change in the number of firms in the classes related to trade was reported in 2009 – 16.8%. Then the number of employees increased by 2.5 percentage points compared to 2008. In 2010 and 2012, despite the annual growth of the number of enterprises, the number of employees registered a negative change on an annual basis and decreased by 11.2%.

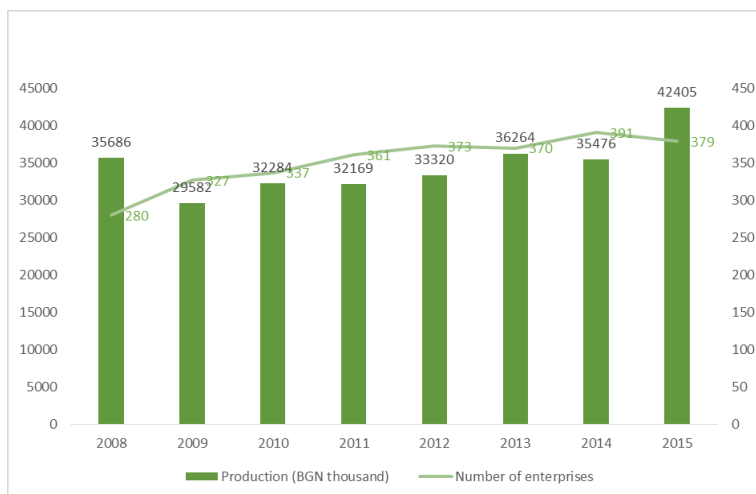
Despite the increase in the number of enterprises compared to the previous year, the annual growth rate for employees is lower and in 2010 and 2013 the values are negative.

Figure 1.118. Production (BGN thousand) in the Wholesale and Retail of Furniture and Other division



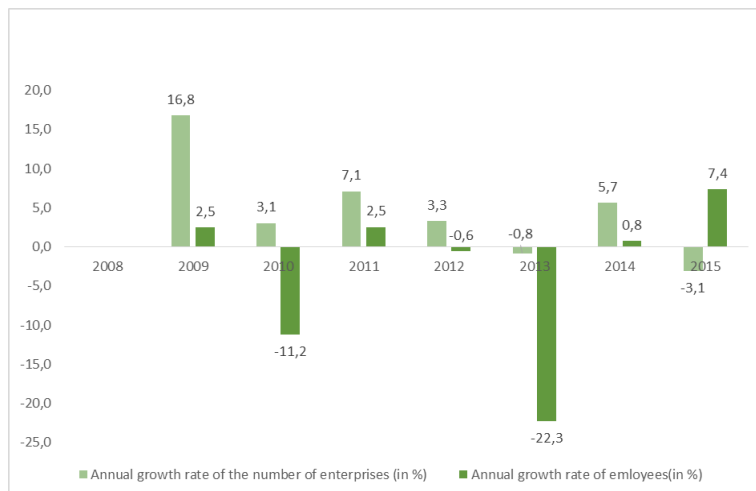
The production in the observed classes declines in 2009, and then its value increases until the end of the period. A slight decline was registered in 2014, which is offset by the 2015 growth.

Figure 1.119. Production (BGN thousand) and number of enterprises in the Wholesale and Retail of Furniture and Other division



The dynamics of the number of enterprises and production over the period is similar. Highest productivity is observed at the beginning and the end of the period - then the values of production in the division are the highest. Since the decline in production in 2009, there has been a steady increase until the end of the period.

Figure 1.120. Annual growth rate of production and employees (in %) in the Wholesale and Retail of Furniture and Other division



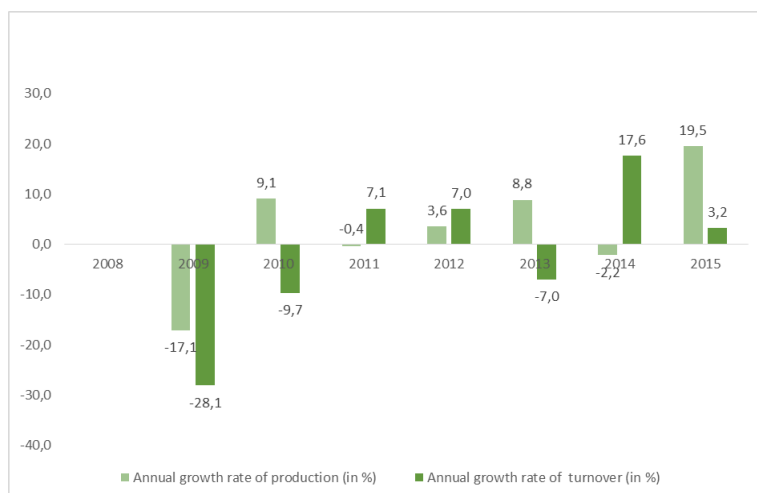
The increase in output can be due to an increase in employee productivity or an increase personnel. In the division of wholesale and retail of furniture in the regions of Blagoevgrad and Kyustendil there are opposite movements of the growth rates of the production and employees. This means that production is rising and that the number of employees decreases or vice versa. In the years when staff are on the rise and production is declining, it is possible that there is a drop in workers' productivity.

For most of the years in the observed period, the annual growth rates of the operating income and production are in the opposite direction. In some of the years, more is produced and the operating income decreases and in others the production is declining and the operating income increases.

Figure 1.121. Annual growth rate of production and operating income (in %) in the Wholesale and Retail of Furniture and Other division

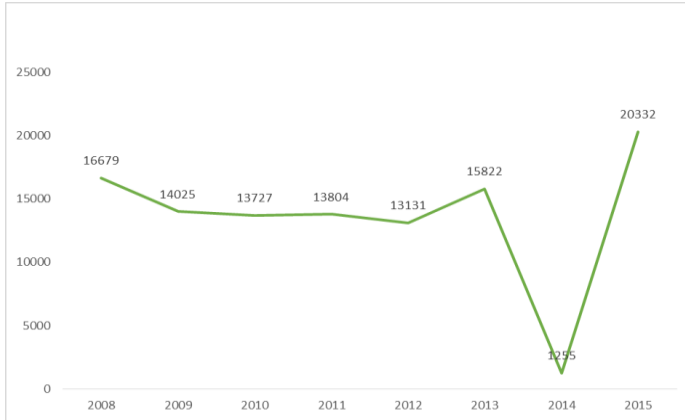


Figure 1.122. Annual growth rate of production and turnover (in %) in the Wholesale and Retail of Furniture and Other division



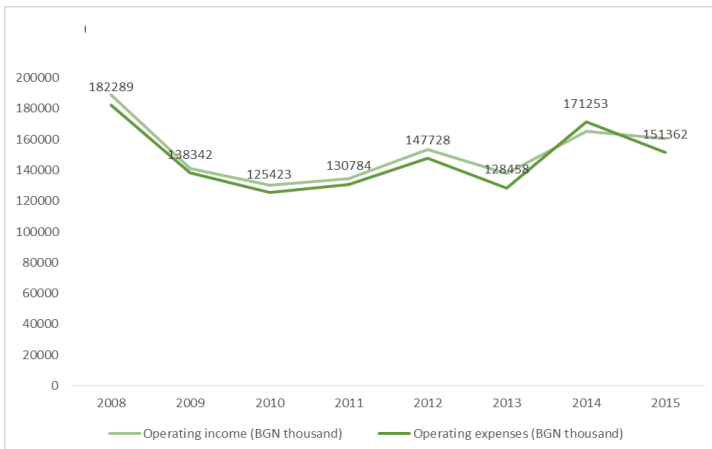
Unlike the abovementioned division, where usually the production and turnover change with almost identical patterns, here the annual growth rate of those indicators differs.

Figure 1.123. Value added at factor costs (BGN thousand) in the Wholesale and Retail of Furniture and Other division



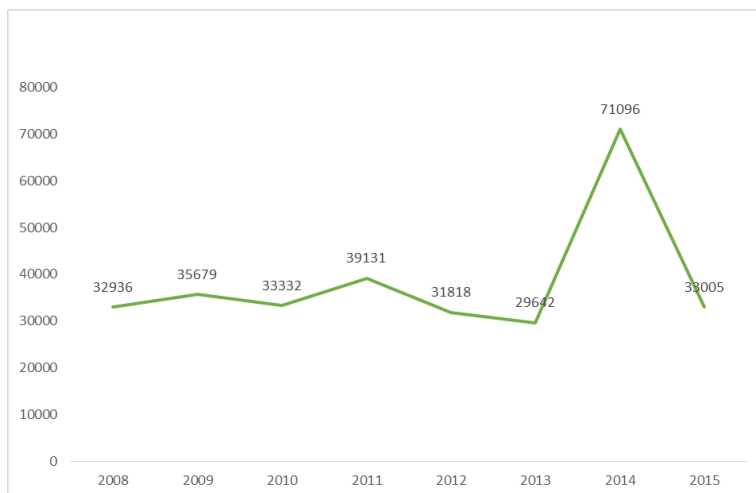
Value added at factor cost has been slightly declining since 2008. There is a sharp drop in the value added in 2014, which is offset next year. In 2015, the added value at factor costs in the division is the greatest.

Figure 1.124. Operating income and expenses (BGN thousand) in the Wholesale and Retail of Furniture and Other division



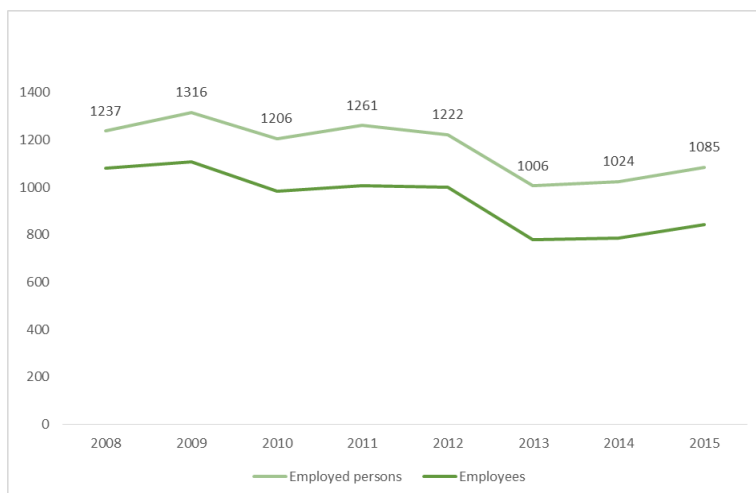
Operating income and expenses of the enterprises in the examined classes decrease at the beginning of the period and reach their lowest value in 2010. Then, by 2012, both indicators grow, followed by alternating fall and rise by 2015.

Figure 1.125. Fixed tangible assets (BGN thousand) in the Wholesale and Retail of Furniture and Other division



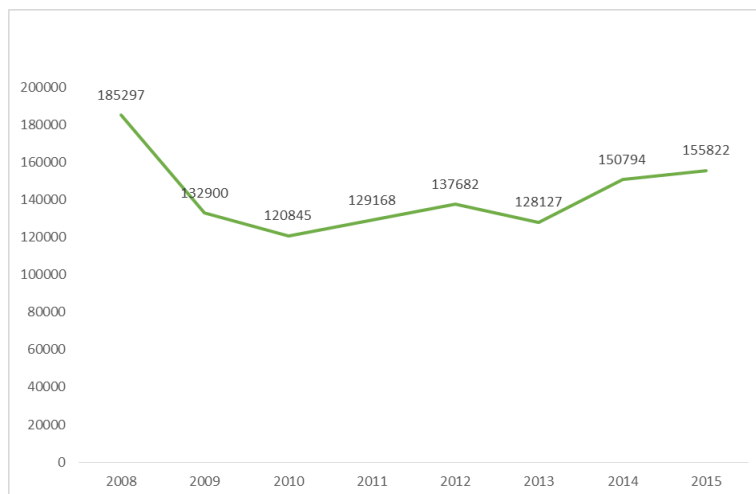
The values of fixed tangible assets in the monitored division remain relatively close from 2008 to 2013, and in 2014 there is a sharp, more than double, increase. In 2015, the values go back to the levels which were usual for the previous years.

Figure 1.126. Employed persons and employees in the Wholesale and Retail of Furniture and Other division



The change in the number of employed persons and employees in the reviewed classes is characterized by alternating growth and decline periods from 2008 to 2012. In 2013 there is a decrease in the number of people in the classes that are studied, followed by growth in 2014 and 2015. Changes in the wages and salaries in the division are similar and follow the same trends that can be traced within the indicators for the number of employed persons and employees.

Figure 1.127. Net sales revenue (BGN thousand) in the Wholesale and Retail of Furniture and Other division



The net sales revenue as well as the turnover of the companies in the classes in Blagoevgrad and Kyustendil are changing almost identically, with a decrease from 2008 to 2010 followed by an increase in the values until 2015. In 2013 there is a decline in the net sales revenue and the turnover of the firms in the classes related to trade, which is offset by the subsequent growth in 2014 and 2015. At the end of the period, the net sales revenue and turnover of the enterprises in the above mentioned classes were lower than the starting values in 2008.

Enterprise profits follow alternating peaks and declines, with the period beginning with a decrease in value in 2009 and ending with an increase in 2015. From 2011 to 2013, there are two consecutive growth periods. By the end of 2015, the profit in the classes which are examined is higher than at the beginning of the period.

Figure 1.128. Profit (BGN thousand) in the Wholesale and Retail of Furniture and Other division

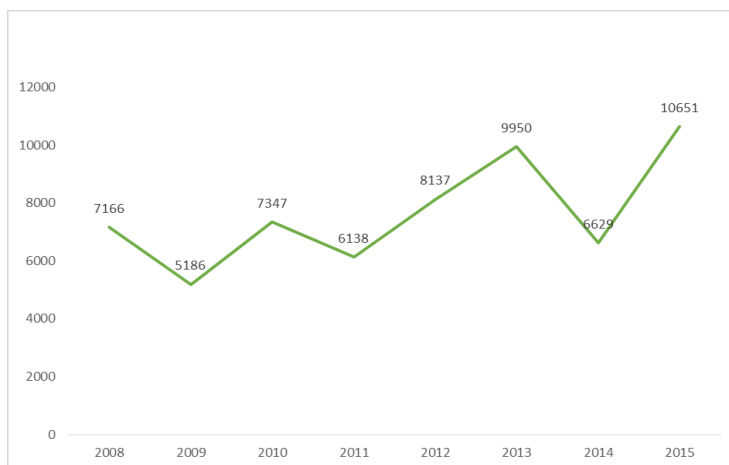
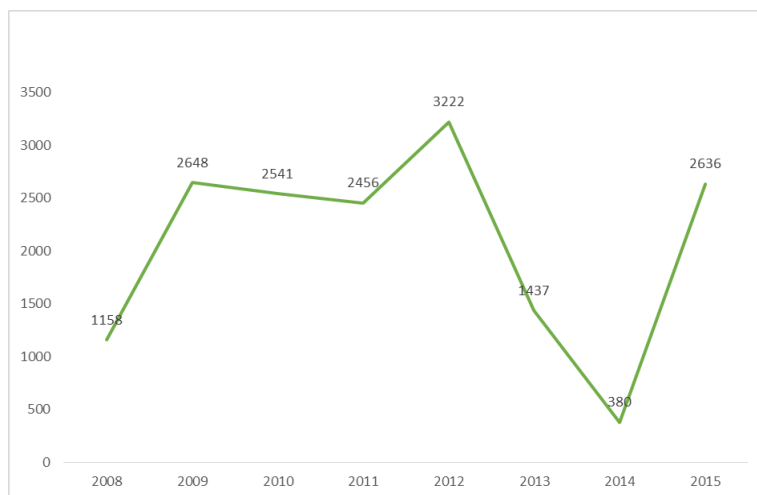
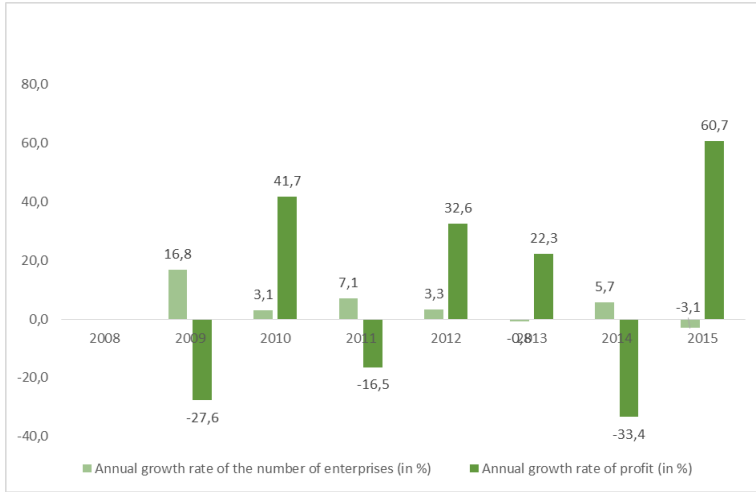


Figure 1.129. Loss (BGN thousand) in the Wholesale and Retail of Furniture and Other division



The loss in the classes under consideration also follows alternating periods of increase and decrease in value that are opposed to changes in profit. In 2009 the loss is growing, from 2012 to 2014 there is a decline, and in 2015 there is an increase, reaching the values from 2011.

Figure 1.130. Annual growth rate of the number of enterprises and profit (in %) in the Wholesale and Retail of Furniture and Other division

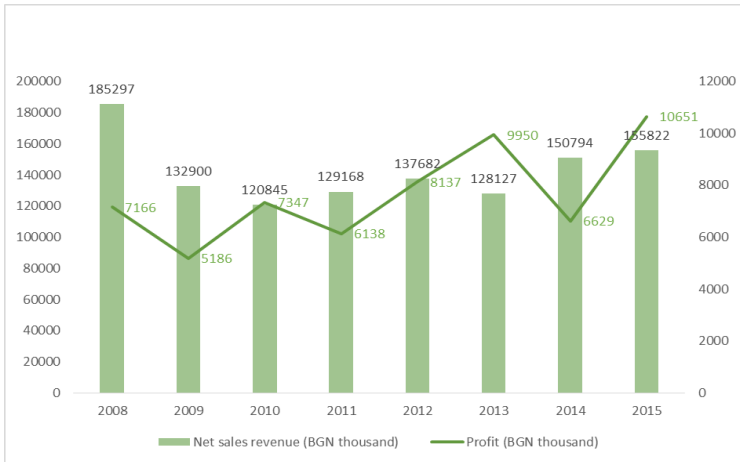


The number of enterprises in the wholesale and retail of furniture division changes with less than growth rate of annual profit. It reaches its highest percentage change on an annual basis in 2015 – it then increased by 60.7% over the previous year. The annual output growth is also less than the profit.

Figure 1.131. Annual growth rate of production and profit (in %) in the Wholesale and Retail of Furniture and Other division

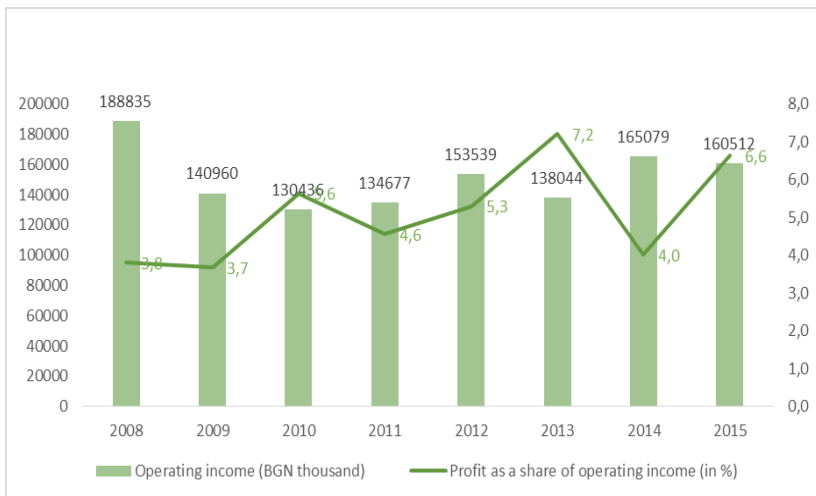


Figure 1.132. Net sales revenue and profit (BGN thousand) in the Wholesale and Retail of Furniture and Other division



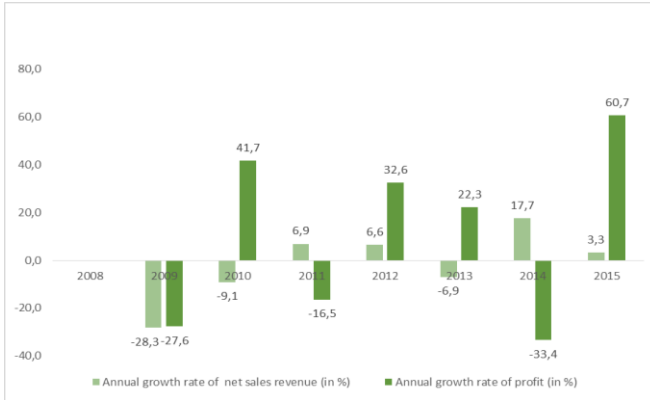
Changes in the net sales revenue and profits in the wholesale and retail of furniture division in the Kyustendil and Blagoevgrad regions are similar, but in some of the years that are reviewed, the alternating peaks and falls of the profit do not correspond to the reduced or increased net sales revenue.

Figure 1.133. Operating income and profit as a share of operating income (BGN thousand) in the Wholesale and Retail of Furniture and Other division



The values of the operating income have been relatively close over the period, with a slight decline following 2008, followed by approximately retaining the same levels and a slight decline in 2013. The 2013 decrease is offset in the coming years. Despite the reduced values of the operating income in 2013, the profit as a share of operating income recorded its highest value - 7.2% of operating income.

Figure 1.134. Annual growth rate of net sales revenue and profit in % in the Wholesale and Retail of Furniture and Other division



Contrary to expectations, the annual growth of net sales revenue and profit in the wholesale and retail of furniture division vary in the opposite direction throughout the period. This means that over the years there have been both higher net sales revenue and less profits, and vice versa.

Figure 1.135. Turnover (BGN thousand) in the Wholesale and Retail of Furniture and Other division



The net sales revenue as well as the turnover of the companies in the studied classes in Blagoevgrad and Kyustendil are changing almost identically, with a decrease from 2008 to 2010 followed by an increase in the values until 2015. In 2013 there is a decrease in net sales revenue and turnover of enterprises in the classes related to trade, which is offset by the subsequent growth in 2014 and 2015. At the end of the period, the net sales revenue and turnover of the firms in the above mentioned classes were lower than the starting values in 2008.

Figure 1.136. Annual growth rate of net sales revenue and turnover in % in the Wholesale and Retail of Furniture and Other division



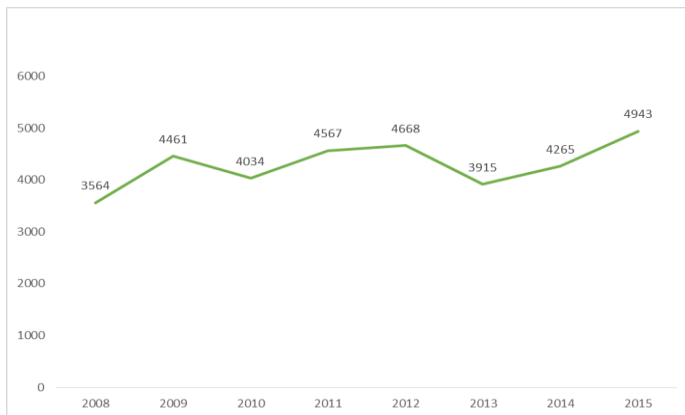
Net sales revenue and turnover in the wholesale and retail of furniture division in the Blagoevgrad and Kyustendil regions continue to grow on an annual basis.

Figure 1.137. Annual growth rate of net sales revenue and turnover in % in the Wholesale and Retail of Furniture and Other division



The dynamics of wages and salaries are similar to that of the net sales revenue and turnover, as well as that of employees.

Figure 1.138. Wages and salaries (BGN thousand) in the Wholesale and Retail of Furniture and Other division



The positive percentage changes in the wages and salaries on an annual basis are greater than the positive changes in the growth rate of employees. The negative annual growth rate of employees is higher than that of the absolute values of wages and salaries - despite a greater negative change in the number of employees, wages and salaries have fallen negatively by less.

Figure 1.139. Wages and salaries (BGN thousand) and employed persons in the Wholesale and Retail of Furniture and Other division

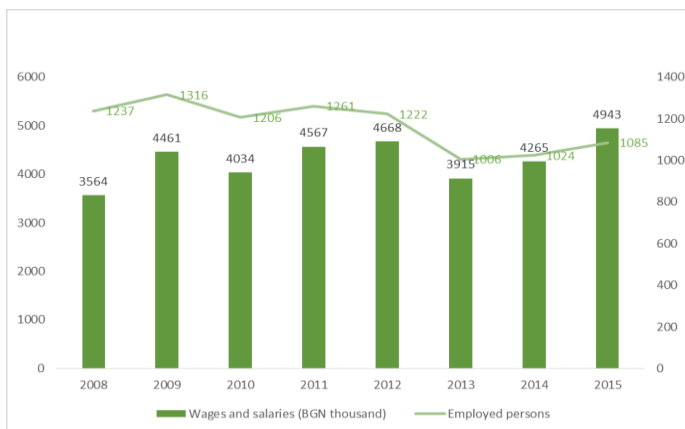


Figure 1.140. Annual growth rate of employed persons and wages and salaries in % in the Wholesale and Retail of Furniture and Other division

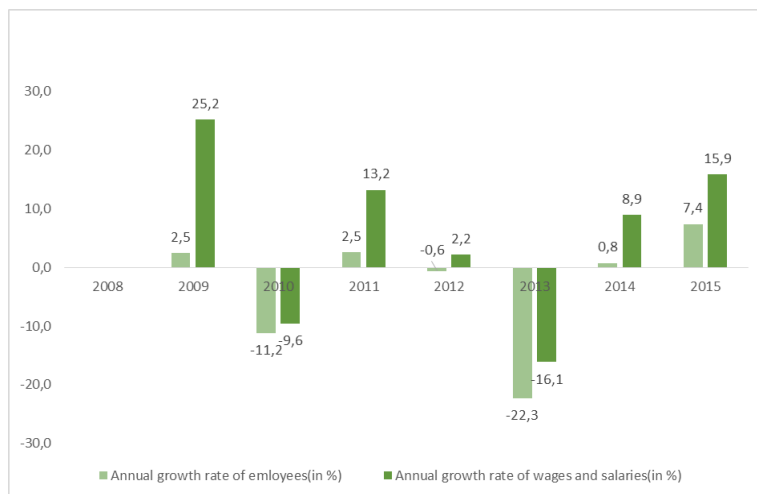


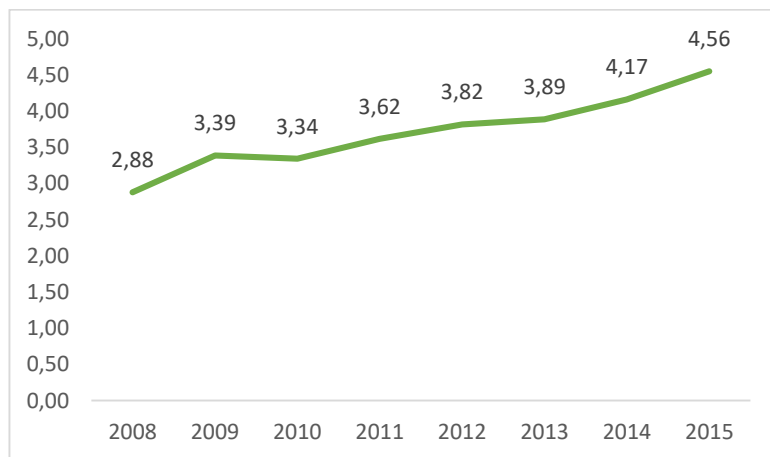
Figure 1.141. Annual growth rate of operating expenses and wages and salaries in % in the Wholesale and Retail of Furniture and Other division



Operating expenses and wages and salaries change in a different way on an annual basis. Over the years, wages and salaries have been on the rise and operating costs

have fallen, while in other years operating expenses have increased by more than the wages and salaries.

Figure 1.142. Annual growth rate of operating expenses and wages and salaries in % in the Wholesale and Retail of Furniture and Other division



Over the whole period there is an increase in wages and salaries in the division, as well as a slight decrease in the number of employees and employed persons. The average annual wages and salaries per employee in an enterprise in the wholesale and retail of furniture division increases gradually over the period, with the end-of-period values almost doubling those from the beginning.

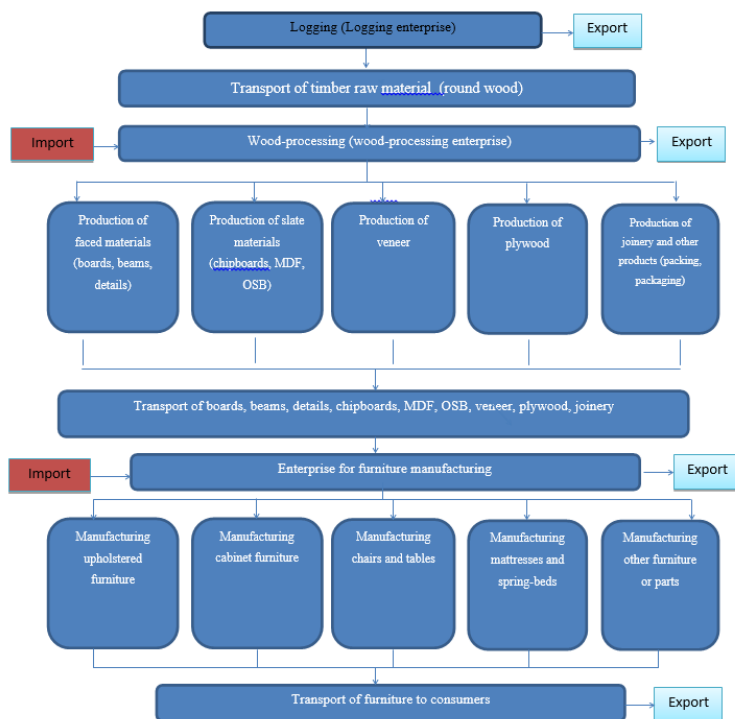
4. Contemporary Forms of Cooperating in Forestry Sector in Blagoevgrad and Kyustendil

The forms of cooperation in forestry sector in Blagoevgrad and Kyustendil region are along the supply chain, clusters, subcontract chains and networks, horizontal and vertical product lines.

Supply chain

The forestry sector includes many stages and different relationships between producers, suppliers, traders and consumers, depending on the variety of end products – wood slabs, veneer, plywood, furniture, furniture parts and more. The supply chain in general includes:

Figure 1.143. Supply chain in general



Deliveries from timber harvesting to the end user include, first of all, harvesting and transporting round wood to the woodworking plant for secondary processing. The secondary treatment can be carried out with the help of processed logs from the logging enterprises in Bulgaria or imported from outside the country. In the production of furniture, the slabs, veneers, plywood, etc. may also be produced by Bulgarian enterprises or imported from other countries. The finished product, in turn, is also a subject of export.

The leading Bulgarian producers in these fields in Bulgaria are:

- Boards, beams, doors – “Technowood” EAD, Razlog;
- Plywood – “Velde Bulgaria” AD, Troyan;
- Wood slabs – “Kastamonu”, Kazanlak and “Kronospon”, Burgas;

- Veneer – “Furnir Plast” Ltd. – Simitli.

There are also many companies supplying different materials in the sector and the mutually beneficial relationships with suppliers are essential for successful development. They are directly related to the concept of supply chain management and, more specifically, to the organization's ability to master its core principles, deploy and implement them effectively.

The leading companies in Bulgaria supplying DMP materials are:

- JAF – Bulgaria – importer of EGGER;
- “PRODES” Ltd. – importer of Haelele furniture fittings;
- “Solaris-M” Ltd. – importer of MDF, laminated LDF, natural veneers, technical veneers, solid wood, edging, plywood, CPL, HPL;
- “SALEX” – laminated and veneered panels, ABS and melamine edges, work desks and a full range of their accessories, colour MDF, furniture fittings and mechanisms of leading European companies;
- “Rali M” – furniture fittings BLUM.
- The total supply chain can be divided into different sub-circuits, depending on the location of the companies and the type of production:
- Logging > production of faced materials (boards, beams, details) > construction > consumers
- Logging > production of faced materials (boards, beams, details) > manufacture of furniture > consumers

Wood slabs – mat and gloss



- Logging > production of faced materials (boards, beams, details) > production of wood panels > manufacture of furniture > consumers

Veneer sheets



- Logging > production of faced materials (boards, beams, details) > production of veneer > production of wood panels > manufacture of furniture > consumers
- Logging > production of faced materials (boards, beams, details) > production of veneer > construction > consumers

Plywood – plain and bendable



- Logging > production of faced materials (boards, beams, details) > production of plywood > manufacture of furniture > consumers

- Logging > production of faced materials (boards, beams, details) > production of plywood > construction > consumers
- Logging > pulp production > packaging production > consumers

Joinery



- Logging > production of faced materials (boards, beams, details) > production of joinery > construction > consumers

Pallets



- Logging > production of faced materials (boards, beams, details) > production of pellets and briquettes > consumers
- Logging > production of faced materials (boards, beams, details) > production of packaging (pallets, crates, chests)

Pellets



- Logging > firewood > consumers

Firewood



The study of the supply chain in wood-processing and furniture industry in the regions of Kjustendil and Blagoevgrad in Bulgaria is directly related to the cooperation between companies with different activities. Companies working in wood-processing and furniture industry manufacturing furniture and supplying materials and machines can be: (<http://mebeli.info>)

Table 1.1. Woodprocessing and furniture industry supplying materials and machines

<p><i>Firms manufacturing furniture</i></p>	<ul style="list-style-type: none"> • cabinet furniture; • upholstered furniture; • office furniture; • commercial and specialized furniture; • garden furniture; • chairs and tables; • bathroom furniture
<p><i>Firms for materials for manufacturing furniture</i></p>	<ul style="list-style-type: none"> • wood and faced materials; • parts and semi-finished products of wood; • materials of mineral origin; • wood-sliced materials; • facing materials; • edges; • furniture fitting; • glues; • varnishes, ground coatings; • materials for protecting the wood; • materials for upholstered furniture; • mattress frames; • door and window fitting; • locks and locking systems
<p><i>Firms for machines, instruments, accessories</i></p>	<ul style="list-style-type: none"> • Production equipment and aspiration systems; • painting equipment; • abrasives and abrasive materials; • dryers and boilers; • cutting and power tools; • packaging and packaging equipment
<p><i>Firms for interior products</i></p>	<ul style="list-style-type: none"> • doors and windows; • stairs and railings; • flooring, parquet, laminate; • carpets; • interior textile; • mattresses; • glasses and mirrors;

	<ul style="list-style-type: none"> • white and black equipment; • kitchen appliances for embedding; • sinks and mixers; • faience, terracotta, sanitary; • accessories
<i>Service firms</i>	<ul style="list-style-type: none"> • varnishing and painting; • sharpening instruments; • work on toll; • repair and renovation of furniture; • designing; • consultations; • transport; • moving services
<i>Other firms</i>	<ul style="list-style-type: none"> • work clothes and PPE; • construction and architecture; • design; • specialized software; • projects; • consulting agencies; • other.

Clusters are strategically profitable groups of companies that cooperate, and in parallel, there is an uncompromising internal competition between them. The very combination of companies allows them to build better communications, to provide cheaper raw materials, to implement more science and applied developments, to create specialized training and education centres, and so on. It is for these reasons that clusters, as a form of public-private partnership, are perceived as one of the successful models that can help the Bulgarian business break through the international markets.

The cluster policy of our country, besides the actual expression in the present, should also have its projection in the future. In the period of our integration into the European Economic Area, this can only be done by taking into account the trends of development in the global economy and their impact on the sectoral and regional formations related to the new economy that can influence the formation of regional clusters in completely different ways. Of interest are those forms of cooperation that are linked to the process of value-added, downstream and upstream on the chain.

The authors Asheim and Isaksen identify two parallel trends in a globalizing economy, which together represent the development of local production systems (such as regional clusters) to global scientific systems run by transnational corporations:

- The first one is the tendency of replacing local systems with global ones – a large number of companies, including formally independent ones, are connected in networks that are directly or not controlled by large companies.
- The second trend represents the transition from production systems to knowledge systems as a result of the increasing “scientific” intensity of products.

Such development trends can reduce the importance of regional networks and clusters and increase the share of companies linked to global value chains. At the same time, it does not diminish the importance of geographical proximity, localized learning and personal relationships in stimulating innovation activity (Asheim and Isaksen, 2000).

Clusters

Clusters are a main microeconomic phenomenon that plays an important role in improving the competitiveness of enterprises in an increasingly globalized world. Enterprises that are part of a strong group have certain benefits in terms of: improving access to skilled labour in the relevant industry, good infrastructure, proximity to the relevant educational and research institutions, direct contact with the refined and demanding customer, access to specialized financial institutions and proximity to suppliers (Stoenchev, Ivanova, 2012).

In the context of the gradual removal of barriers to the movement of goods, capital, people and knowledge, it becomes increasingly important for individual countries to develop strong clusters that are competitive not only at national or regional level but also globally.

Bulgaria has considerable specialization in clusters, such as textiles and clothing, tourism, wine, furniture, essential oils, information and communication technologies, transport and logistics, clean technologies, etc.

However, many of the groups currently formed have not organized cluster initiatives. Currently, there are about 15-20 existing official cluster initiatives in Bulgaria, some of which have already received some support from the EU, while others are being created to get it. However, the availability of funding for the cluster's initial activity is not always the main problem.

The key issues Europe faces in terms of improving innovation activity and addressing the innovation challenge are:

- Need for new products and services, in line with changing markets and needs.
- Need to improve the efficiency of the process of “creating new ideas”, creating prerequisites for generating ideas and their subsequent successful realization.
- Dynamic economic processes are not a sign of fundamental changes in the trend, but they require flexible and adaptive strategies.
- Innovation is an indicator that shows the European vision of growth and prosperity.

Clusters can be catalysts in this process and function as the primary means of connecting individual territories and business sectors. Innovations are directed mainly to geographic concentration, much more than to achieving higher labour productivity. Clusters are regionally focused specialized companies and institutions connected to network connections and providing an environment suitable for innovation. This makes it possible for innovation to be “open”, to generate new ideas in the network of companies and institutions involved in the cluster.

Of course, this circumstance reduces the barriers to transferring new ideas to business and gaining from globalization. In today's competition, all clusters need to be innovative. Regions that combine venture capital, skills, and excellent research with strong cluster portfolios have much greater opportunities to increase innovation capacity, while regions without clusters or with isolated research are likely to be lagging behind in this respect.

Globalization leads to a further increase in benefits and clear cluster specialization. Strong clusters are possible in “open markets”, where cooperation with competing firms takes place inside and between clusters. Clusters are needed where competition between regions makes it possible for companies to choose the place for their activities on the basis of high economic efficiency rather than barriers of cross-sales and investments. Clusters can increase the potential of companies if they establish relationships with other clusters that provide additional resources and market opportunities.

Globalization increases the need to combine strong domestic variables of national companies and clusters with global capabilities, ensuring lasting interconnections with clusters and markets elsewhere. Clusters make it possible in particular for SMEs to gain advantage in the context of the global economy. Clusters receive key benefits in attracting capital, people and knowledge. Clusters are growing in regions that have specific advantages as a venue for business activities and cooperation. Firms reach full economic potential if they are well-matched to the markets and if they have good cooperative relationships. National and regional policies play an important role in mobilizing joint actions in the respected regions, including regional clusters.

Effective government policy on clusters is needed to mobilize a broad coalition of partners to integrate and encourage activities needed for the needs of specific clusters. The success of this policy depends on the actions of many different players, state and public agencies at different levels, companies, investors, trade associations and chambers, educational and research institutions, as well as other institutions impacting the business environment of clusters. Increasing the potential of clusters, moving them from cooperative companies in a particular region to high levels of cooperation and interaction is a central task for regional and national governments. Cluster initiatives are an important tool to help achieve this goal.

National and regional policies are critical to improving the business environment, working on cluster initiatives and focusing on clusters as a transmission for innovation and growth. Clusters emphasize the importance of strong territorial policy in a world where the local and global network is crucial to business success.

Most relations and interactions in the network structure increase the added value associated with access to and development of intellectual capital. Improving competition through deepening the internal marketing remains a major challenge to European policy. The possible transnational cooperation between clusters needs to be developed in line with European initiatives and to broaden national and regional policies. European policies also influence the business environment in Europe, where improvements require coordination of activities in different countries.

European institutions influence directly or indirectly by providing knowledge and assistance to improve national and regional policies. Cluster initiatives require companies of a different type, which are important partners in the network. Successful cluster policy determines where companies, alone or through industry associations and other networks, are fully engaged and successful, identifying the critical areas of cooperative activity, markets, or related industries. In some cases, industrial networks are the first drivers of cluster development and they can play a decisive role and influence on public authorities to support this process.

European countries and regions develop a wide range of cluster initiatives.

Some countries have launched cluster initiatives and have policies in place for a long time – Spain, Catalonia, Italy, Scotland, United Kingdom, France, Denmark, Netherlands. Other countries have activated in the past few years, such as Austria, Czech Republic, Sweden and others.

Europe is now among the most active regions of the global economy in terms of cluster initiatives. The European Commission is working on too many policies and thus influences the development of clusters in Europe. European policies “as stand-alone marketing programs” cover cluster development indirectly, taking into account changes in the European business environment. Other European policies influence

cluster development directly through “European programs” or by supporting cluster policy efforts at national and regional level.

Participation of companies in cluster formations and entrepreneurial networks is a way to increase their economic power and potential and the opportunity to counteract to the threats, which are currently expressed in:

- Strong competition on the European markets for the products produced in Bulgaria, especially furniture and other wood products.
- The invasion of Asian producers on the European market, offering relatively quality but lower-priced furniture and other products from exotic wood and bamboo.
- Limited assortment and structure of Bulgarian wood-based products with low degree of processing and low competitiveness compared to imported ones.
- Shifting from the application areas of wood-based production to analogue ones, with the participation of PVC, aluminum and others.
- Lack of well trained professionals and skilled labor force.

Adding to all this the great opportunities through the EU structures in terms of markets, joint research projects, innovation policy, etc., it is obvious that the inclusion in these structures is possible and effective on the way to configuring the enterprises in various in content and consolidation goals clusters.

The clarification of the nature and mechanism of interaction between enterprises and their productions is presented in a sample cluster model in the forestry sector. It includes a logging enterprise that carries out forestry activities or enterprises in the configuration area of the cluster. The logging enterprise provides the necessary woody raw material for the sawmill enterprise and the enterprise producing plywood and chipboards. The stable production relations established between them allow much more effective logging and realization of the timber, both large and medium, as well as small (or technological) timber. The logging enterprise receives strong economic, financial, information and exploitation support from related links and enterprises in the cluster.

A specific feature is that individual enterprises are differentiated for cutting out to details, both from solid wood and chipboards, thus creating opportunities for a much more efficient use of the already produced wood-based materials and covering the resulting technological waste. The technological waste produced in them, together with the woodworking enterprise and the plywood production, is directed as a secondary raw material to the enterprise for producing particle boards. It should be pointed out that these technological wastes are not very small because in the plywood

production they are between 35 and 40% of the processed wood quantities, in the woodworking production – 10 to 15%, and in the production of details from solid wood – about 20%.

The interests of the cluster determine also the need to create a separate enterprise or production unit for enhancing the particle boards through laminating and/or masking, which, after cutting and profiling, along with the details of solid wood, are provided according to the specific applications of the enterprises producing final products (furniture, joinery, wooden houses).

The cluster can also include production units with organized production of plastic parts, facing, mechanisms and equipments of metal, paints, varnishes and chemicals. With the established links and relationships with the producers of wood-based final products, they outline very clearly their product structure and development trends. This guarantees them their desired efficiency and sustainable development. On the other hand, the furniture enterprises and those for production of joinery and assembled wooden houses, through partnership and mutual work with these enterprises, are given the opportunity to satisfy precisely their own needs.

In the model is also configured an enterprise for production of logging equipment, woodworking machines, equipments and spare parts. Of course, it is universal equipment, not set installations or technological lines, which in our country are not currently being manufactured. Nevertheless, the needs of the participating enterprises in the cluster are considerable, as there is a great need for universal woodworking equipment (saw blades, circular saws, planing and milling machines, etc.) and harvesting equipment, in addition to transport equipments, dust extraction installations, spare parts.

It is planned the scientific and information services and provisioning to be also carried out by specialized units set up for this purpose.

It is noticeable that in the model much more clearly are outlined the vertical technological links – from logging and woody raw material, through its primary processing to stamped and slated materials, production of details and elements from them, to finished products furniture, joinery, wooden houses. It is natural that in the mutual work between groups of enterprises in the cluster develops, though less outlined, horizontal relationships between the enterprises producing final products concerning the coordination of a common technology policy, product structure, market positions, etc., as well as of the requirements imposed by them and the agreed technical-technological policy, which must be met by the production in the enterprises from the level of primary processing of the wood raw material. Horizontal links also develop in the scientific, innovation and information areas.

This sample model has a place for development especially in the distinguished powerful centres for woodworking and furniture production in the regions of: Troyan, Teteven and Lovech; Veliko Tarnovo, Gabrovo; Stara Zagora, Sahrane, Kazanlak, Plovdiv; Targovishte, Kubrat, Dobrich; Burgas, Yambol, Sliven; Varna, Dolen Chiflik, Shumen; Velingrad, Pazardjik, Peshtera, Bratsigovo, Batak; Blagoevgrad, Simitli, Razlog and Bansko; Smolyan, Chepelare, Asenovgrad, Haskovo.

Mentioning these territorially related areas does not mean that other cluster branch formations could not be formed and involving non-territorially related enterprises and companies from the country.

The cluster model can be considered as expanded and more complete, in terms of the covered productions in it and the degree of development of the vertical technological lines and of the horizontal relations. However, this does not mean that no different variants of manifestation can be constructed depending on the character and the goals to be realized by the individual furniture and woodworking enterprises and firms – innovative, market, product, investment and others.

The cluster as a group of firms is most often seen in territorial proximity, technologically and product-related enterprises. In many places there are forms of cooperation similar to clusters, but not yet organized as a cluster. There are 13 particularly favourable industries in Bulgaria for establishment and operation of clusters, including the Wood-processing and Furniture Industry. In the Forestry sector, the goal of creating clusters is to efficiently use timber resources and increase the competitiveness of interrelated firms (Grigorov, 2012).

Great advantages can be achieved by firms that are united in entrepreneurial networks and unions at local level, in certain territories in the so-called clusters. The competitive advantages of these clusters are determined by the available infrastructure, technical means of communication, large industrial areas with free production capacities, quality of the labour force and others. With the formation of a cluster, trustworthy relationships and support, exchange of information, distribution of innovative products, etc. are established between the different manufacturers (Grigorov, 2008).

Cluster initiatives in timber harvesting

In the new Law on Forests, for the purpose of long-term planning of activities, both in state-owned forest enterprises and in logging and wood-processing companies and timber biomass firms, it is foreseen that State Forest Enterprises may enter into long-term contracts with traders for 15 years, both for extraction and sale of timber. In this way, opportunities are created for: certainty of the timber resource; investments in new machines, equipment, infrastructure, qualification of workers and personnel, and

last but not least for sustainable production, management and implementation of the foreseen use of the forests.

The implementation of cluster initiatives in timber harvesting reflects the new role of business, government and institutions for improving the relationships and interactions between the different subjects in the sector.

In 2007, a cluster is created in the forestry sector in Kardzhali. Among the initiators are logging production firms. The first project idea is to create logistical and technological opportunities for the use of waste biomass from logging to create heat energy production for the needs of the public and private sector in Kardzhali region.

The name of the cluster “The Green Carpet of the Eastern Rhodope” shows the founders' intentions to increase the competitiveness of the forest industry as an integral part of the sustainable development of the region.

According to the Energy Utilization of Biomass Association (EUBA), a targeted government policy for the promotion and mass introduction of biomass utilization technologies is needed as an alternative energy source.

Experts from EUBA express the opinion that grant schemes and preferences for household customers can be provided when investing in the replacement of the combustion base with conventional biomass fuels. At present, financial incentives for consumers are exhausted with providing by The World Bank of a grant of up to 20% for target credit to apply energy efficiency measures, and this covers interests on loan servicing, granted by commercial banks.

According to calculations of the association, biomass heating is cheaper than all other conventional sources, and the production of energy from biomass is cheaper than the one from sun and wind. It is more expensive to produce heat from biomass co-generators than direct biomass heating, because in the co-generators the district heating plants add a surplus charge.

According to evaluations of the experts of the association, the share of the technical potential of solid biomass is 34% of the total potential of renewable energy sources in Bulgaria and its use should become a national priority.

EUBA proposes clusters to be created between interested market subjects such as timber companies, transport and logistics structures, biofuel producers and companies for equipments of using biomass, as well as be reduced corporate tax rates for companies in this branch and to be created simpler and clearer administrative procedures for investing in the production of biomass fuels, technologies and facilities for their use.

Cluster initiatives

The wood-processing and furniture industry is among the strategically important sectors of the Bulgarian economy. The sustainable growth of the sector over the last 10 years shows significant potential for future development, including cluster initiatives. This industry is characterized by stable raw materials, on the one hand, and the accumulated experience and traditions of the long history of its existence, on the other. The enterprises in the industry produce a wide range of wood products both for domestic and foreign markets.

In Bulgaria, furniture is produced mainly from coniferous wood, and worldwide demand is mainly for deciduous wood products – beech and oak, in particular. Approximately 40% of Bulgarian production is export oriented mainly to Italy, France, Germany, the Arab countries and the USA. Objects of export are mainly elements for pallets, boards and to a lesser extent, timber. In terms of furniture, exports are mainly in product groups – chairs, upholstered furniture and furniture made of solid wood, mainly oak.

For the improvement of the competitiveness of the sector, cluster initiatives are created and developed, covering both wood-processing and furniture firms from certain regions, as well as companies from the sector, which cooperate with suppliers of raw materials and logistics and sales companies, along the chain of creation value added.

The formation of clusters is an appropriate and working model in the furniture industry in the EU, and Italy is an example of this. The Bulgarian wood-processing and furniture industry is mentioned as a favourable sector for the development of clusters by Ministry of Economy, Energetics and Tourism. First attempts to create clusters in Bulgaria took place in 2001-2002 (PHARE, ГТЦ): (Hristova, 2011)

- Mesta, Razlog – Woodworking and furniture;
- Plovdiv – Perfumery, cosmetics and essential oils;
- Rousse District – Wine Cluster.

There are two unsuccessful attempts to develop clusters in the sector – in Troyan and Velingrad, and one working up to now – Bulgarian furniture cluster.

The idea of creating the cluster in Troyan is to improve inter-firm cooperation in the region by creating common distribution channels, purchasing raw materials and materials, packaging and orders. The goals of the cluster are to support its members through information: on modern materials, technologies and equipment, innovations, changes in the legislation in the branch; on the state and the opportunities for realization of trade relations and cooperation on international markets; on the possibilities for inclusion in various EU programs to support SMEs and to obtain

credits from Bulgarian and foreign financial institutions; on participation in organized seminars, qualification courses, etc.; on current issues in the industry.

The cluster in Velingrad includes firms that carry out their activity on the territory of the municipality of the same name. The concentration of many furniture companies in the region is a prerequisite for uniting some of them in order to improve their competitiveness. Each of the firms covers the entire production process, from the raw material to the final product, for the purposes of its own production. Among the main goals of the cluster are maintaining and expanding the positions in terms of total ensuring of raw material and distribution of the work in the general production process. Another task is the development of quality criteria to be met by the products, which will receive the brand “Rhodope Furniture”. The marketing objectives include the imposition of the branded products on the Bulgarian market.

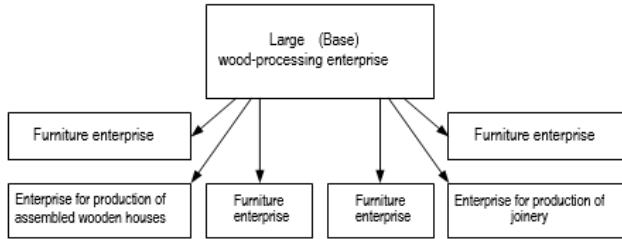
The Bulgarian Furniture Cluster unites firms and organizations that are not in territorial proximity but are leading in the sector, including design studios, consultancy firms and universities.

The practice of activating clusters as a form of inter-firm cooperation in the country in recent years shows both positive and negative aspects. It does not differ from the practice of other European countries, which have gone this road. There are, however, well-developed international and especially European dimensions, in which Bulgaria is about to “be involved”. The important thing is that Bulgarian firms are well aware of what prevents them from expanding, competing and updating, and therefore they are trying to create inter-firm partnerships in different areas.

Subcontract chains and networks, horizontal and vertical product lines

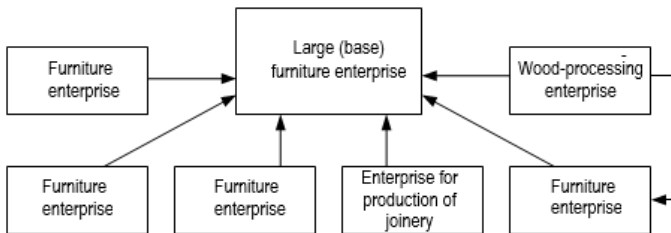
SMEs in the forestry industry in Bulgaria often cooperate with other companies to meet large customer orders. Subcontracting links are implemented both between small and medium-sized enterprises and between large or so-called base enterprises and SMEs. Basic woodworking companies are the ones for production of chipboard, MDF, plywood and others. The interaction between them and SMEs is realized through the development of technological specialization in the basic enterprises towards further cutting to detail, grinding, veneering and other types of finishing. These technological operations, instead of being carried out in SMEs, are transferred to the base enterprises. The process of technological specialization increases the efficiency of production in both groups of enterprises. In the first case, because the production operations are centralized in one place and are produced with less relative costs, in the second – from savings to purchase expensive machines and consequently from their non-loading, as the needs of the small enterprise are many times less than the production power of the equipment.

Figure 1.144. An example model for a subcontractor network in the wood-processing and furniture sectors with predominant links from the SME to the base furniture enterprise



It is possible the direction of the subcontracting network relations to be the opposite, i.e. from the SME to the base enterprise. An exemplary illustration of this case can be a large-scale furniture factory with many sub-suppliers of complementary details (solid wood or slate materials), which it itself is not efficient to produce. The final assembly of the finished product is carried out at the base enterprise.

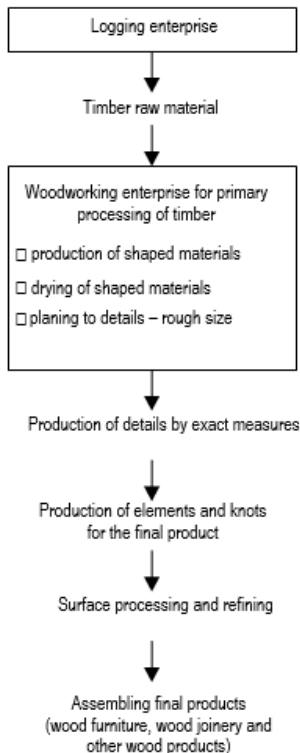
Figure 1.145. An example model for a subcontractor network in the wood-processing and furniture sectors with predominant links from the SME to the base furniture enterprise



Unlike subcontracting chains and networks, which are relatively constant in character and are built on a production technological feature in distinction from simple material and technical supplies, horizontal product lines are developed and are mainly the result of horizontal production specialization and cooperation between the individual enterprises, usually sets of different types of devices are configured. Through the horizontal product lines the participating enterprises in them realize a synergic effect of acquiring new or improved technologies, ways of processing raw materials and

materials, organization of production, labour and management, etc. The interaction between companies also affects the quality of output towards increase.

Figure 1.146. An example for horizontal product line



As can be seen from the sample models, the horizontal specialization in the branch can be evolved, both to building product lines and to sub-fabricated ones. Not only companies from the industry but also from other industries can participate in them, companies producing glass (details of reinforced, matte, mirror, figure and other types of glass), plastic parts, metal mechanisms, marble countertops or stands, etc.

Particularly characteristic of the forestry sector is the development of vertical technological lines, due to the fact that the timber and its production are the main raw materials, which are processed in succession, passing through all phases of production. These close links between the various productions based on raw material, technology and manufacturing, are the basis for continuous improvement of the production through the different processing phases, for the improvement of the level

of technique and technology, for increasing the efficiency in the different production units, as well the overall economic efficiency. This economic efficiency is even more pronounced in the branched vertical technological lines with the inclusion of the secondary wood resources (technological waste) in the production of chipboard, briquettes, briquettes, cellulose materials etc.

Figure 1.147. A model of vertical technological line

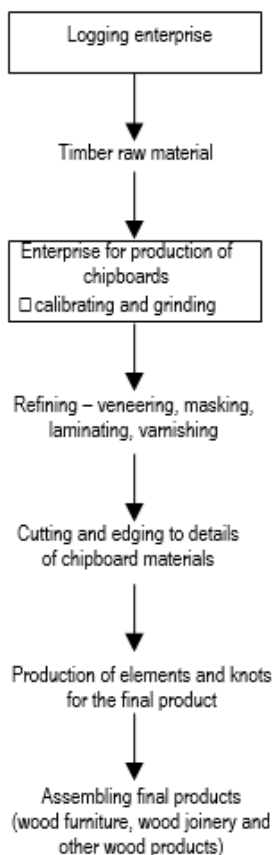
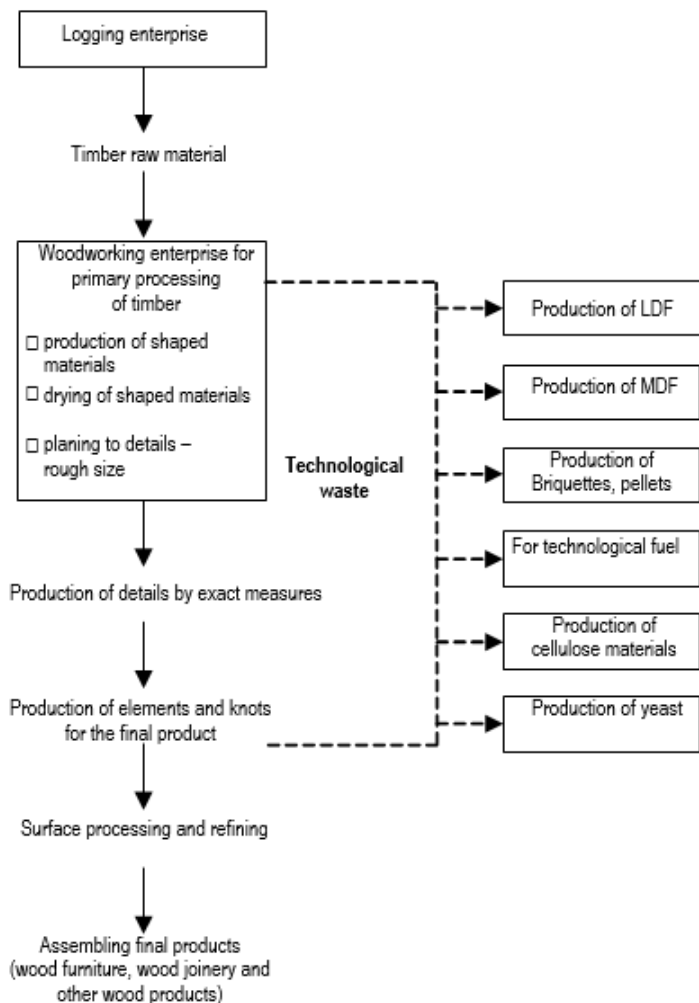


Figure 1.148. A model of product



The sequence of processing of solid wood and chipboards allows the collection of all processing phases at one site, i.e. on a production site (formerly the combined form of organization of production) and their division in the space and their execution from different production units. This dividing and merging on the basis of similarity and

uniformity of the technological operations in one place gives very good opportunities for the integration of SMEs in the technological lines. Of course, besides the many advantages, there are also negatives, especially with the danger that the links between the different units lose their flexibility, but with skilful managerial approaches and methods of management, these dangers can be overcome, as well as by forming a set of several short in vertical direction technological lines.

In order to preserve the already limited timber reserves and to reduce their use, it is becoming increasingly important for the industrialized countries to include in the material balances sources from the recycling of discarded wood products, in addition to technological waste. The reasons for such an approach are not only economic, but also ecological and social, which determines the importance and the attitude to these issues for our country at present and in the future. Their successful solution can be achieved through the establishment of specialized units to organize the collection of these secondary wood resources and their preparation for submission in the production of new products. These specialized units can be included in the technological and subcontractor networks and thus the policy for recycling discarded materials or wood products would be placed on a solid organizational and technological basis.

Rational use of timber resources and environmental protection can be accomplished by:

- Encouraging the introduction to production of low-waste and non-waste technologies, as well as more sophisticated production processes and technologies in the construction of new or reconstruction of existing capacities, the production of products with increased durability, easy repairs and re-use, if possible;
- Organizing the production of environmentally friendly and resource-saving productions for the preservation of forest wood resources and their environmental, recreational and sanitary-hygienic functions;
- Extending the terms of operation of different types of external wooden lining and constructions, sleepers, supports, pillars, etc. by antisepticising, impregnation and drying of wood;
- Stimulating the establishment and development of vertical technological relations, subcontracting networks and cluster formations, which would create good opportunities for increasing the level of processing of the timber raw material and its complex use.

The approach in these forms is for “clean production” and the pollutants to be neutralized at the source of origin, by changing the manufactured products and the running processes or even at their design phase, as opposed to the “end of pipe”

approach, where control and appropriate measures are taken at the output of the production process, after the problems have already occurred.

The economic effect of “clean production” is reflected in reduced material loss and purchase costs, increased productivity – reduced production costs, reduced costs for handling or utilization of waste, etc.

Environmental benefits are realized in: less waste entering the environment – reduces the level of human impact on ecosystems and increases their sustainability; prevents the transfer of pollutants from one environment to another (reduces the level of consumption of natural resources; replaces exhaustible natural resources with renewable ones; replaces biologically indestructible materials with biodegradable materials; better working environment for the health and safety of personnel.

There are great opportunities for deploying various subcontractor relations and interactions between enterprises and productions in the wood-processing and furniture sectors. In this regard, two typical sample models for subcontracting networks are proposed: the first one has predominant links from a large (base) woodworking enterprise to SMEs for the production of wood-based final products; the second model has predominant manufacturing and technological links from SMEs producing complementary details and elements to a large-scale furniture enterprise.

Unlike the subcontracting chains and networks of a relatively constant nature and built on a production-technological criterion, the horizontal product lines are unfolding and mainly the result of horizontal production specialization and cooperation between individual businesses, usually configuring sets of different kinds of products or details about them. The versions of models of horizontal product lines are different, but they all have synergistic effects of acquiring new or improved woodworking technologies, in the organization of production, labor and management, of system productivity, diversity in assortment and quality of production, etc.

The integration processes between woodworking companies and enterprises and their inclusion in vertical entrepreneurial networks are mostly expressed and result of the sequence in the technological processing of the timber raw material and its materials. The establishment of vertical technological lines, passing through the different stages of wood-processing to the production of final products due to the very strong technological links, has a significant influence on the level of the used equipment and technologies, on their improvement and the efficiency of the processing of wood, as well as on the possibilities of its complex use, which is very well seen in the model of the branched technological lines. Of course, the efficient use of wood is also practiced in the models of vertical technological lines (long) in the processing of both solid wood and in the production of slabs and their subsequent processing.

One of the strategic directions of the EU's Forest Technology Policy is the inclusion of the resources from the recycling of discarded wood-based products, together with the technological waste in the material balances. The successful resolution of these issues for Bulgaria can be accomplished through the establishment of specialized units for organized collection of these secondary wood resources and their preparation for submission in the production of new products. These specialized units can be included in technological and subcontractor networks and thus the policy of recycling discarded materials or products from wood should be placed on a solid organizational and technological basis. There are good examples and experiences in countries such as Germany, Italy and others.

Business managers in the sector identify among the main problems the lack of staff, low export readiness and raw material ensuring. The transportation of raw materials and materials represents a significant part of the production costs and this puts the focus on the need to study the supply problem in the wood-processing and furniture industry (BBCWFI, 2015).

The inter-firm cooperation in the sector is considered a powerful means of entering the international market, but less than 40% of the furniture firms participate in some of its forms (45% of them in the country and 21% in the region where they are located). Firms point out the cluster form of cooperation as a modern instrument and form to increase their competitiveness, but the unsuccessful attempts of such cooperation in the food-processing and furniture industry indicate that furniture firms cannot yet actively use the advantages of such cooperation (Ivanova, Popova, 2009).

The forms of cooperation can be various, given the complexity of the final product and the components, on which furniture manufacturing depends. Long-term contracts exist mainly on the supply of materials, machines, instruments and other components for furniture manufacturing.

CHAPTER TWO. INNOVATION AND COMPETITIVENESS IN FORESTRY SECTOR IN CROSS-BORDER REGION

This second part of the study presents results of survey of forestry sector enterprises, applying one and the same methodology and negotiated questionnaires to identify the innovation and competitiveness performance in forestry sector in cross-border region..

1. Innovation and Competitiveness in Forestry Sector in Blagoevgrad and Kyustendil Regions (Results of a Survey in 2017)

The paper presents results of a survey among the companies from the forest sector and the companies related to the supply chain in the regions of Blagoevgrad and Kyustendil in Bulgaria. The survey summarizes the data from the conducted on-line and field survey, based on face-to-face interview of 107 companies in 2017. Applied methodology follows recommendations of OECD and EUROSTAT Oslo Manual for collecting and interpreting technological innovation data. Applied definitions are given in Annex 1.

The study is aimed at fostering the competitiveness and the cross-border cooperation through

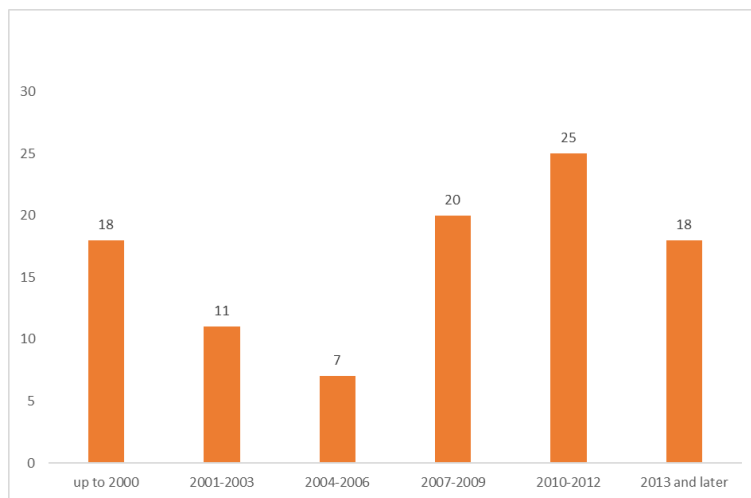
- examining and defining initiatives for innovation cooperation between the forestry enterprises of Blagoevgrad and Kyustendil regions in Bulgaria and the Northeastern, Eastern and Southeastern planning regions of Macedonia
- Studying the obstacles and the ways to overcome them
- Defining ideas to increase the productivity, economic growth and investment in the region

characteristics of respondents

Our research has shown that 63% of the companies that were surveyed were established in 2007 or later. Despite the financial crisis, there was a sharp increase in the number of newly set up businesses during the years 2007-2009 in the observed sectors. In the period 2004-2006, 7 enterprises were started in the regions of Blagoevgrad and Kyustendil. That number almost tripled in the period 2007-2009, reaching 20 companies which then started operations. 18% of the businesses which

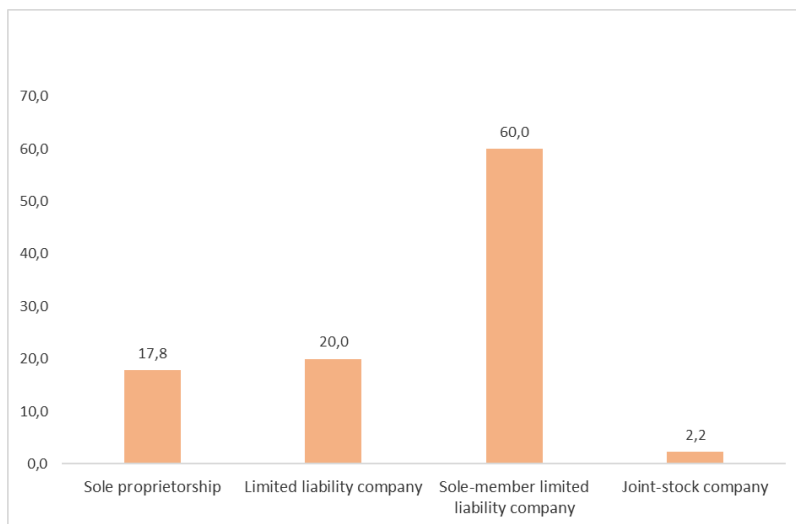
completed the questionnaire were set before the year 2000 and another 18% started their operations in 2013 or later.

Figure 2.1. Year of establishment of the companies surveyed (share of the companies presented as %)



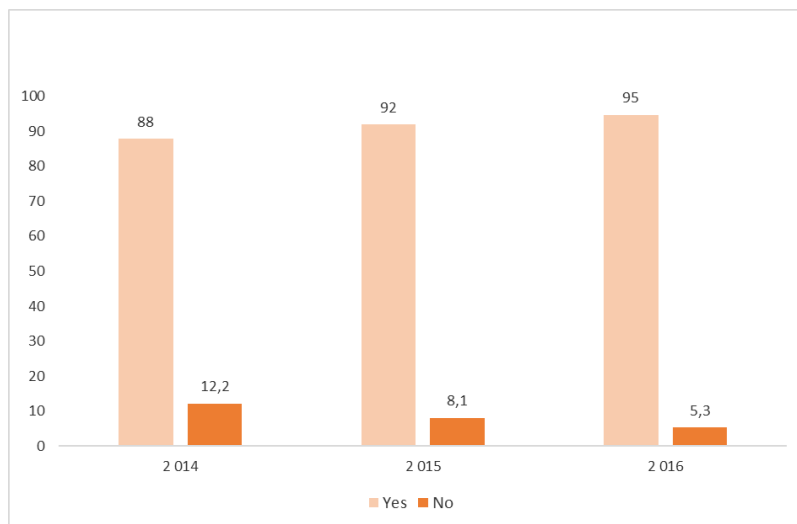
The majority of the companies are privately-owned by Bulgarians. They are typically independent enterprises, not part of other business entities.

Figure 2.2. Legal status of the companies surveyed (share of the companies presented as %)



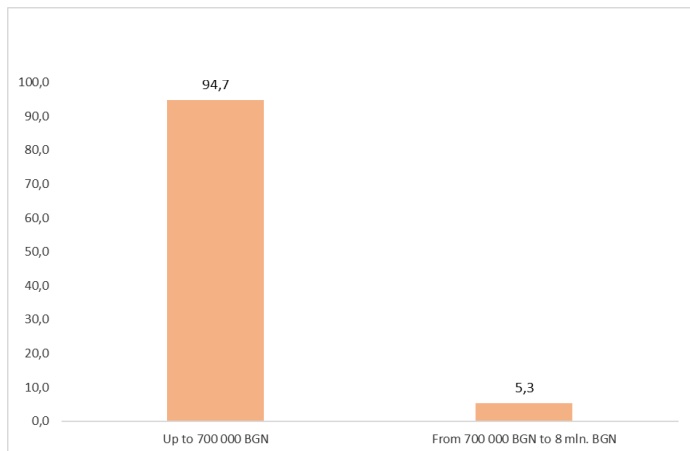
The most common type of business entity in the sector and the region is the sole-member limited liability company (EOOD) with 60% of the businesses that participated in the survey operating under this legal status. Sole proprietorships or ET (17.8%) and limited liability companies or OOD (20%) are also widespread. 2.2% of the respondent companies are joint-stock (AD).

Figure 2.3. Has the company been operating in the following years? (share of the companies presented as %)



88% of the companies which took part in the survey were operating in 2014. The percentage of the businesses that were operating in 2015 and 2016 was on the rise. 92% and 95% respectively of the respondent enterprises were producing in those years. This shows not so stable business environment as some of the companies do not operate sustainably and miss some of the years. Evidence for this is given by the fact that some of the companies send their financial report but are not operating on the ground. The share of these companies is around 1-2% of the total sector.

Figure 2.4. Book value of the assets (share of the companies presented as %)



The book value of the assets of 94.7% of the companies in the regions of Blagoevgrad and Kyustendil is either below or equal to 700 000 BGN. This fact is an indication of the small scale of the operations of the enterprises. Under that criteria, the businesses could be classified as microcompanies (according to the Law on Small and Medium-Sized Enterprises). 94.6% of the business entities have a net sales revenue of 1.4 mln. BGN or less. This further suggests that the enterprises could fall into the category of microcompanies.

Figure 2.5. Net sales revenue (share of the companies presented as %)

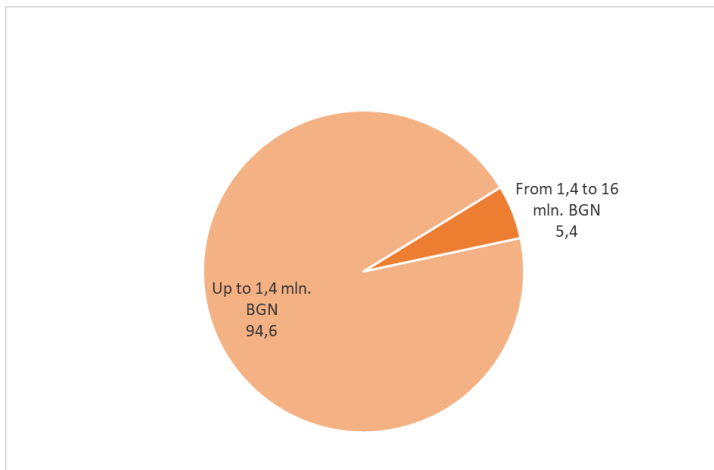
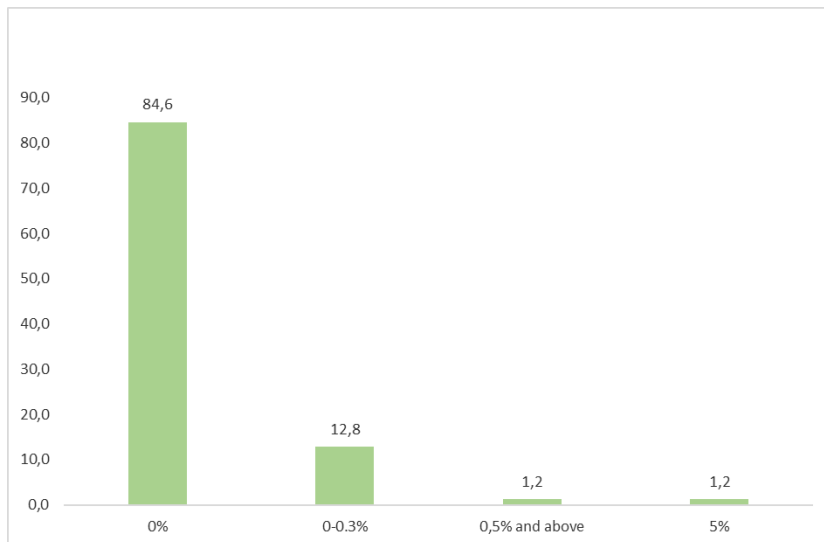
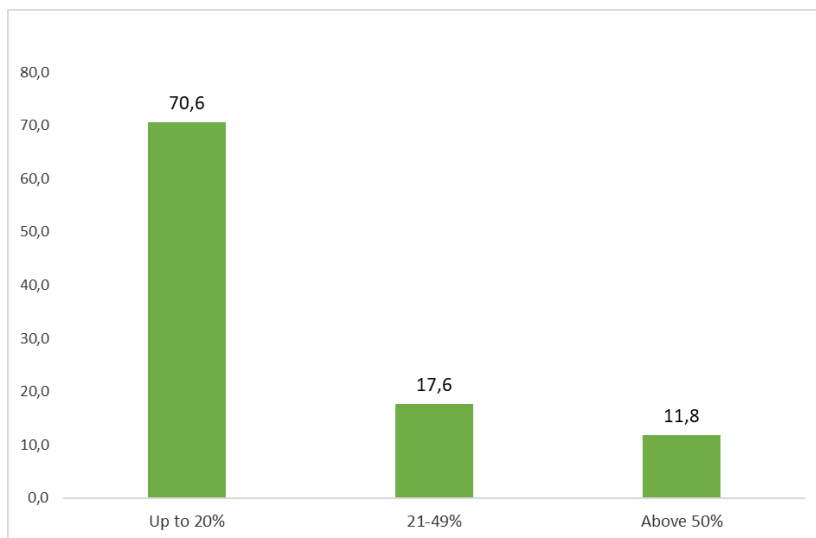


Figure 2.6. R&D expenses related to the turnover of the company (share of the companies presented as %)

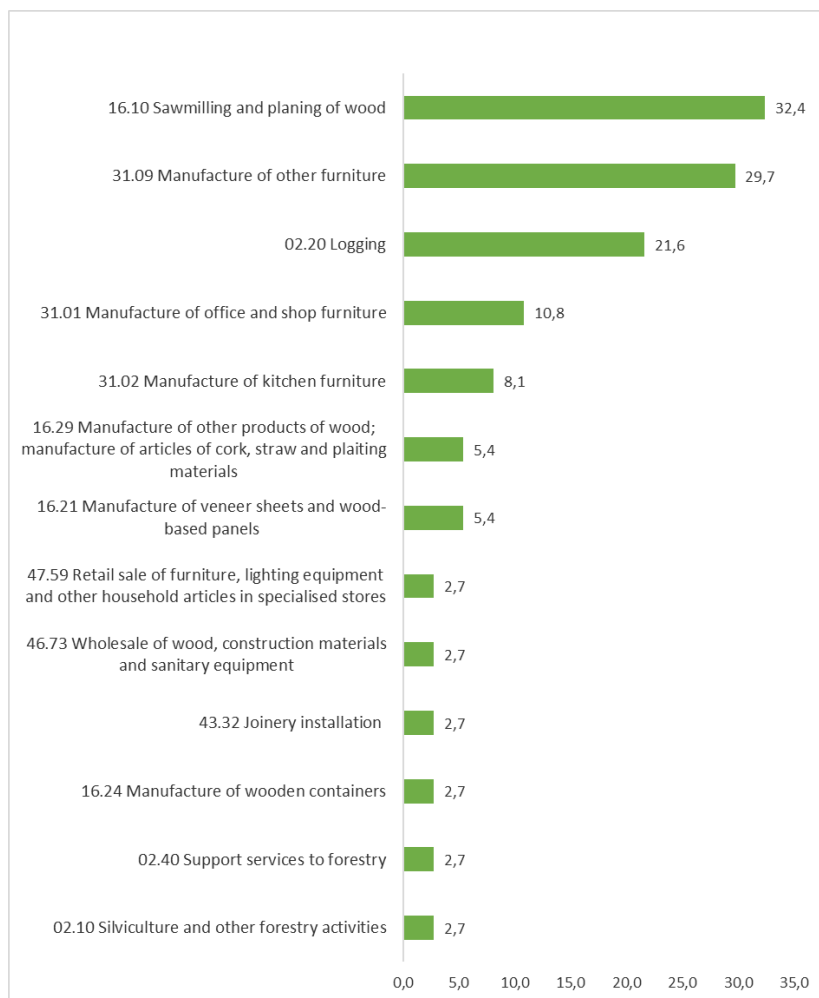


The expenses on research and development activities of the companies in the region of Blagoevgrad and Kyustendil are relatively low. Among the enterprises participating in the survey, 84.6% spend 0% of their turnover on R&D and 12.8% of the businesses spend between 0% and 0.3% on such activities. 1.2% of the companies spend 0.5% or more of their turnover on research and development and another 1.2% dedicate 5% of their turnover to researching and developing new products. The R&D expenses are directly related to the introduction of innovations to the market. Innovations could help companies be more competitive not only locally, but abroad as well. Additionally, a greater level of innovations contributes to more value added to the production. The low levels of investment in R&D are a prerequisite for a modest market performance of the companies in the observed sectors. That might also hinder the enterprises from being competitive on the Bulgarian and the European market.

Figure 2.7. Export intensity (export/turnover or export share of total turnover)



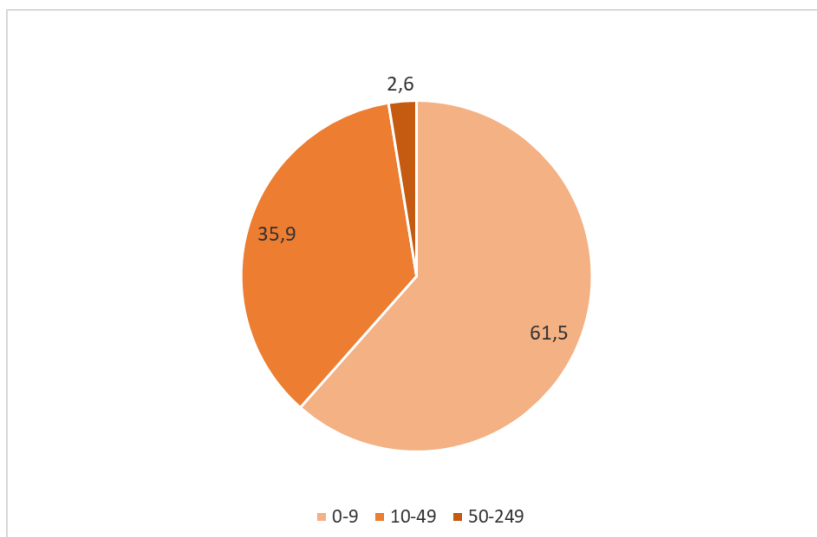
The export intensity (or the exports as a share of the total turnover of the companies) is typically below 20%. 70.6% of the companies which participated in the questionnaire indicated that they export 20% or less of their total turnover. Thus, the majority of the companies of the observed industries are more domestically oriented and a small percentage of their production is exported. 17.6% of the businesses in the sector point out that between 21% and 49% of their produce is sold abroad. 11.8% of the enterprises export more than a half of their production. Competing on foreign markets validates the businesses (their production is of sufficient quality so as to compete internally and abroad) and might increase the revenue of the companies.

Figure 2.8. Economic activity under NACE Rev. 2

The operations of 32.4% of the companies that participated in the survey fall into the economic activity 16.10 Sawmilling and planing of wood. 29.7% of the businesses are part of the economic activity 31.09 Manufacturing of other furniture under NACE Rev.2 and 21.6% belong to the 02.20 Logging. The activities of the companies in the observed sectors, among others, are also 31.01 Manufacture of office and shop furniture, 31.02

Manufacture of kitchen furniture, 16.29 Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials and 16.21 Manufacture of veneer sheets and wood-based panels.

Figure 2.9. Average number of employees for the reporting period



The majority of the enterprises could fall into the category of microcompanies, according to the criteria related to the numbers of people employed of the Law on Small and Medium-Sized Enterprises. 61.5% of the companies in the survey indicate that the average number of employees is between 0 and 9. 35.9% of the enterprises in the regions of Blagoevgrad and Kyustendil have between 10 and 49 employees. In 2.6% of the businesses the people employed are between 50 and 249. The predominant gender for the companies in the observed sectors is male (64.3% of the employees).

Figure 2.10. Gender of the respondents

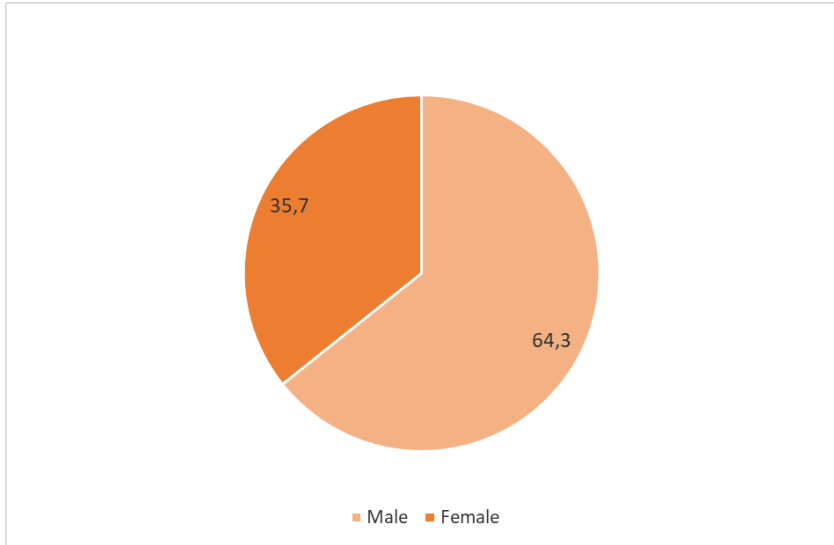
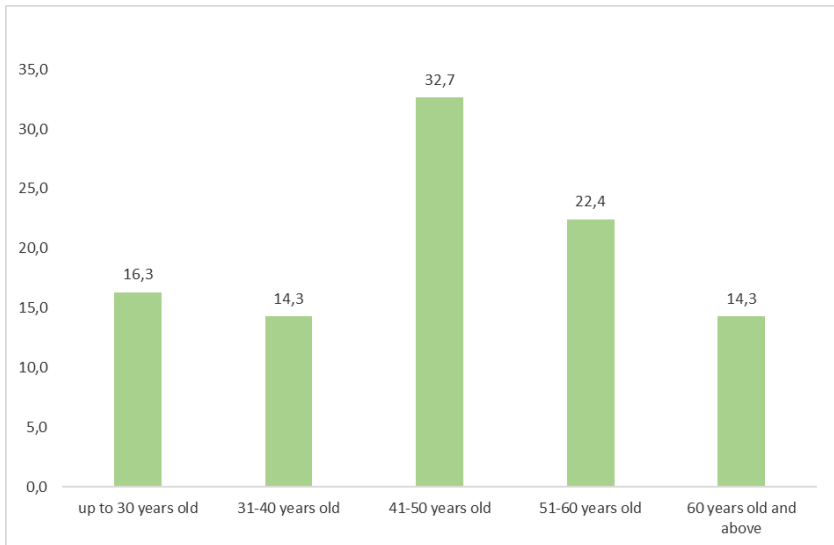
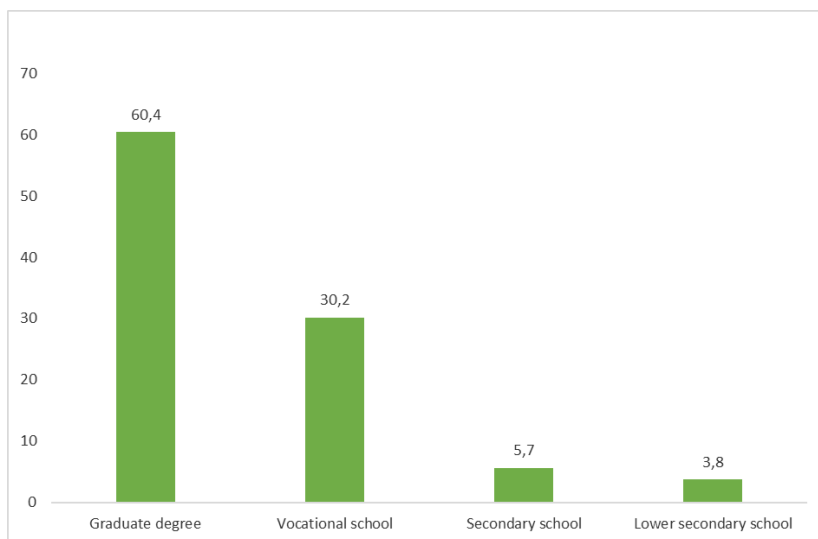


Figure 2.11. Age of the respondents

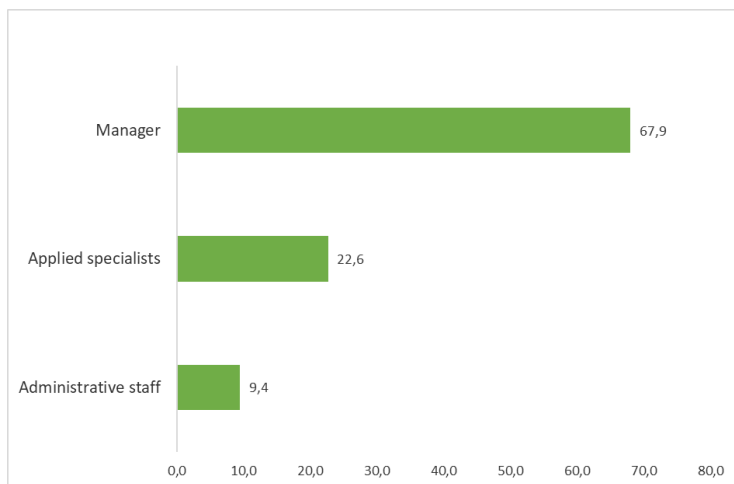


32.7% of the employees in the companies that responded to the survey are aged between 41 and 50 and 22.4% are between 51 and 60 years old. More than half of the employees which participated in the survey are between 41 and 60 years of age and approximately 70% of the respondents are 41 years old or older. 16.3% of the people in those enterprises are 30 years old or younger. 14.3% are aged between 31 and 40 and another 14.3% are 60 years old or above. The aging workforce in the enterprises in the region might be a problem in the medium to long-term perspective. That issue emphasizes the need of attracting younger workers to the sector.

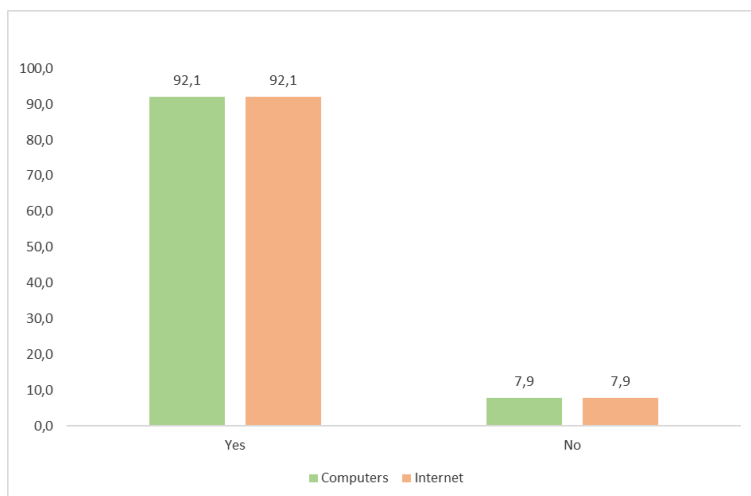
Figure 2.12. Education of the respondents



The majority of the employees (60.4%) indicate that they have graduate degree. 30.2% of the respondents have completed their education in vocational schools. 5.7% and 3.8% have graduated secondary or lower secondary school respectively.

Figure 2.13. Occupation of the respondents in the company

Since one of the requirements of the conducted survey was that it had to be completed by the manager of the enterprise, most of the answers collected (67.9%) were those of the chief executives of the companies. 22.6% of the questionnaires were filled by applied specialists and 9.4% of them – by administrative staff. Consequently, the views expressed in the survey are predominantly those of the managers of the companies.

Figure 2.14. Do you use computers and the Internet in your company?

92.1% of the companies in the regions of Blagoevgrad and Kyustendil in the observed sectors use both computers and the Internet. In addition, 61.8% of the businesses that use the Internet have a fixed or broadband connection. The rest of the responding companies use mobile connection.

Figure 2.15. If you use the Internet, what is the type of connection?

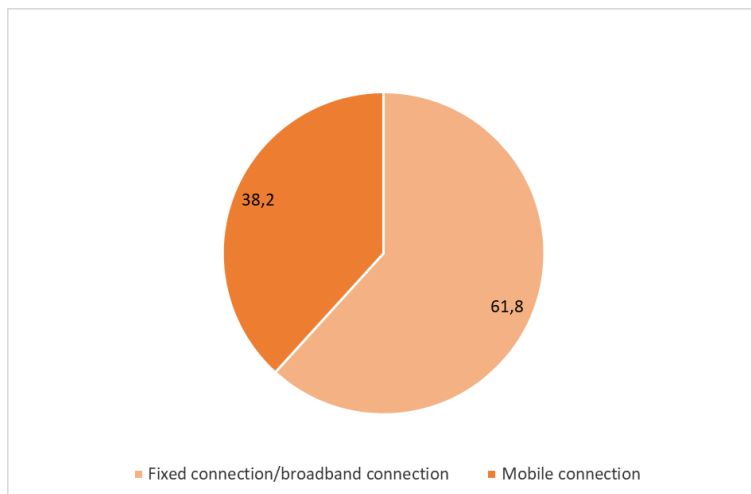
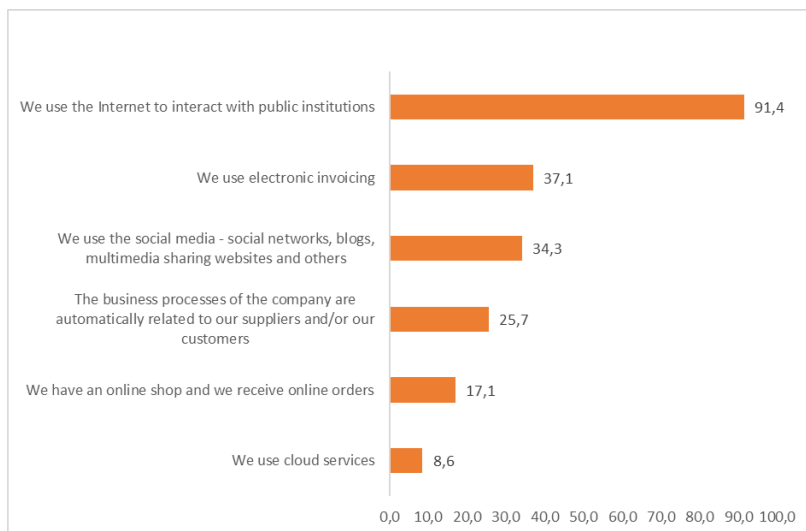
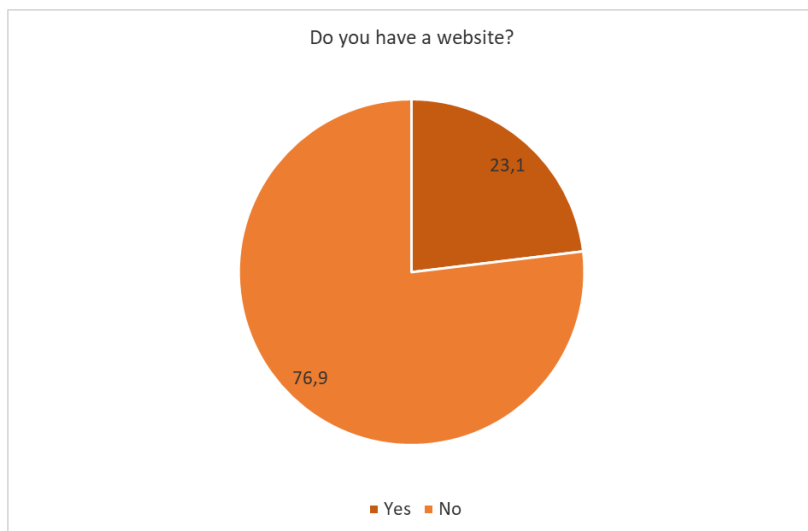


Figure 2.16. If you use the Internet, what do you use it for?



The main usage of the Internet for the companies in the observed sectors is to interact with public institutions (91.4% of the enterprises do so). 37.1% of the businesses in the survey use electronic invoicing and 34.3% use the social media (including social networks, blogs, multimedia sharing websites and others). 25.7% of the entities report that their business processes are automatically related to their suppliers or customers. Online orders through an online shop are received by 17.1% of the enterprises. 8.6% of the companies in the region use cloud services.

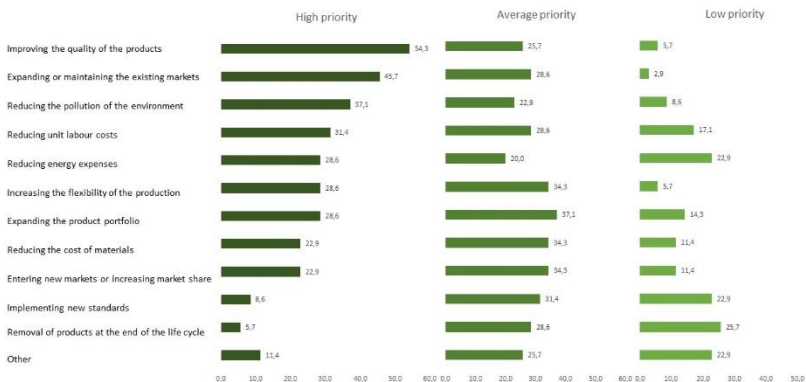
Figure 2.17. Do you have a website?



76.9% of the companies participating in the survey do not have their own website. The online presence of the enterprises might increase their sales and their position on the market.

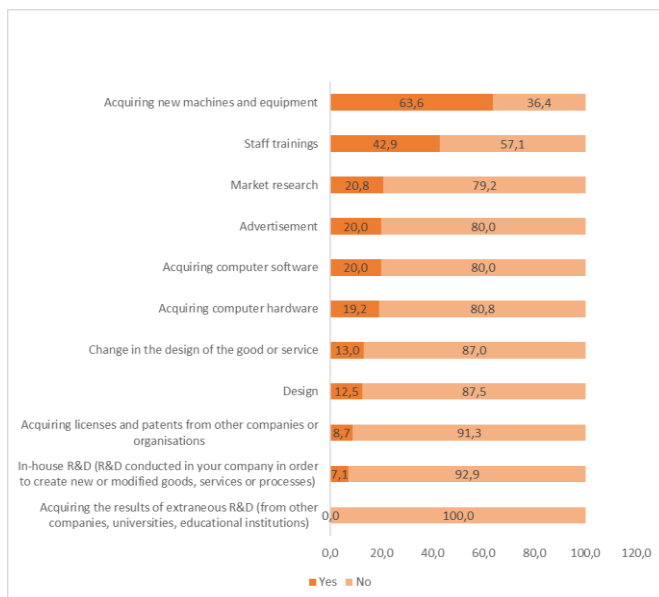
When introducing technological innovations, companies give highest priority to the aim of improving the quality of the products (54.3%), followed by expanding or maintaining the existing markets (45.7%) and reducing the pollution of the environment (37.1%). Lowest priority is given to removing products at the end of the life cycle (25.7%), reducing energy expenses (22.9%) and implementing new standards (22.9%).

Figure 2.18. What are the main aims of the company when introducing technological innovations? What priority are they given?*



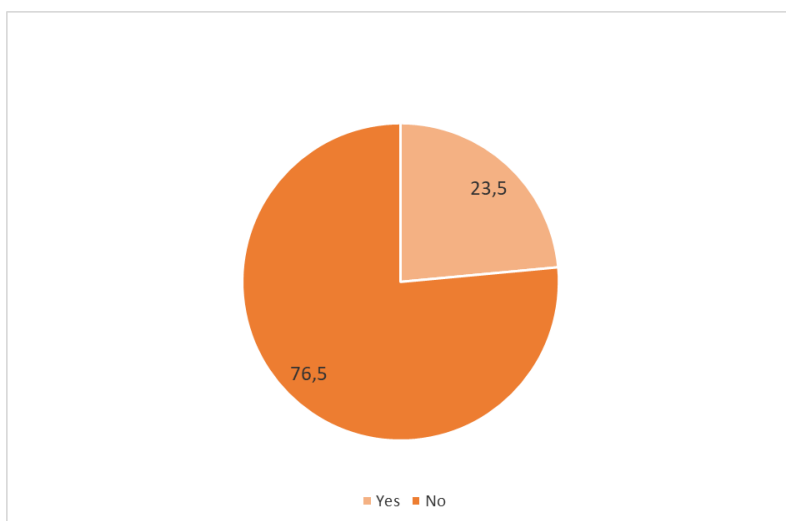
*The difference to 100% for each of the aims is completed by those who give no priority.

Figure 2.19. Has your company invested in any of the following activities in the period 2014-2016?



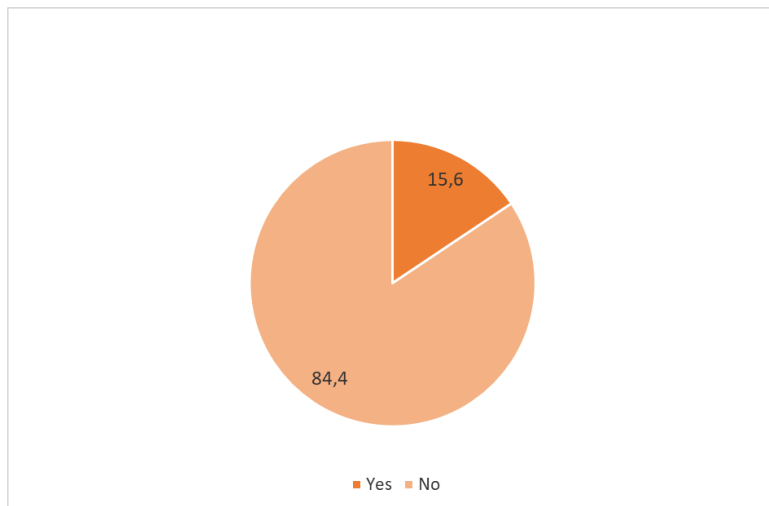
Companies in the observed sectors in the regions of Blagoevgrad and Kyustendil have invested in acquiring new machines and equipment (63.6%), staff trainings (42.9%), market research (20.8%), advertisement (20%) and acquiring computer software (20%) in the period 2014-2016. 91.3% of the enterprises that answered the questionnaire have not acquired licenses and patents from other companies or organisations. In-house R&D was conducted in only 7.1% of the surveyed business entities. None of the enterprises which participated in the survey have acquired the results of R&D coming from other companies, universities or educational institutions. The results from the survey show that the businesses prioritized their investments so as to ensure the efficient functioning of the machinery and equipment and the productivity of the workforce. Obtaining information on the market and advertising were also important to some of the companies, along with acquiring computer software and hardware.

Figure 2.20. Has your company introduced technologically new or modified products in the last three years?



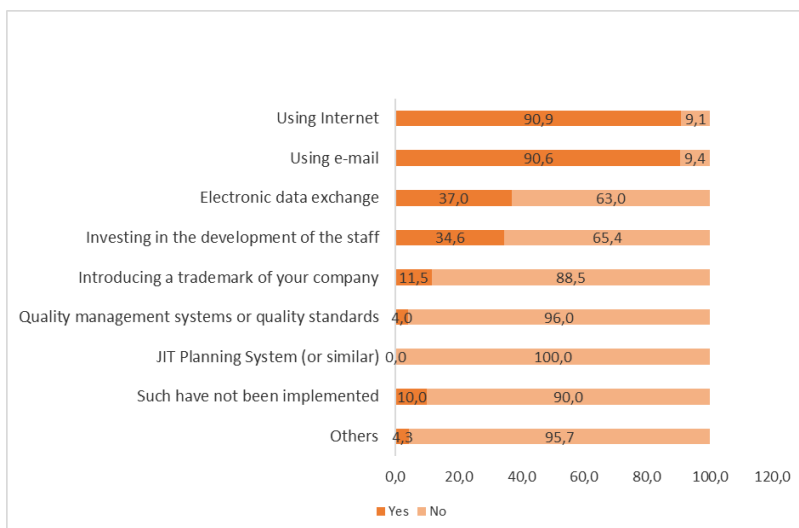
As indicated above, the innovation level in the observed sectors is relatively low. This is shown by the statistics of new product introductions. Technologically new or modified products have been introduced to the market by 23.5% of the surveyed companies in the last three years. The companies that introduced technologically new or modified products have created or modified them themselves (related to Q26 How was the technologically new or modified product acquired).

Figure 2.21. Has your company introduced technologically new or modified products, which are also new to the market, in the last three years?



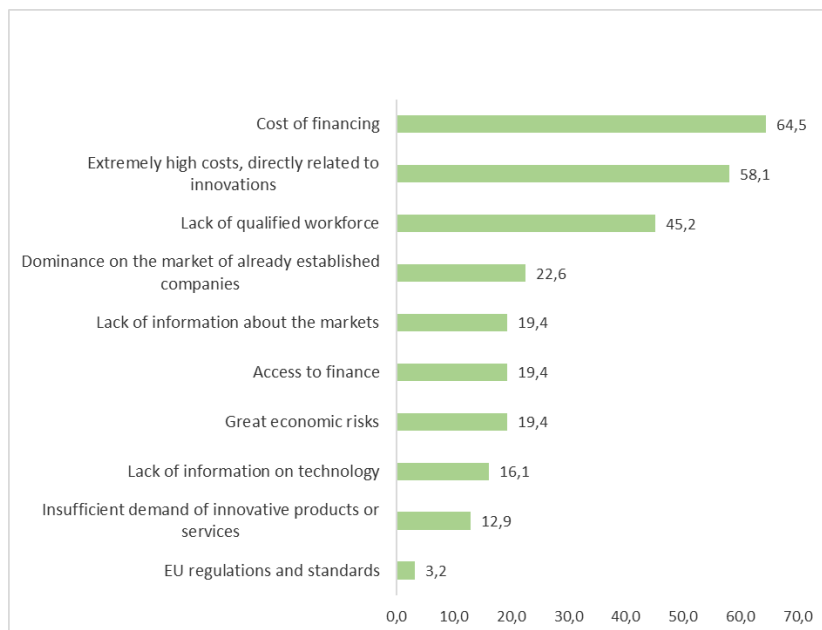
15.6% of the companies which took part in the questionnaire have introduced technologically new or modified products which are also new to the market.

Figure 2.22. Has your company implemented the following organizational changes or new management techniques in recent years?



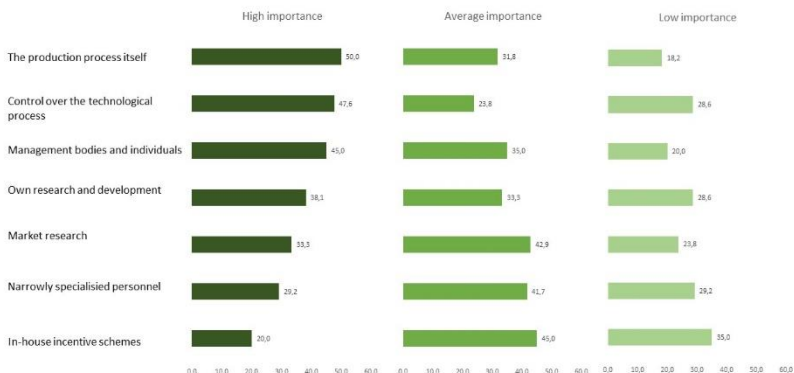
There is a tendency towards digitalizing the organizational processes in the businesses in the observed sectors. 90.9% and 90.6% of the companies that participated in the survey have introduced using the Internet and using e-mail in recent years. Electronic data exchange and investing in the development of the staff were among the other organisational changes implemented by 37% and 34.6% of the enterprises respectively.

Figure 2.23. Which were the obstacles to innovating in your company during the period 2014-2016?



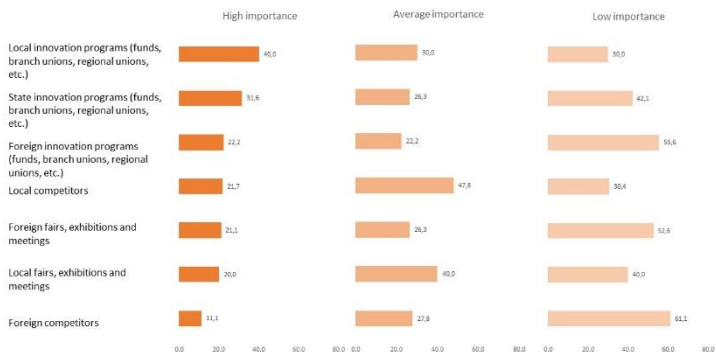
The biggest obstacles which the companies in the observed sectors in the regions of Blagoevgrad and Kyustendil are facing when it comes to innovation are the cost of financing and the extremely high costs directly related to innovations (64.5% and 58.1% of the enterprises respectively point those as the greatest obstacles to them). The lack of qualified workforce is identified as a problem in relation to innovating by 45.2% of the businesses. EU regulations and standards are not perceived as an obstacle by the majority of the surveyed companies (3.2% indicated that these are the biggest obstacles to innovation).

Figure 2.24. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



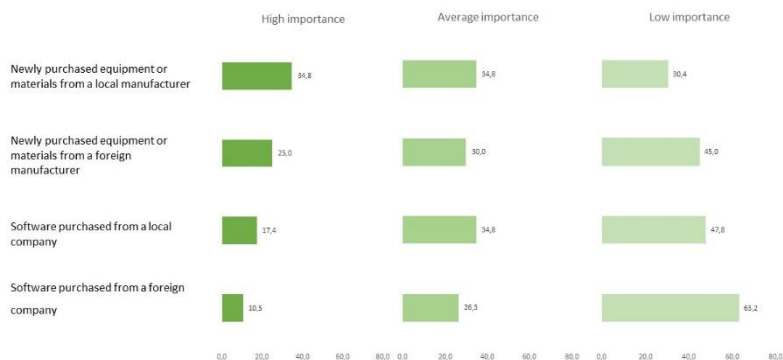
The production process itself (50%), the control over the technological process (47.6%) and the management bodies and individuals (45%) are regarded as the sources of innovative ideas with highest importance to new projects and technological innovations of the companies. Innovative ideas of low importance are in-house incentive schemes, own research and development and narrowly specialized personnel: 35%, 28.6% and 29.2% of the companies respectively pointed out those as factors of low importance.

Figure 2.25. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



Local and state innovation programs (funds, branch unions, regional unions, etc.) are important sources of innovative ideas to businesses. 40% and 31.6% of the surveyed enterprises indicate that those sources of innovative ideas to new projects and technological innovations of the companies are of high importance. Foreign competitors, foreign innovation programs and foreign fairs, exhibitions and meetings are stated to be of low importance when it comes to innovative ideas which are essential to new projects and technological innovations in the companies.

Figure 2.26. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



Newly purchased equipment or materials from local manufacturers are regarded as sources of innovation which are highly important when new projects or technological innovations are developed in companies (34.8% of the companies state that this factor is of high importance to them). On the contrary, newly purchased equipment or materials from foreign manufacturers are seen as factors of low importance, according to 45% of the surveyed businesses. So is software purchased from local companies (47.7% of the enterprises say it is a factor of low importance to new projects or technological innovations) or foreign companies (63.2%).

Foreign customers and suppliers as well as local ones are among the highly important sources of innovative ideas to new projects and technological innovations, as regarded by respectively 38.1% and 37% of the companies. Foreign consulting companies are considered to be of low importance to innovative ideas by 70.6% of the surveyed businesses.

Figure 2.27. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?

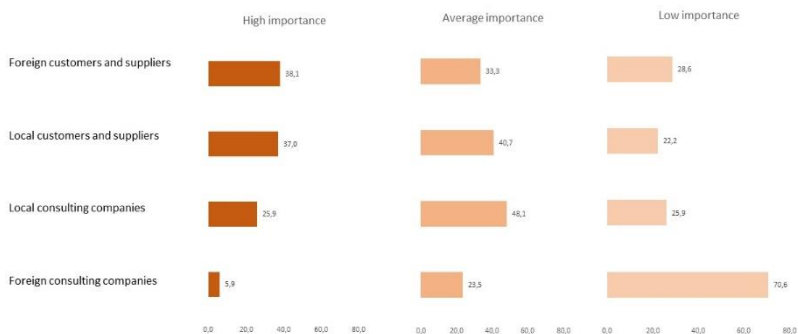
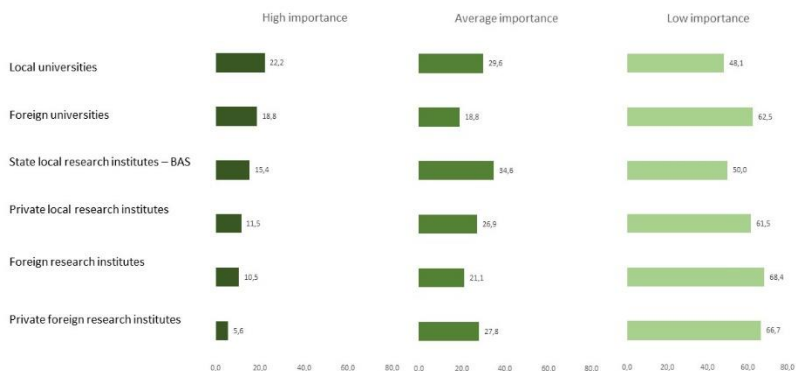
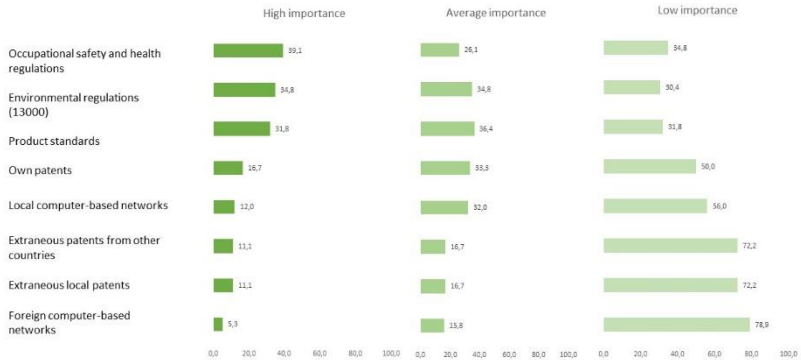


Figure 2.28. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



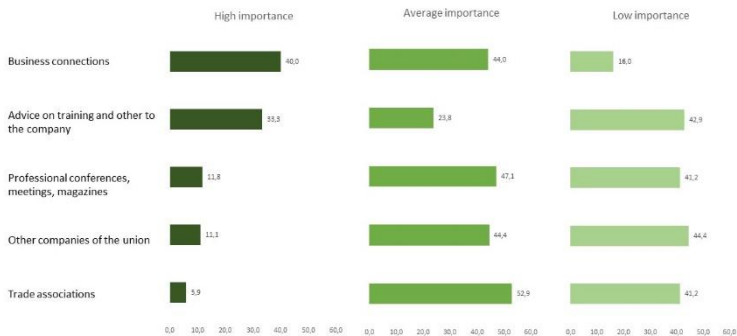
Universities and research institutes are of low importance to the innovative ideas of the companies in the observed sectors in Blagoevgrad and Kyustendil, as pointed out by approximately half of the surveyed companies or more.

Figure 2.29. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



39.1% of the surveyed companies indicated that occupational safety and health regulations are of high importance to the innovative ideas to new projects and technological innovations of the companies. Environmental regulations and product standards were seen as highly important by respectively 34.8% and 31.8% of the businesses. Patents (either own, local or foreign) as well as computer-based networks were regarded as factors of low importance to innovative ideas.

Figure 2.30. To what extent are the following sources of innovative ideas important to new projects and technological innovations of your company?



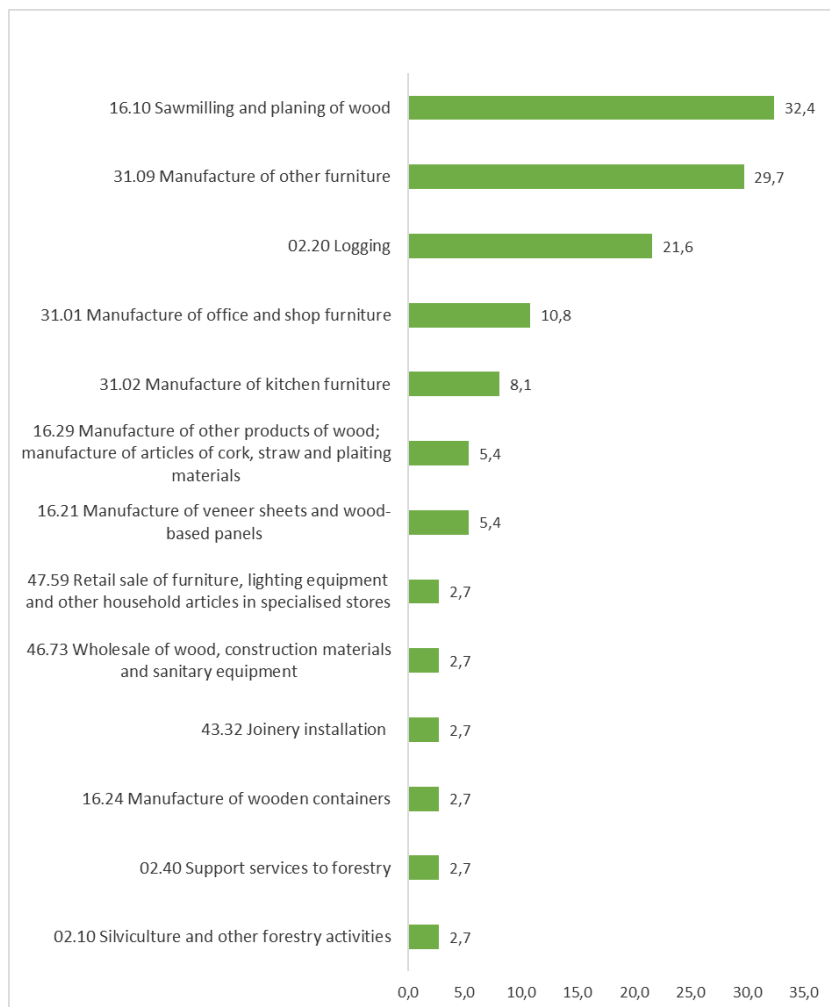
40% of the enterprises state that business connections are a highly important source of innovative ideas and 33.3% share the view that advice on training and other to the company are of high importance to new projects and technological innovations. Approximately 40% of the companies regard professional conferences, meetings and magazines, other companies of the union and trade associations as factors of low importance to innovative ideas.

Presentation of the supply chain

The operations of 32.4% of the companies that participated in the survey fall into the economic activity 16.10 Sawmilling and planning of wood. 29.7% of the businesses are part of the economic activity 31.09 Manufacturing of other furniture under NACE Rev.2 and 21.6% belong to the 02.20 Logging. The activities of the companies in the observed sectors, among others, are also 31.01 Manufacture of office and shop furniture, 31.02 Manufacture of kitchen furniture, 16.29 Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials and 16.21 Manufacture of veneer sheets and wood-based panels.

The majority of the enterprises participating in the survey have local suppliers in the territory of Blagoevgrad and Kyustendil. These suppliers are both private companies and state-owned forest holdings. Private companies supplying forestry firms in the region under consideration range from small and medium to large enterprises, leaders in the country and the Balkans. Some companies receive supplies from the Southwest State Enterprise of the Ministry of Agriculture, Food and Forestry. Although less frequently, companies in the divisions concerned say they have suppliers from Macedonia as well. This means that cooperation in the forestry sector between the two countries is relatively weak. Promoting it could lead to greater productivity of the businesses in the monitored regions.

The clients of the forestry companies in Blagoevgrad and Kyustendil are mainly companies or end-users from the region as well as from the whole country. The businesses that export their products abroad are fewer. Most often, exports from the areas under consideration are to neighboring countries, with most of the respondents saying they are exporting the production to Macedonia and Greece. There are also organizations that export to other European countries (Italy) and Asia (China and South Korea).

Figure 2.31. Economic activity of the companies surveyed under NACE Rev. 2

Cooperation with customers, suppliers and others

10.8% of the companies in the observed sectors in the regions of Blagoevgrad and Kyustendil have customers in Macedonia and 2.9% of the surveyed have suppliers from Macedonia. That numbers might be increased when the cooperation between the border regions of the two countries is stimulated.

Figure 2.32. Do you have customers and/or suppliers from Macedonia?

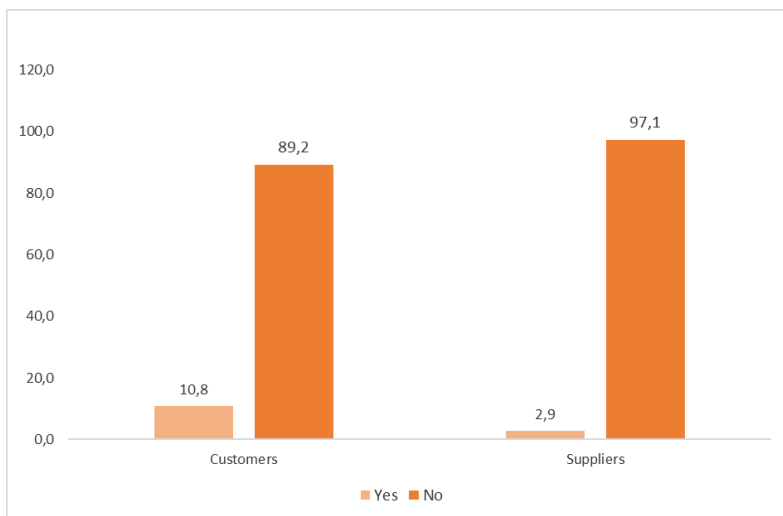
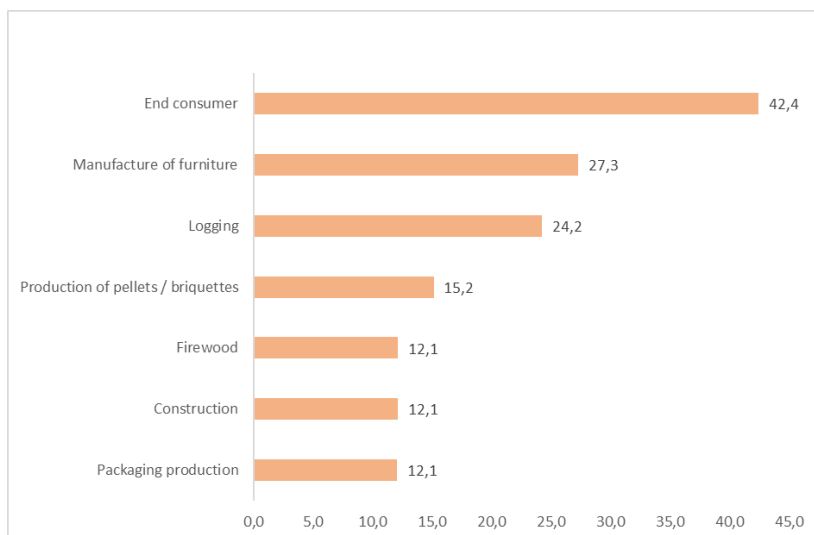


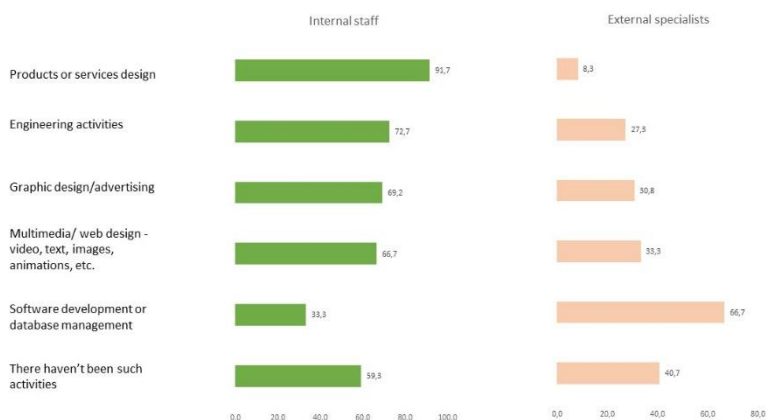
Figure 2.33. In which of the following categories fall your customers?



42.4% of the businesses in the observed sectors in Blagoevgrad and Kyustendil produce to satisfy the needs of end consumers. 27.3% of the enterprises supply their

products to manufacturers of furniture, 24.2% - to logging companies and 15.2% - to those producing pellets or briquettes. Equal proportions (12.1%) of the surveyed business entities have customers which fall into the categories of producers of firewood, construction or packaging production.

Figure 2.34. During the last three years what specialists have been occupied with the following activities?



Activities which are typically performed internally in the companies of the observed sectors and regions are the design of products or services (in 91.7% of the enterprises), engineering activities (72.7%), graphic design and advertising (69.2%) and multimedia or web design (66.7%). Software development or database management activities are usually done by external specialists (according to 66.7% of the surveyed companies).

51.7% of the companies in the observed sectors buy logs from their suppliers, 24.1% buy veneer, 20.7% get supplies of wood slabs and another 20.7% - of boards and beams. 6.9% of the surveyed businesses point out that they only buy finished products.

Figure 2.35. What kind of materials does your company buy from suppliers?

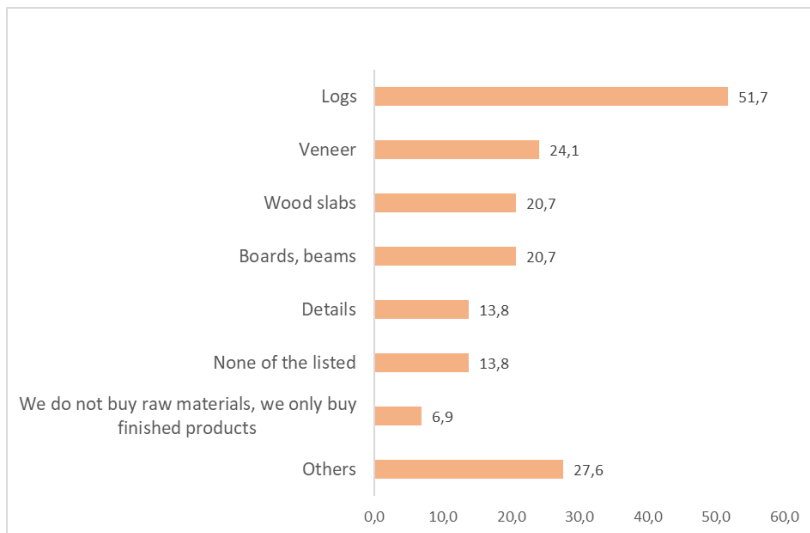
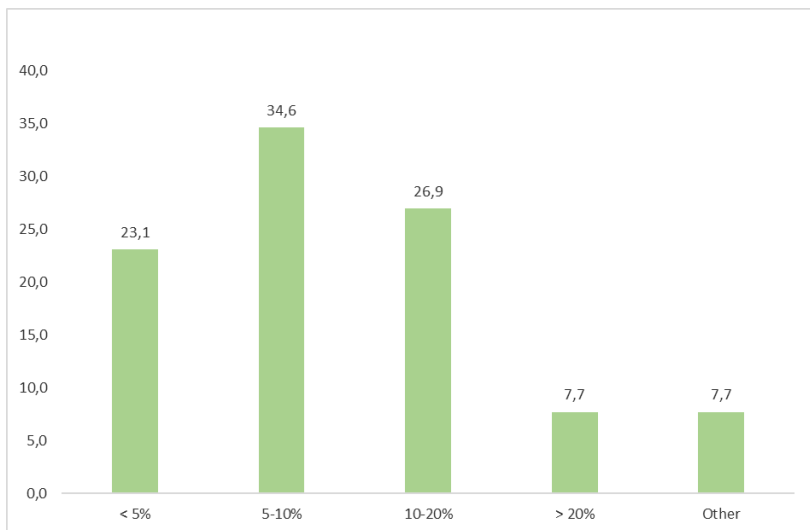
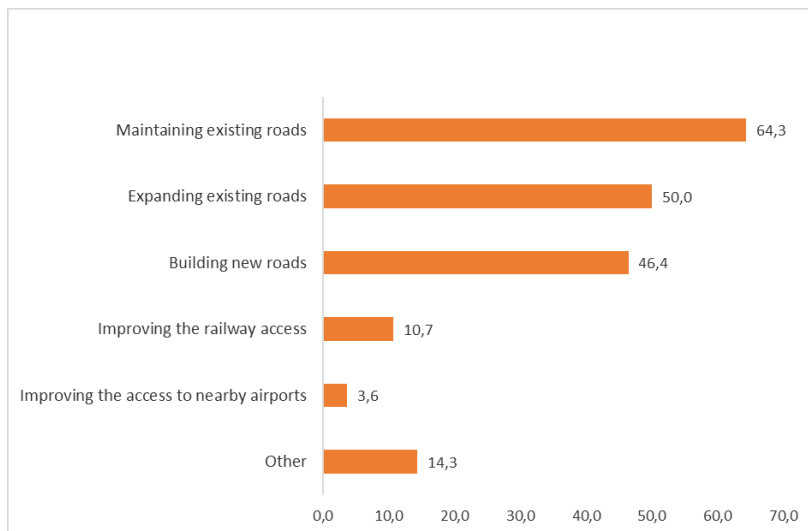


Figure 2.36. Delivery costs out of the total production volume



34.6% of the companies which took part in the survey responded that their delivery costs equal 5 to 10% of their total production volume. According to 26.9% of the businesses the delivery costs are about 10 to 20% of the total production volume and 23.1% of the enterprises state they are less than 5% of their production volume.

Figure 2.37. Which of the following infrastructural projects would support the operation of your company?



64.3% of the companies in the observed sectors state that maintaining the existing roads would support their operations. Half of the surveyed enterprises point out that the expansion of the existing roads would contribute positively to the operations of the company. Additionally, 46.4% of the businesses believe building new roads would foster their performance.

More than half of the surveyed companies indicate that if they had access to a virtual educational platform, they would search for information on new technologies, new markets, innovations in production, potential markets and suppliers. Information about fairs and exhibitions, new raw materials, cooperation and networks and new products would be searched for as well. The enterprises pointed out that they would least search for ICT innovations in such a platform.

Figure 2.38. If you had access to a virtual educational platform, what information would you search for?

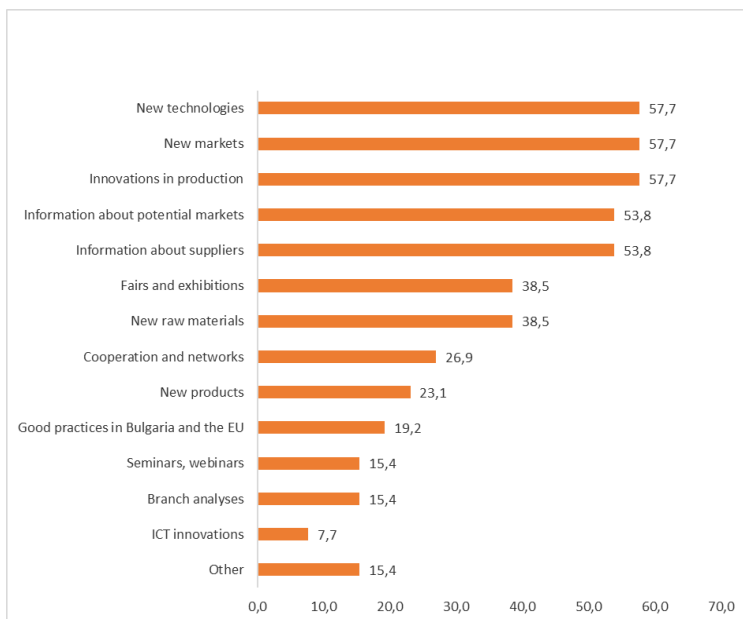
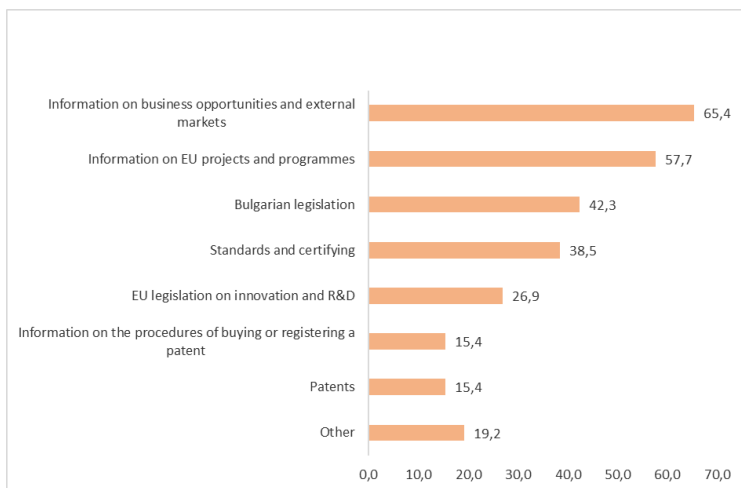
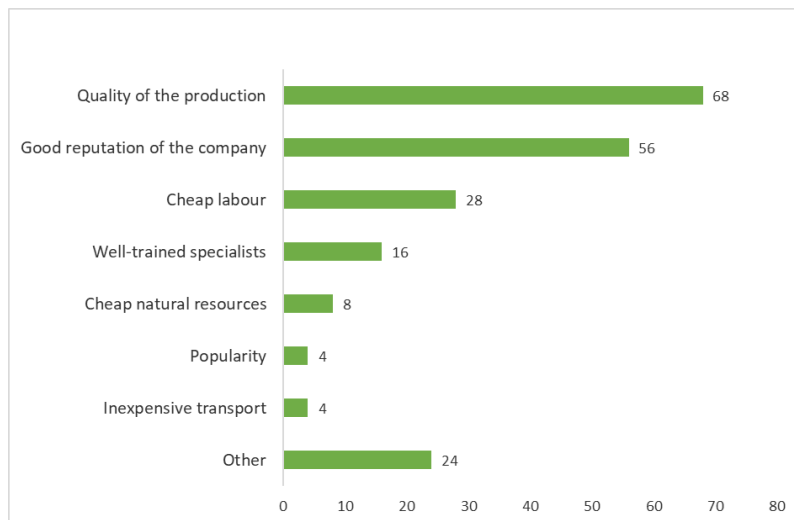


Figure 2.39. If you had access to a virtual consulting office, what information would you search for?



A virtual consulting office would help the majority of the companies in their search for information on business opportunities and external markets, EU projects and programmes, Bulgarian legislation and standards and certifying. Patents and the procedures of buying or registering a patent are among the topics of least interest to the companies in the observed sectors in Blagoevgrad and Kyustendil.

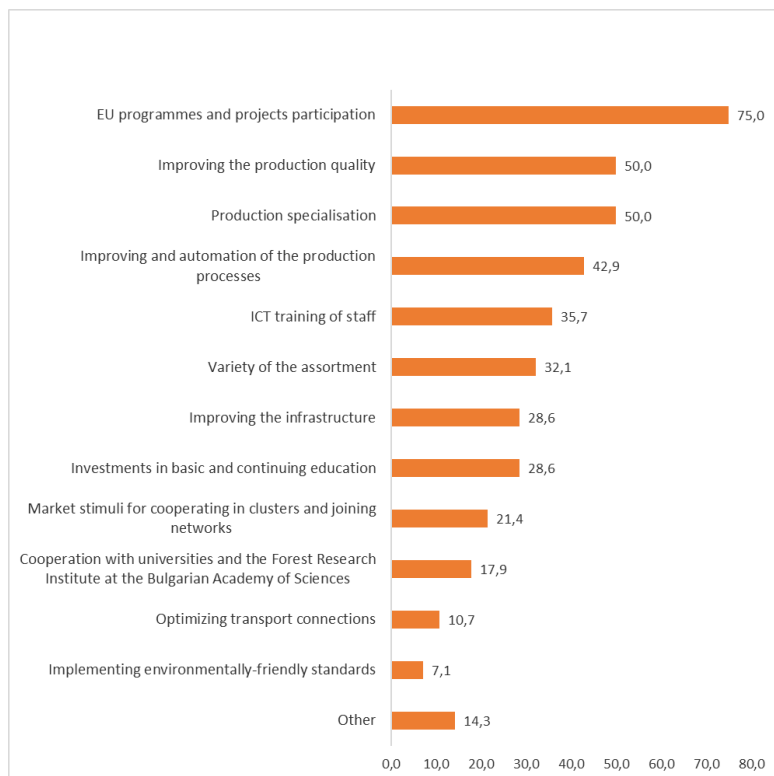
Figure 2.40. What do you think your competitiveness is based on?



68% of the companies that participated in the survey state that their competitiveness is based on the quality of their production and 56% of them regard the good reputation as a factor which makes them more competitive. The cheap labour is what stands behind the competitiveness of 28% of the surveyed companies, according to their staff. The well-trained specialists, the cheap natural resources, the popularity of the company and the inexpensive transport are not seen as competitive advantages by the enterprises in the observed sectors.

When it comes to competition on the local market, 39.3% of the enterprises regard it is neither strong nor weak. Thus, people in the observed sectors are inclined to believe that the power of competition of medium strength. 35.7% of the companies state that their competitors locally are strong and 25% - very strong.

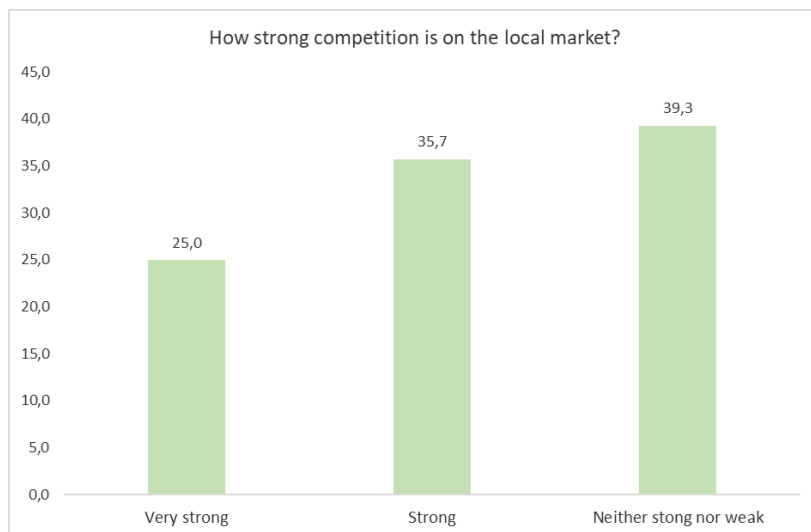
Figure 2.41. What suggestions would you make to increase the competitiveness of the forestry and logging enterprises in regional aspect?



In order to identify what could enhance the competitiveness of the observed sectors in the regions of Blagoevgrad and Kyustendil, the survey studied the suggestions of the respondent companies. Most important to improving the regional competitiveness of the forestry and logging enterprises is the participation in EU programmes and projects. 75% of the organisations share that view. Half of the surveyed businesses state that the quality of the production should be improved and that production should be specialized. 42.9% of the entities respond that the production processes should be improved and automated in order to increase the competitiveness of the forestry and logging sectors in the regions of Blagoevgrad and Kyustendil. ICT training of the staff and a more varying assortment of products are believed to foster the competitiveness as well. Optimizing the transport connections and the implementation of

environmentally-friendly standards are seen as the factors which would contribute the least to companies becoming more competitive.

Figure 2.42. How strong competition is on the local market?



2. Innovation and Competitiveness in Forestry Sector in Northeast, East and Southeast Planning Regions of Macedonia (Results of a Survey in 2017)

The project “Innovative initiatives for cooperation in the cross-border region” comes from the IPA program for cross-border cooperation of the Republic of Macedonia and the Republic of Bulgaria (2014-2020), co-financed by the European Union. The Project foresees several activities in the different phases of the realization of the project. One of those activities is implementation of field survey titled “Determining of initiative for innovative cooperation – in the Blagoevgrad and Kyustendil region from Bulgaria and the Northeast, East and Southeast planning regions of Macedonia”.

The purpose of the implemented survey is to promote competition and cross-border cooperation through determining:

- a) initiatives for innovative cooperation among the forestry enterprises of Blagoevgrad and Kyustendil district in Bulgaria with the Northeast, East and Southeast planning regions of Macedonia
- b) barriers and opportunities for their overcoming

c) ideas for increasing productivity, growth and investments in the region.

With the purpose of correct implementation of the survey from the Macedonian side, firstly an analysis was proceeded of the conditions in the forestry sector and logging industry. The acquired results show that the forests in the researched regions of the Republic of Macedonia are dominantly state owned, around 90% of the surface is state owned whereas the remaining surface area of around 10% are privately owned. We also have similar dependence in relation to the wood mass that we have in the state forests in relation to the private forests.

The state owned forests in the Republic of Macedonia are managed by the Public Enterprise Macedonian Forests. The employees in this enterprise perform all expert activities in the state forests. A larger part of the activities from manufacturing are given to the private companies (contractors) with whom a contract is agreed for processing work through previously processed public tenders. The activities are given individually in the following phases: logging, loading and transport of wood assortments in terms of one chamber or one subdivision.

Smaller amounts of wood mass are given as wood on square root, with the purpose of supplying firewood for the local population.

Private forest owners realize their right to produce and trade in timber assortments in accordance with the Law on Forests. It stipulates the methodology and the manner of using the private forests. Private owners can use their right to production through: special plans for forest management (over 30 ha), forest management program (for forests with smaller surface area) and annual use in private forests in which it operates according to prescribed criteria for logging in private forests and control by P.E. Macedonian Forests.

The logging industry in the Republic of Macedonia supplies itself with raw material most often from the state suppliers (dominantly P.E. Macedonian Forests).

The processing of wood assortments is done in sawmills in the following phases: primary processing, secondary processing and final processing. In our practice, products are made in all three phases with the purpose of satisfying the part of the domestic needs whereas a part of the products ends up on the foreign markets. The products from primary and secondary production are processed in accordance with the standards for quality or by specification from the orders. The biggest expansion in the sector is in the part of processing of composite materials and production of furniture and interior. Very important factors in the production of final products are quality, design and marketing of the product, activities in which Macedonian companies have a vast field of work and improvement.

Having in mind this structure of placement of the companies in the forestry sector and logging industry we came towards the realization of this survey, in the meantime having

in consideration to include various subjects with varying structure from all phases of production.

Region of research

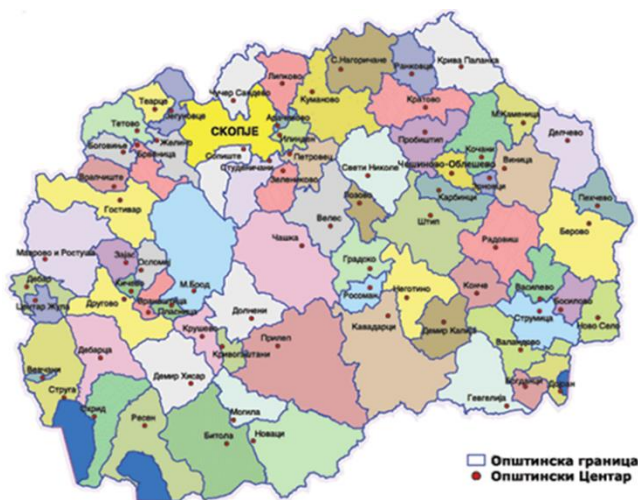
In the project, the areas or regions that are subject to cross-border cooperation between the Republic of Bulgaria and the Republic of Macedonia are defined. From the side of the Republic of Bulgaria the Blagoevgrad and Kyustendil regions are included whereas from the side of the Republic of Macedonia the Northeast, East and Southeast planning regions of Macedonia are included.

In these regions of the Republic of Macedonia, there are several municipalities, but as bigger centers in which there is organized forestry (affiliations of P.E. Macedonian Forests) as well as bigger capacities of the logging industry are the following:

- Northeastern region: Kriva Palanka, Kratovo and Kumanovo
- Eastern region: Delchevo, Pehcevo, Berovo, Vinica, Kocani and Stip
- Southeastern region: Radovis, Strumica, Gevgelija and Valandovo

The figure below illustrates the municipalities in Republic of Macedonia.

Figure 2.43. Municipalities in Republic of Macedonia



Administrative data about the companies that are registered for work in the chain of wood production are taken from the Central Registry of the Republic of Macedonia.

According to this data: in the Northeast, East and Southeast planning regions a total of 753 legal entities of these activities are registered. This number of legal entities does not equal with the active companies in the forestry sector and the logging industry because part of the legal subjects are insolvent or in bankruptcy procedure. Part of the companies are in repose or do not have business activity. In addition, large part of the legal entities during registration of the subject state several activities, and some of the registered activities do not perform in practice at all.

The companies included in this survey are targeted in cooperation with P.E. Macedonian Forests and 12 affiliates (forestry managements) who manage with the state forests in the cross-border regions. Targeted are the companies that process or perform expert services (logging, delivery, transport) for the needs of P.E. Macedonian Forests). The number of active or partially active companies-contractors of P.E. Macedonian Forests in the researched region is 52. Companies that buy the technical wood mass and perform primary processing of wood (sawmills) are around 48, with varying size and capacity for production.

Specially included and targeted are companies that perform secondary processing of wood, final processing of wood, companies that make furniture and interior and others. Active companies in this group according to the free assessment are about 20 major legal entities and a larger number of small legal entities with fewer or one employee.

With the survey, "Determining of initiatives for innovative cooperation" a total of 89 companies are included. Surveyed are companies with different range in terms of number of employed, economic power of the companies, varying activities in relation to production of wood, processing of wood and wood products.

Purpose of the survey

The basic purpose of the survey is to provide an answer of the set thesis and goals of the project "Innovative initiatives for cooperation in the cross-border region". The project is in connection to the IPA program for cross-border cooperation 2014-2020. The forestry sector and logging is determined as potential in which much can be achieved in terms of: competition, logistics in the exiting market, finding new markets, instruction and training for the employed, finding of new technologies and other.

The potential of the forestry sector is large and significant both for the region and for the European Union, especially if it is known that the production of wood is a sustainable source of energy and is categorized in so-called green energies. Hence, it is very important to know the potential of the forests that we have in the region, as well as the measures for increasing and improving the quality of forests. In the future we must stick to the basic principles of forestry for permanent and increased production, based on ecological principles.

The project aims to stimulate the exchange of knowledge, new ideas and opportunities related to the protection of the environment and the sustainable use of natural resources, i.e. the forest. In addition, the project should stimulate the activities for scientific and applicative research and to promote European values and experiences in this field.

The project is intended to offer an educational and training platform through a virtual office, which would be available at all times and anywhere for all project participants as well as for all stakeholders and people working in the forestry sector. This office should also support the business network of forestry and timber industry entities.

The virtual office in one word should contain all databases for the condition and activities in the sector.

The goals of the project placed like this should contribute for inclusive cross-border development and make these regions a better place for living and work.

During the implementation of the survey the technical goal for inclusion of as much as it is possible companies that work in forestry and logging and wood products was made. The intent was to include different companies by size and activity with which the relevant and further applicable results would be attained. From the results of the project it is expected to give a real picture of the condition of the sector, with which the creation of an appropriate policy would be possible. The additionally acquired results have the goal of determining all needs for improvement of the connections between the companies from the sector in the two neighboring countries and on that way to build permanent bridges of cooperation and friendship.

Structure of the questionnaire

Experts included in the project from various areas model the structure of the questionnaire. The total number of questions is 48, questions 1 to 6 are basic questions in relation to the companies and the surveyed persons, and questions 44 to 48 are questions for identification and contact of the surveyed persons as well as data for the companies that are included in the survey.

The expert part of the survey is comprised of four groups of questions:

1. Basic information and characteristics of the activity of the company (questions 6 to 22)
2. Innovative activity of the company (questions 23 to 39)
3. Markets and procurement (questions 33 to 39)
4. Development and competition (questions 40 to 43)

Findings of the survey

The findings of the survey are given as a narrative display of the acquired results for all four groups of expert questions.

Basic information and characteristics of the activity of the company

In this group the questions include much more questions about the character of the surveyed companies as well as questions that are connected to the surveyed persons.

- On the answer of the gender of the surveyed persons, 82% answered that they are male whereas 16% answered that they are female. 1% of the surveyed persons did not answer this question.
- The age of the surveyed persons is between 29, of the youngest, and over 50 of the oldest surveyed person. The dominant group of age at the surveyed persons is between 40 and 50 years. A high 14% of the surveyed persons did not answer this question.
- Regarding the education of the surveyed persons, persons with secondary vocational education dominate with 40% and there are 33% with higher education. Only 8% of the surveyed persons are with elementary education.
- 89% of the surveyed persons are managers of the companies. 7% of the surveyed persons are assistant experts, 1% are assistant administrative staff, 1% are qualified workers and 2% of the surveyed persons did not answer this question.
- The field survey was made in all larger centers in the cross-border region of the Republic of Macedonia towards the Republic of Bulgaria. A total of 89 companies were surveyed. The most surveyed companies came from Strumica, 17, and the following were: Kumanovo 12, Pehcevo 8, Gevgelija 8, Radovis 7, Berovo 7, Vinica 7, Delcevo 6, Valandovo 5, Kocani 3, Kriva Palanka 3, Kratovo 2, Skopje 1 (works in the region) and one company in Stip. Two subjects did not answer this question.
- The surveyed firms are established in different periods of time: after 2010 established are 19%, from 2000 to 2010 established are 29%, from 1990 to 2000 established are 15% and up until 1990 established are 3% of the surveyed companies. 33% of the companies did not answer this question.
- The ownership of the companies according to the capital is dominantly private with a high 84% of the surveyed companies. 14% of them are state owned. There is none at all mixed ownership of the capital in the companies, and 2% of the surveyed companies did not answer this question.

- The ownership of the companies according to the place of registration dominantly is Macedonian, 94%, and mixed ownership have 2% of the companies. 1% of the companies are foreign. 2% of the surveyed companies did not answer this question.
- The legal status of these companies is different. Here dominate companies with limited liability 51%, independent associations with limited liability 16%, limited associations 2%, sole proprietors 3%. Having in mind that the option of public enterprise was not offered, 18% filled in the rubric „other“. 2% did not answer this question. Independent companies dominate this survey with a high 92%.
- The surveyed companies were largely active in the last three years (2014, 2015 and 2016), of them 85% of the surveyed companies. The rest were inactive or did not provide an answer.
- The size of the companies is analyzed according to the part of the financial indicators as well as the number of employees in the company.
- According to the balance sheet of the assets dominate companies with assets up to 350.000.00 euros or 68% of the surveyed companies, companies with assets from 350.000.00 to 4.000.000.00 euros are 17% of the surveyed, companies with assets from 4.000.000.00 to 19.000.000.00 euros have 7% of the surveyed companies and assets over 19.000.000.00 are 2% of the surveyed companies. 4% of the surveyed companies did not answer to this question.
- According to the net income from sales a categorization is made on the companies in the following classes: companies that have income from sales up to 700 000.00 euros, that is 75% of the surveyed companies, from 700.000.00 to 8.000.000.00 euros are 6%, from 8.000.000.00 to 38.000.000.00 euros net income from sales have 8% of the surveyed companies.
- According to the number of employees in the companies the following separation is made: from 1 to 9 employees have 62% of the surveyed companies, from 10 to 49 have 19%, from 50 to 249 have 12% and over 250 employees have 3% of the surveyed companies. 2% of the surveyed companies did not answer this question.
- On the question of the invested funds for research and development of the surveyed companies a high percentage of 54% answered that for these purposes they have not made any expenses, from 0 to 0,3% expenses for these activities invested 30% of the companies, from 0,31 to 0,5% invested 11% and over 0,5% of the expenses for research and development invested 2% of the surveyed companies. 2% of the surveyed companies did not answer this question.
- Export as an item of the total turnover of the surveyed companies is classified in the following categories: companies that have export up to 20% positively answered 71% of the surveyed companies, category from 21 to 49% positively

answered 3%, category over 50% positively answered 7% of the surveyed companies. On this question 19% of the surveyed companies did not answer.

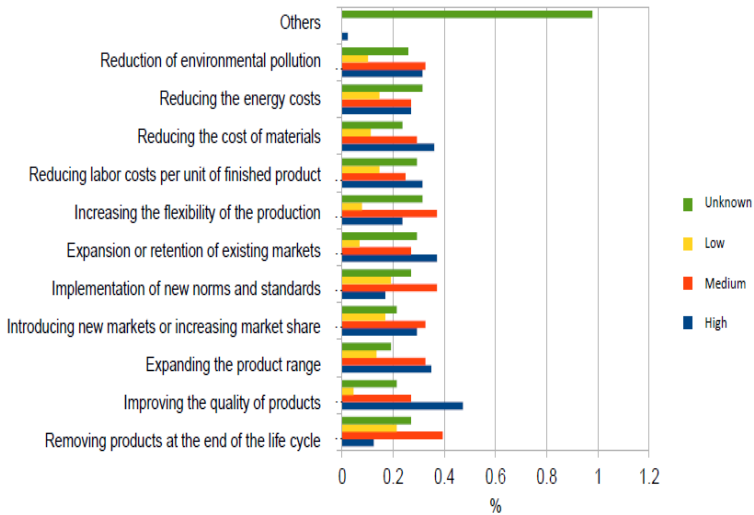
- The surveyed companies have computers in their working activities, 72% of them, and 67% of the surveyed companies use internet. The rest of the companies either do not use it or did not answer this question. The internet is most often used for: interaction with the public enterprises, using electronic invoices, using social media as well as for organization of the website of the company. A large percentage of the surveyed company, 49% of them do not have a website where as 33% do. 18% of the surveyed companies did not answer this question.
- The companies' activities are classified according to the code of the NACE 2008. According to this classification, companies with different activities are surveyed, such as: 6% forestry management, 20% logging, assistance activities in forestry 15%, planning and impregnation of trees 6%, production of wood and wooden pallets 12%, production of assembled parquet boards 4%, production of carpentry and other wood products for construction 2%, production of wood packaging 6%, production of furniture for offices and stores 5%, production of kitchen furniture 2%, production of mattresses and sponge 1%, production of other furniture 5%, trade and wood and construction material management 12%, trade and management with furniture 0%, hardware and metal processing 2%, wholesale trade of timber 0%, construction material and sanitary equipment 2%, trade and management with wood and construction material 1% and the activity of retail trade of wood with furniture, lighting and other household goods 1%.
- Regarding the cooperation of the surveyed companies from the Republic of Macedonia with companies from the Republic of Bulgaria two questions are analysed, such as: do you have clients and suppliers from the Republic of Bulgaria. Regarding the question about clients affirmatively answered only 10% of the surveyed companies whereas negatively answered 83% and 7% did not answer. For the second question of do they have suppliers from the Republic of Bulgaria positively answered 15%, negatively answered 79% and 7% of the surveyed companies did not answer.
- The companies-suppliers from the Republic of Bulgaria are active in the following fields: logging 29%, furniture production 15%, construction 12%, packaging production 9%, production of packaging 1%, palette production 9%, firewood 12% and end users 14%.

Innovative activity of the company

In this group ten questiond are given in the area of innovative activity of the companies that are surveyed.

- What are the company's main goals when introducing technological innovations?
What is the degree of priority?

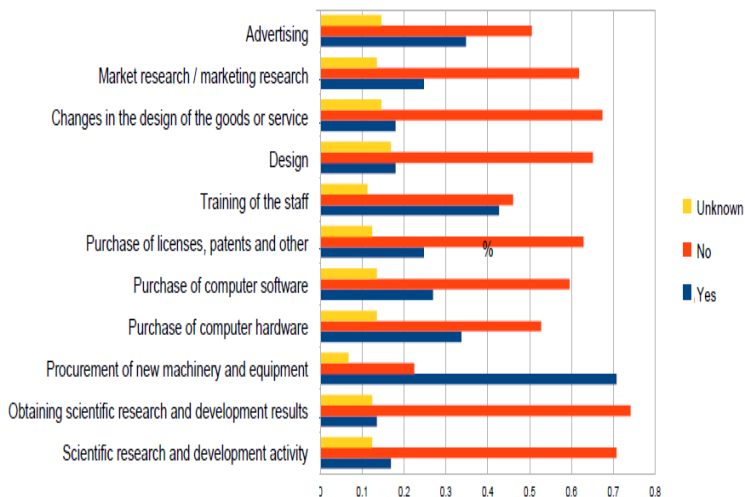
Figure 2.44. What are the company's main goals?



A complex question is made with determining of priorities for the question what are the basic goals of the company during the introduction of technological innovations, and several subquestions are offered with the answer for the degree of priority (high, middle and low). The subquestions regard: removal of products at the end of the life cycle, improvement of the quality of products, expansion of the production assortment, introduction of new markets and increasing of the market share, executing new normatives and standards, expansion or keeping of existing markets, increasing of flexibility of production, lowering of expenses for labor per unit of ready product, lowering of expenses for materials, lowering of expenses for energy, lowering of environment contamination and other options. At all subquestions the dominant answer is the middle or high priority whereas a very little percentage of answers pertain the low priority.

- In the period from 2014 to 2016, did your company invest in any of the following innovative activities?

Figure 2.45. Did your company invest in any innovative activities?



In the time period from 2014 to 2016 part of the surveyed companies invested in: in scientific research and developmental activity 17% of the surveyed firms invested in, investments in obtaining the results from scientific research and developmental activity have 13% of the surveyed companies, procurement of new machines and equipment a high 71% from the surveyed companies, procurement of computer hardware 34%, procurement of computer software 27%, procurement of licences, patents and other from companies or organizations 25%, training of the staff 43%, design 18%, changes in design of goods or services 18%, market and marketing research 25% and advertising 35% of the surveyed companies. From the survey, it is concluded that it has been invested in procurement of machines and training for employees the most, as well as advertising as priorities that are set by the companies. The percentage also of companies who did not invest in the mentioned innovative activities is big.

- Has your company introduced technologically new or improved products in the last three years?

Regarding the question whether technologically new or improved products in the past three years are introduced in your company, affirmatively answered 48%, negatively answered 43% and 9% of the surveyed companies did not provide an answer. Also 43% of the companies that answered affirmatively about the innovations they made in

the frame of their own company, 35% of the innovations they made with the help of other companies and institutions, and 22% with partial cooperation of other companies and institutions.

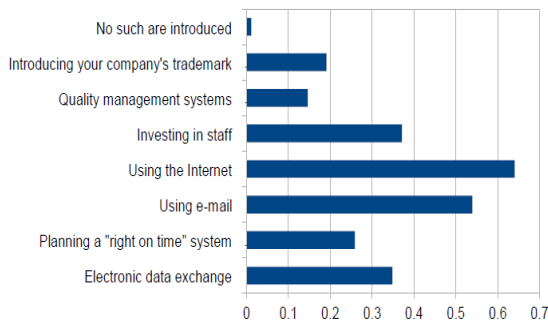
- In the last three years, does your company introduce new or improved products that are new to the market?

In the last three years, part of the companies introduced new or improved products. 36% of the surveyed companies made that. The rest did not follow this trend or did not answer the question.

- In recent years, are the following organizational changes or new management techniques introduced in your company?

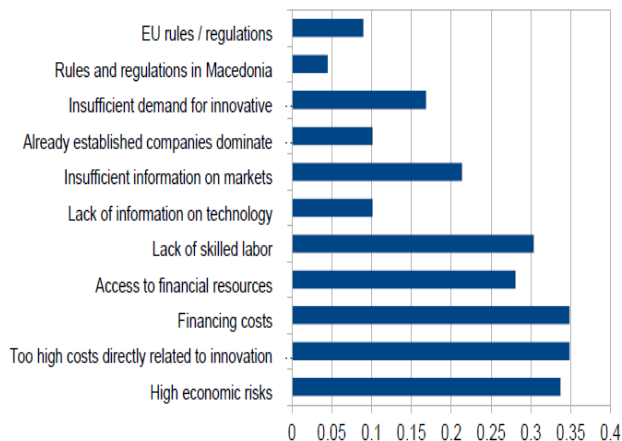
When asked whether the following organizational changes or new management techniques in your company have been introduced in recent years, more sub-questions have been offered on the following positive answers: management techniques responded positively to 25% of surveyed companies, electronic data exchange 26%, time-based planning or similar system 26%, use of e-mail 54%, internet usage 64% answered positively, investing in staff 37%, quality management systems and / or standards 15% and the introduction of a trademark of your company 19%. The remaining percentage of the responses are negative or there is no response at all to the question asked.

Figure 2.46. Management techniques



- In the three-year period from 2014 to 2016, what were the obstacles to achieving the innovation activities in your company?

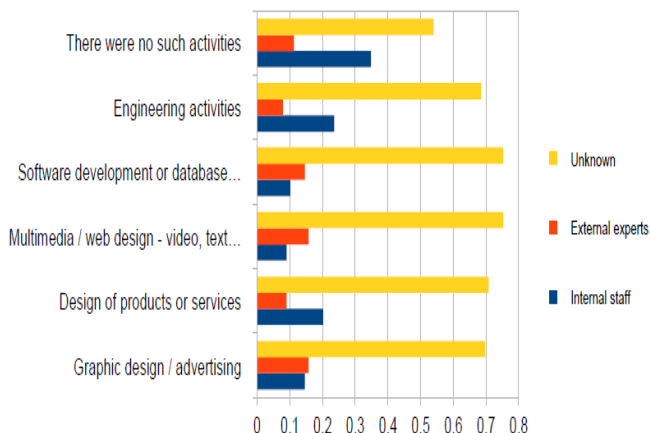
Figure 2.47. Obstacles



In the three-year period 2014-2016, the obstacles in the realization of the innovative activities in the companies are located in: high economic risks responded positively 34%, too high costs related to innovations 35%, financing costs 35%, access to funds 28% shortage of skilled labor 30%, lack of information on technology 10%, insufficient information on markets 21%, In the market dominated by already established companies 10%, insufficient demand for innovative products and services 17%, regulations / regulations in R. Macedonia 5%, EU regulations / regulations 9%. To a large extent, the companies did not answer this question or did not find obstacles in the offered answers for realization of new innovative activities.

- In the last three years, what kind of personnel have been used for the following activities?

Regarding the questions about from what kind of staff the following activities were performed: graphic design and commercial material, design of products and services, multimedia and web design, making of software or database management, engineering activities, the most common answer is with internal staff. A large percentage of the surveyed did not have such activities. A high 70% of the surveyed did not answer this question.

Figure 2.48. What kind of personnel has been used for the following activities?

- What kind of material does your company buy from suppliers?

On the question of what kind of material your company procures for the suppliers, the surveyed companies gave the following answers: wooden logs 29%, bboards and beams 11%, veneer 10%, details 9%, other products 26% and 14% do not buy.

Markets and procurement

In the survey questions their place also take questions connected to the market as well as the procurement of products. This group of questions has been elaborated with seven specific issues in this field.

- Who and from where are your suppliers?

About the question where the suppliers to the surveyed companies are, for the region and the Republic of Macedonia the most common answer of the surveyed companies is the place of activity of the company itself and a small percentage get their needed materials and raw materials from the neighboring cities. The procurement of machines and equipment is done on the Macedonian and world market. Procurement of materials and raw materials from the neighboring regions in the Republic of Macedonia perform

a very small and limited number of companies. A large percentage of the companies do not have an answer to this question.

Regarding locating the clients and users of services, the largest part of the surveyed companies answered that they have local users. Only a small part of the users are located in the neighboring cities in the region. It can be very clearly stated that the percentage of users of products in the cross-border region of the Republic of Bulgaria is small.

- Please indicate approximately how much of the production is transported by rail

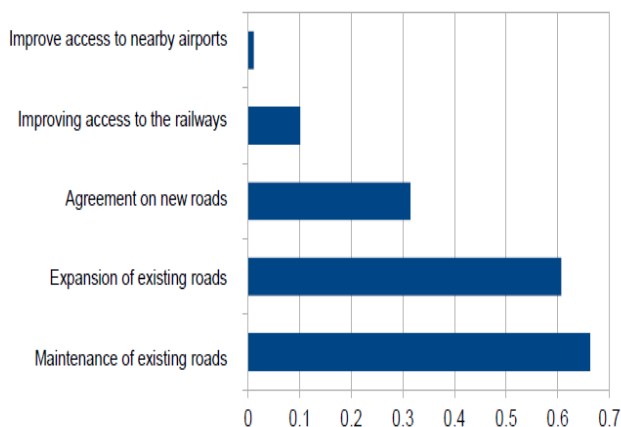
Regarding the question how much percentage of the products was transported by railway positively answered a very small percentage of the questioned companies, which is very understandable if the bad condition of railway traffic in the Republic of Macedonia is taken into consideration and the disconnectedness of the region with neighboring Republic of Bulgaria. Only these cities are connected via railway: Veles, Stip, Gevgelija and Kocani.

- Please indicate your shipping costs of the total production volume

With the purpose of making an analysis of the expenses for delivery of products a classification of the companies in the following classes is made: companies where in the expenses for delivery the participate up to 5% - positively answered 18%, from 5 to 10% - positively answered 19%, in the class from 10 to 20% - positively answered 26%, and with the same 26% positively answered the companies in the class of expenses larger than 20%. On this question 11% of the surveyed companies did not answer.

- Which of the listed infrastructure projects would help your company's activities?

Figure 2.49. Which of infrastructure projects would help your company's activities?

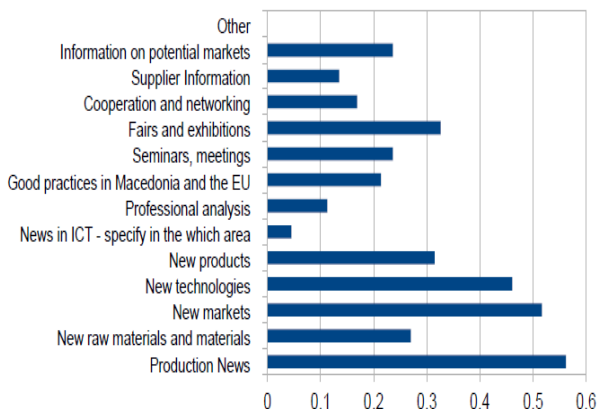


Regarding the question which of the mentioned infrastructural projects would help the activities of your company positively answered: maintaining the existing roads 39%, expanding the existing roads 36%, and an agreement for new roads 19%, improving the access to the railway 6% and improving the access to the nearby airports 1%.

- If you have access to a virtual educational platform, what kind of information would you request in / from it?

Asked if you have access to a virtual educational platform, what kind of information would you require in / positively answered: production news 16%, new raw materials 8%, new markets 14%, new technologies 13%, new products 9%, news in ICT – specify in which area 1%, professional analyzes 3%, good practices in Macedonia and the EU 6%, seminars or meetings 7%, fairs and exhibitions 9%, cooperation and networking 5%, suppliers information 4% and information about potential markets 7%. On this issue, the differences in the positive answers regarding the offered solutions are very small as the needs of the surveyed companies.

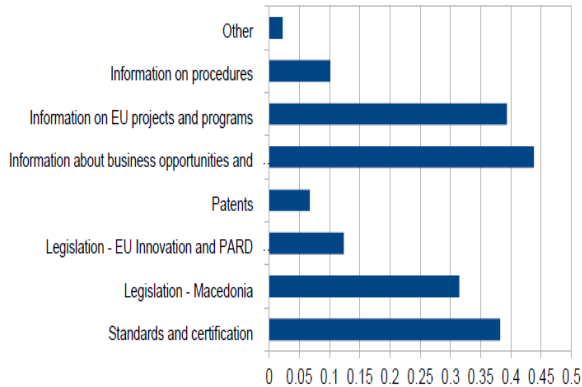
Figure 2.50. What kind of information would you require from a virtual educational platform?



- If you have access to a virtual consulting office, what kind of information would you require?

If there existed a virtual consulting office, the surveyed companies would request the following information from it: information for the possibilities for business and foreign markets 24%, information for EU projects and programs 21%, standards and certification 21%, legislature – Macedonia 17%, legislature – EC innovations and NIRD legislature 7%, information for procedures 5%, patents 4% and other solutions 1%.

Figure 2.51. What kind of information would you require from a virtual consulting office?



Development and competition

In the surveyed questions, there are also several related to the development and competition of the companies of domestic and foreign markets. This group of questions is developed with three concrete issues from this field.

- What, in your opinion, is the basis for your competitiveness?

Regarding the question “what is your competitiveness due to?“, the surveyed companies gave the following answers: cheap labor force 19%, qualitative production 14%, popularity of the company 913%, cheap transport 11%, unique production processes 9%, well trained experts 9%, cheap natural resources 7%, well developed transport network 7%, popularity 7% and other 3%.

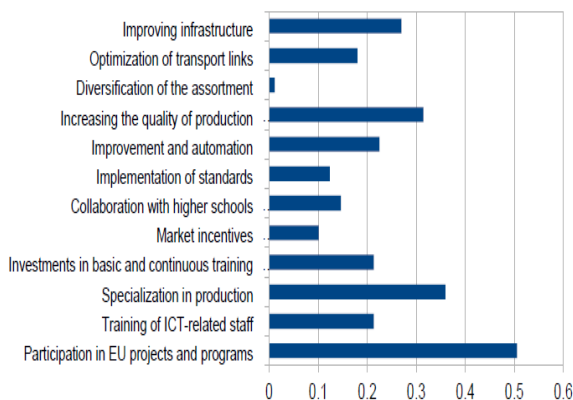
- How strong is the competition on your local market?

With this question a classification of the surveyed companies according to competition is made, and the following answers regarding competition are obtained: very strong competition have 20% of the surveyed, strong 18%, nor strong – nor weak 42%, weak 10% and very weak competition have 7% of the surveyed. 3% of the surveyed companies did not answer this question.

- What proposals will you give to increasing the competitiveness of companies from the forest sector on a regional plan?

The surveyed companies favor the following proposals that would increase the competitiveness of the companies from the forestry sector in the regional plan: participation in EU projects and programs 17%, specialization in production 14%, increase in the quality of production 12%, improvement of the infrastructure 10 %, staff training related to ICT 9%, investments in basic and continuous training 9%, improvement of production processes 8%, optimization of transport connections 7%, cooperation with higher education institutions, forestry institutions 5%, implementation 5% of market standards, market incentives for clustering in 4% and diversification of assortment 0%.

Figure 2.52. What proposals will you give to increasing the competitiveness of companies?



The questions 43 to 46 pertain personal data for contact of the surveyed companies.

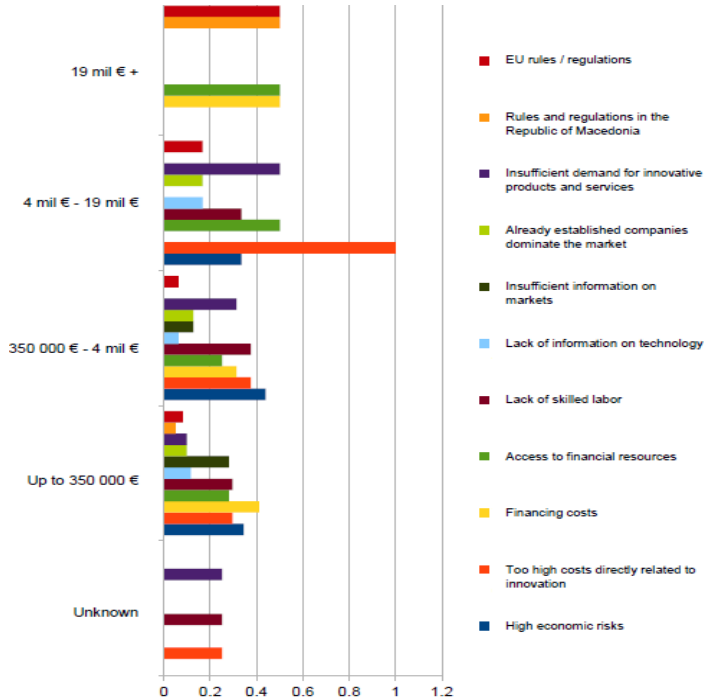
Comparative analyses

The received database represents a basis for a comparative analysis between the different groups of firms and their answers for innovation in forestry and the woodworking industry. These researches should intensify with the formation of a larger database and polling of a larger number of companies, with which representative answers and analyses would be acquired. For this occasion, models of mathematical statistical dependence of two analysis developed, which are:

Number of companies according to the balance sheet of the assets regarding several issues (occurrences):

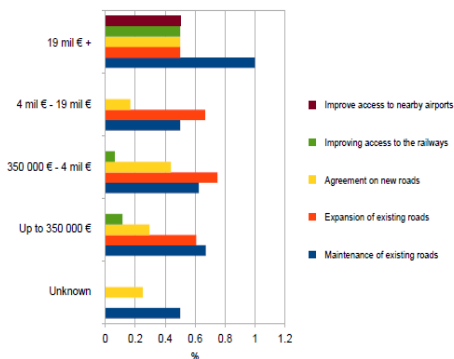
- Balance sheet of assets vs. in the three year period from 2014 to 2016, which were the obstacles in realizing the innovative activities in your company?

Figure 2.53. Obstacles in realizing the innovative activities by size of company



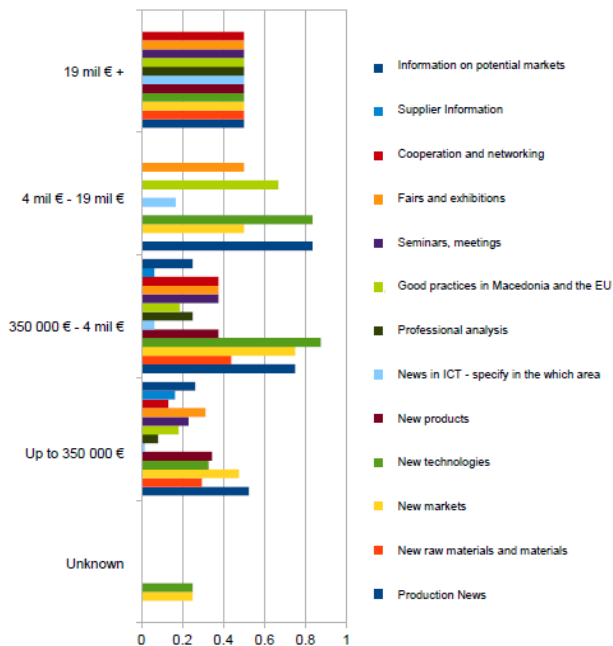
- Balance sheet of assets vs. which of the stated infrastructural projects would help the activities in your company?

Figure 2.54. Needed infrastructure by size of firms



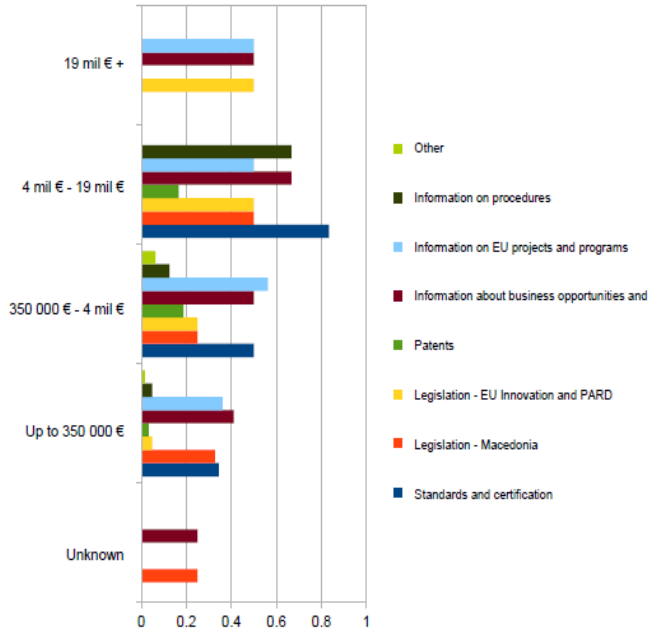
- Balance sheet of assets vs. if you have access to a virtual educational platform, what kind of information would you request in/from it?

Figure 2.55. Education needed for companies by size



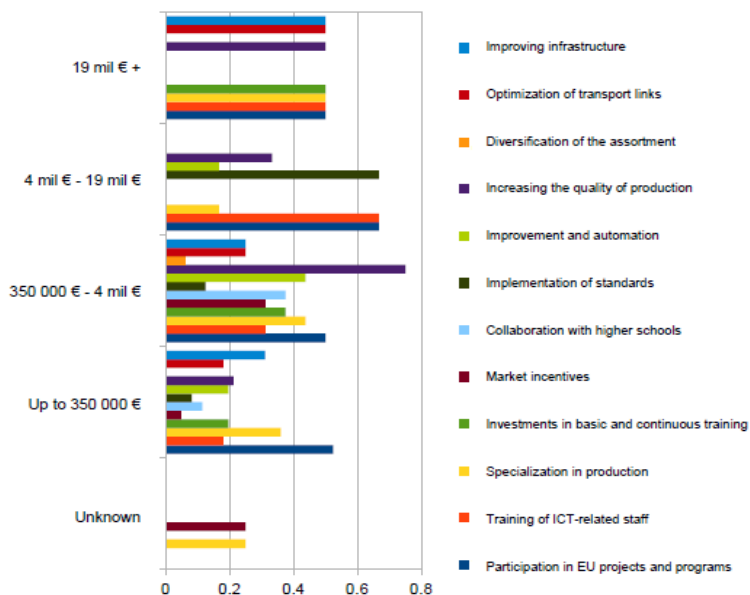
- Balance sheet of assets vs. if you have access to a virtual consulting office, what kind of information would you request from it?

Figure 2.56. Consultancy needed by size of firms



- Balance sheet of assets vs. what recommendations would you give for increasing the competition of companies in the forestry sector in a regional plan?

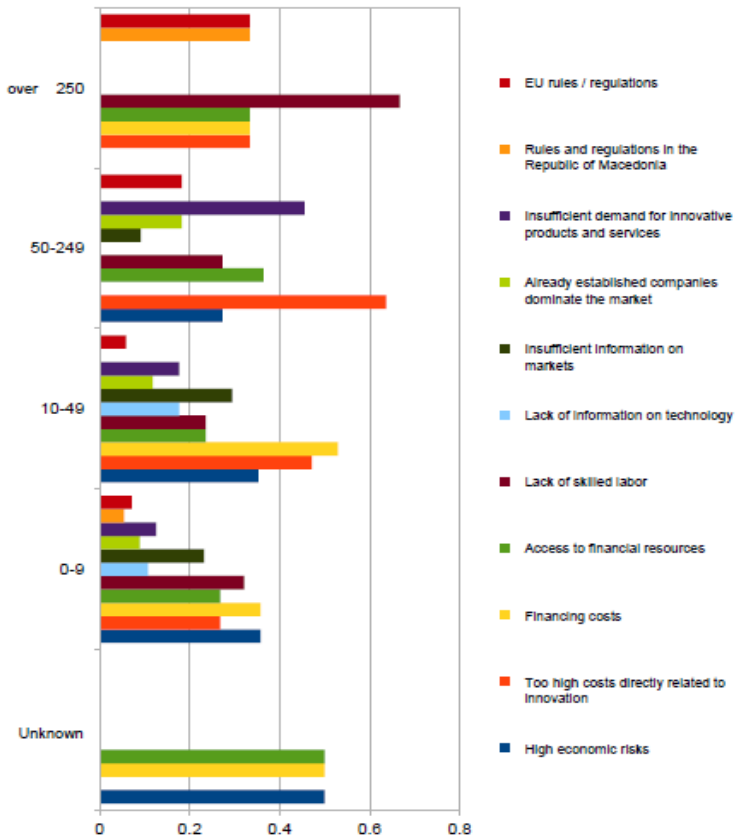
Figure 2.57. Recommendations for increasing companies' competitiveness by size of firms



Size of the companies according to the number of employees in relation to several issues (occurrences)

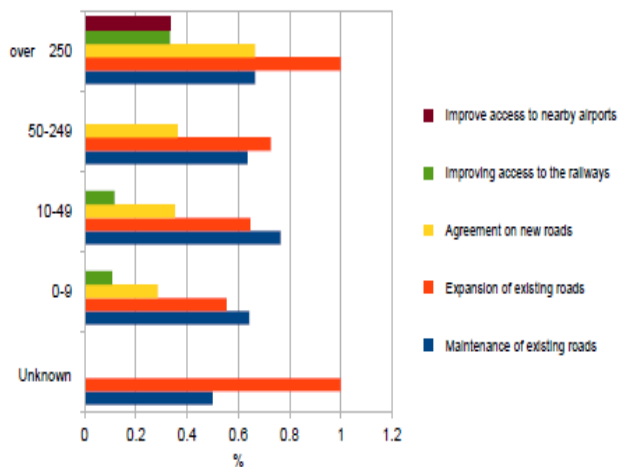
- Number of employees vs. in the three year period between 2014 to 2016, which were the obstacles in realization of the innovative activities in your company?

Figure 2.58. Innovative activities by size of companies



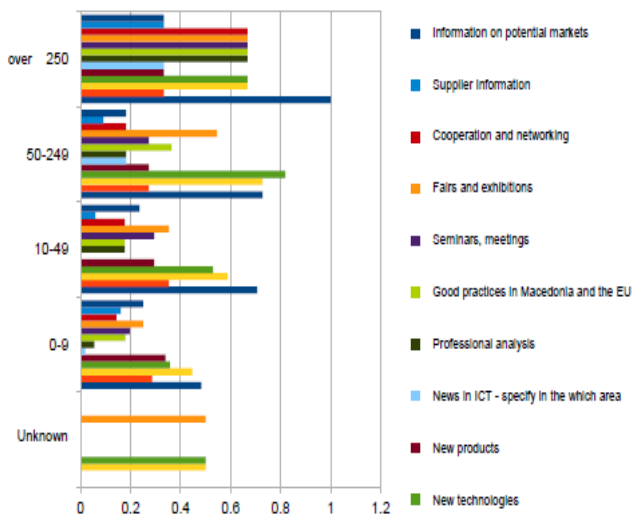
- Number of employees vs. which of the stated infrastructural project would help the activities of your company?

Figure 2.59. Infrastructure needed by size of company



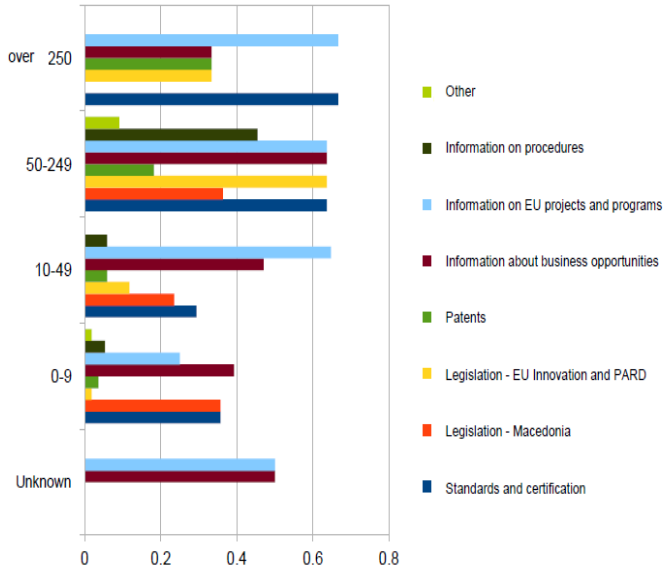
- Number of employees vs. if you have access to a virtual educational platform, what kind of information would you request in/from it?

Figure 2.60. Information needed from VEP by size



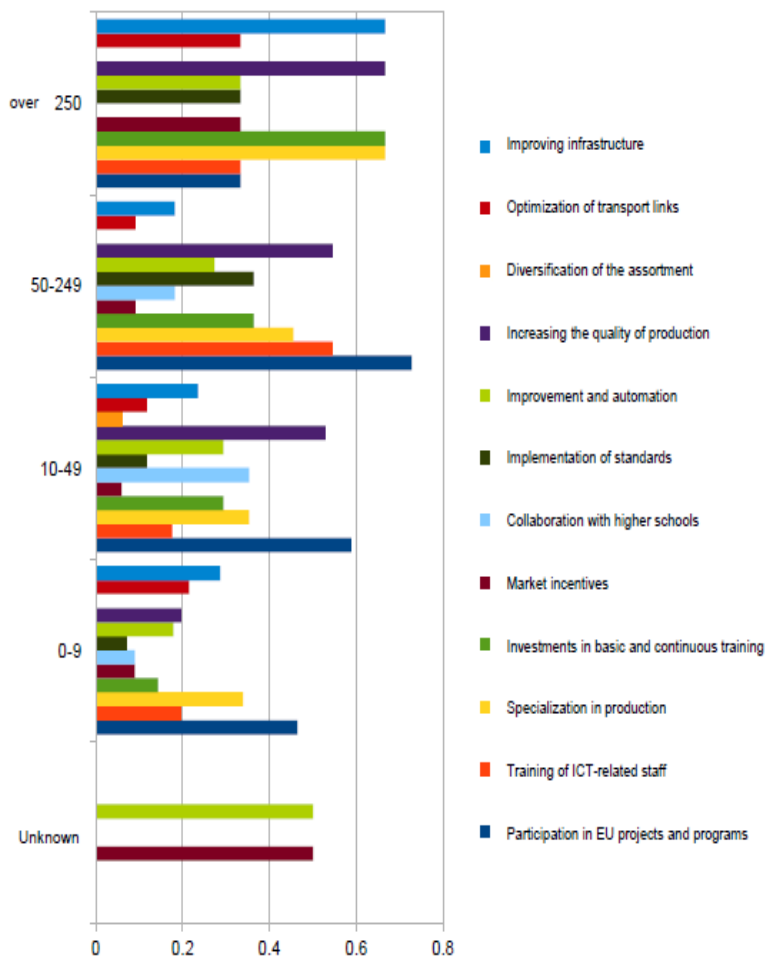
- Number of employees vs. if you have access to a virtual consulting office, what kind of information would you request from it?

Figure 2.61. Consultancy needed from VOFIS by size of company



- Number of employees vs. what suggestions would you give for increasing of the competition of companies in the forestry sector in a regional plan?

Figure 2.62. Suggestions to improve competitiveness by size of company



Conclusion and discussion

Basic conclusions that come from the conditions in the sector and the indication of the surveyed subjects:

In the forestry sector in the Republic of Macedonia one of the basic problems according to the indication of part of the surveyed companies is the poor organization of production of wood and wood assortments in P.E. Macedonian Forests. The little amounts of wood that are given only on a yearly tender, pertain each sub-unit individually and pertain individually for performing individual operations in the forest: logging, loading and transport, represent a serious problem for providing a stable and concentrated work. This way of organization of the activities in the state forests does not allow the companies-contractors to introduce new technologies and techniques of work, and above all introduction of modern mechanization with bigger capacity and with that also accomplishing bigger competition in the activities.

In the forestry sector a serious lack of qualified work force is also noticed. Generally, the openness with roads in the forests is not good. In this region there is no thick enough and developed road network, and the existing roads are of bad quality and are used only seasonally.

In the logging sector there is a problem providing enough amount of raw material with the appropriate quality (wood for processing). Very often the sawmill owners complain about the bad production and wood processing in assortments. Also the raw material is available only seasonally because winter logging is not organized at all because of the bad infrastructure in the mountains. Also a problem in the sector represents the qualified work force as well as the frequent migration of workers on different working positions and more and more frequent immigration abroad. Regarding the secondary and final wood processing the need for new technologies is felt as well as an appropriate design and quality that would provide an appearance of new and larger markets.

Regarding the cross-border cooperation between the surveyed subjects there exists interest for cooperation because: the possibilities that the region and the forestry sector offers, the possibilities for exchange of experiences and positive practices as well as opportunities for joint appearance on the domestic and foreign markets.

Special conclusions that come from the implemented poll and the acquired results:

Basic information and characteristics of the activity of the company:

Surveyed are a total of 89 companies from varying areas of the forestry sector and logging industry. The surveyed companies have their headquarters in different cities in the cross-border region towards the Republic of Bulgaria. The structure of the surveyed

companies is different by: age, gender, education and work position in the companies. Managers of the companies are dominantly surveyed who are mostly men with higher education or secondary vocational education. The companies are mostly privately owned and registered as a limited liability company. The P.E. Macedonian Forests manages the state forests through its own forestry management who have their headquarters in the bigger cities in the region.

The surveyed companies are dominantly in the category of small legal subjects and most frequently have from ten employees. These companies dominantly work on the domestic market.

The surveyed companies have computers in their work and use internet mostly for: interaction with the public enterprises, use of electronic invoices, use of social media as well as organization of the website of the company. A bigger part of the companies do not have a website.

Regarding the cooperation between the surveyed companies from the Republic of Macedonia with companies from the Republic of Bulgaria it can be stated that it is very small and is not at all compatible with the possibilities and potential of the region. Only 10% of the Macedonian companies have clients from the Republic of Bulgaria whereas the suppliers have only 15% of the surveyed companies. At the same time the companies-contractors from the Republic of Macedonia are involved with different activities.

Innovative activity of the company:

Regarding the innovative activity the companies have different technological activities. From the poll it can be concluded that so far in procurement of machines as well as training for the employees it has been invested the most. The percentage is also large for the companies that have not made investments in innovative activities.

From the surveyed companies 43% positively answered that they are introducing technological innovations, mostly with own, internal resources. Also 36% of the surveyed companies introduced new and improved products. The percentage of introduction of new organizational changes or new management techniques in the companies is similar. The largest percentage of the companies did not give a concrete answer for the difficulties in the realization of the innovative activities.

Having in mind that with the poll varying subjects who have varying needs for their activities are involved, it can be stated that the needs for innovation and innovative activities are very different. From here the need for introducing a wide specter of training and programs with innovative activities is imposed.

Markets and procurement:

The market in the analyzed region is very limited and dominantly locally oriented. Very small amounts of raw material and products are placed in the neighboring municipalities or in the cross-border region of the Republic of Bulgaria.

A solution for these problems has to be discovered in perspective, especially if it is known that the transport expenses of the companies that work in the forestry sector are very high. The need for maintaining the existing and building new roads as well as the construction of railway towards the Republic of Bulgaria is imposed.

The surveyed companies positively view the need for introducing a virtual educational platform. At the same time from this platform a wide specter of offers is required because the companies have different needs and priorities for their even more successful operating.

Part of the companies positively also view the existing of a virtual consulting office in the following activities: information for business opportunities, information for foreign markets, information for EU projects and programs, standards and certification, consultations regarding legislature in Macedonia, Bulgaria and EU and other programs and activities.

Development and competition:

The competition of the companies on the domestic and foreign markets the companies from the Republic of Macedonia view in different activities and conditions. The companies view their own competition in: cheap labor force, quality production, popularity of the company, cheap transport, unique production processes, well trained experts, cheap natural resources, well developed transport network, popularity and other.

Competition of the local markets most often is defined as neither strong nor weak.

The surveyed companies are partial to the following suggestions that would contribute to increasing competition of the companies in the forestry sector: participation in EU projects and programs 17%, specializations in production 14%, increasing quality of production 12%, improving infrastructure 10%, training of IT personnel 9%, investments in basic and continued training 9%, improvement of production processes 8%, optimization of transport connections 7%, cooperation with high schools for forestry 5%, implementation of standards 5%, market stimulation for getting together in clusters 4% and other.

From the offered responses it can be concluded that the needs for increasing competition of the surveyed companies are different. From here it can be seen that

different activities with the goal of improving the condition with competition in the forestry sector and logging industry have to be worked on in the future.

Recommendations

- Legislature (changes in the legislature and system of operations of P.E. Macedonian Forests in the part of production)
- Infrastructure (Measures for improvement of the infrastructure in the forest, Measures for maintaining and building new roads in the region, Construction of railway traffic towards the Republic of Bulgaria and other)
- Virtual office (Database, Platform for professional education and training, Platform for consultations in the sector, Development of competition and entrepreneurship, Activity of mutual EU projects and other)

3. Women Working in the Forestry Sector in the Republic of Macedonia (Results of Survey in 2017)

This paper represents an analysis of the responses provided by the implemented questionnaire about the situation and representation of women in the forestry sector in the Republic of Macedonia, in the small and middle enterprises, in the cross-border region.

Here we will look at the current condition in the whole region and will give recommendations and suggested measures and activities taking into consideration the real economic, ecological and structural surroundings. An appropriate transformation of the society and reaching equal status of women in the forestry sector will be achieved with effective and quick change especially through planned and coordinated measures and activities that need to be undertaken and implemented in the different areas of societal living in the direction of establishing the equal opportunities principle, through introducing new concepts, themes and program contents for processing. The development of individual potential of women contributes for bigger societal development in general.

The questionnaire is a result of strategic planning in the forestry sector that integrates the processes of research, analysis, planning and control with the purpose of providing a real and practical insight into the condition of women in the forestry sector in the cross-border region, and to achieve the anticipated degree of equal representation of men and women.

Target group

The questionnaire was implemented on 500 small and middle enterprises in the cross-border region in the Republic of Macedonia. Main target groups are small and middle enterprises in the forestry sector in the allowed regions, as well as trade and industrial chambers and universities.

The total number of respondents is 29 (in letters: twenty-nine).

Region

The questionnaire was implemented in the cross-border region (eastern and southeastern), on the territory of the Republic of Macedonia.

Methodology of the research

A questionnaire was prepared for the needs of this research, with qualitative and quantitative approaches, as an instrument with which the status of women in the forestry sector, the hurt and abused, means of protection, as well as suggested activities and need for raising awareness in society will be determined.

The preparation phase of the research in itself contained activities that provided a solid basis for appropriate data collection necessary for analysis, such as: consultations and telephone communication on a daily basis with the coordinators, with the purpose of preparing the basis of the research (acquiring a maximum of information); determining the final version of the questionnaire for the research:

The research should offer explicit and implicit solutions for the positive changes, in the direction of achieving of greater inclusion of women in the forestry sector, and acquiring equal status with men. At the same time, it should also offer suggested activities for further development, as well as direction for future project solutions and activities.

On the basis on the received results, measures and recommendations for raising awareness should be suggested. In addition, the needs for education and training for raising awareness for the condition of women in the forestry sector will be determined.

Results

The acquired results from the answered questionnaire should give directions how to continue on with the project activities, what target groups to include more concretely in the next period, about what themes the questioned would like to get more detailed information, contents and materials, training, what kind of format of activities should be determined in accordance with their suggesting and ideas, etc.

General information for interviews

- Age of the respondents is in the range of 26 years to 64 years, i.e.:

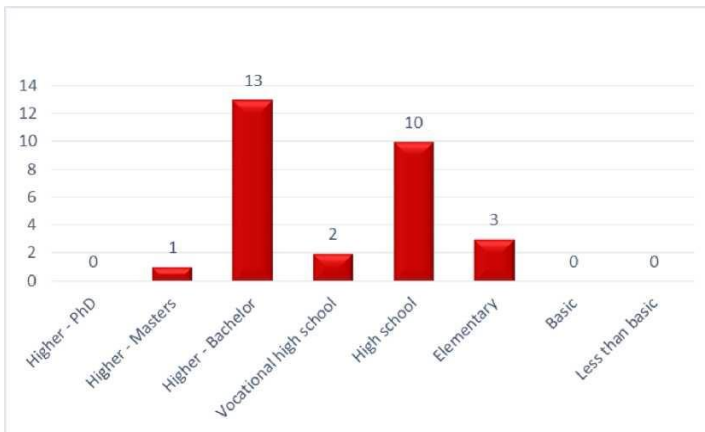
Table 2.1. Age of respondents

- 3 respondents with 38 years of age	- 1 respondent with 35 years of age
- 2 respondents with 26 years of age	- 1 respondent with 33 years of age
- 2 respondents with 28 years of age	- 1 respondent with 37 years of age
- 2 respondents with 43 years of age	- 1 respondent with 29 years of age
- 2 respondents with 36 years of age	- 1 respondent with 48 years of age
- 2 respondents with 57 years of age	- 1 respondent with 56 years of age
- 1 respondent with 42 years of age	- 1 respondent with 50 years of age
- 1 respondent with 54 years of age	- 1 respondent with 41 years of age
- 1 respondent with 51 years of age	- 1 respondent with 64 years of age
- 1 respondent with 53 years of age	- 1 respondent with 34 years of age
- 1 respondent with 45 years of age	- 1 respondent with 52 years of age

- Marital status of the respondents:
 - 26 respondents with marital status married
 - 2 respondents with marital status unmarried
 - 1 respondent did not answer
- Number of children under 18 years of age
 - 3 respondents with 3 children under 18 years of age
 - 13 respondents with 2 children under 18 years of age
 - 2 respondents with 1 child under 18 years of age
 - 10 respondents do not have children under 18 years of age
 - 1 respondent did not answer
- Total work experience at the company's position with this and/or previous employer(s)
 - 9 respondents with work experience up to 5 years

- 4 respondents with work experience up to 10 years
- 8 respondents with work experience up to 20 years
- 6 respondents with work experience up to 30 years
- 2 respondents without work experience
- The presence of occupational diseases or reduced work capacity
 - 28 respondents do not have occupational diseases or reduced working capacity
 - 1 respondent had occupational diseases or reduced capacity
- Education (type and speciality)

Figure 2.63. Education (type and speciality)



Attractiveness of the forestry sector for women

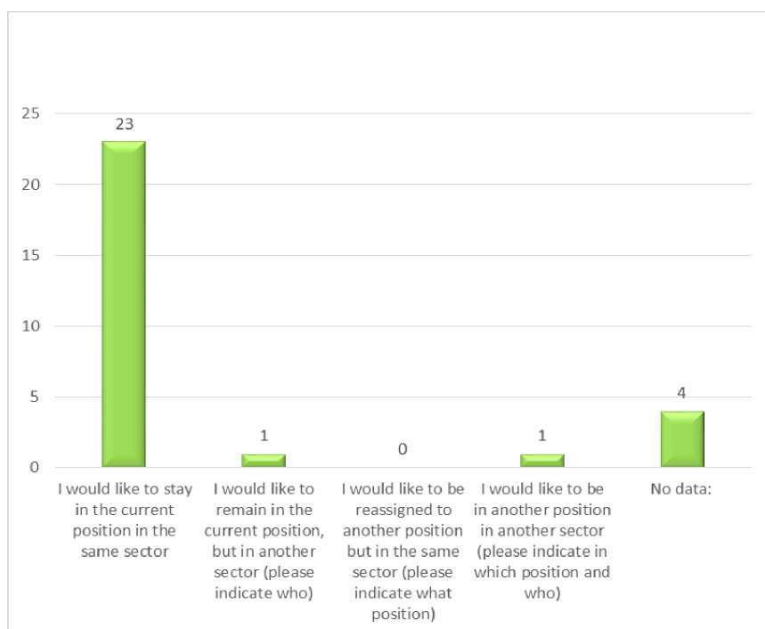
- Please list the main factors that you applied to your current job position. Please specify which was the main factor to choose your working position, given that 1 means unimportant and 4 very important factor. Please specify in each row.

Proposition	Very	Important	Slightly	Not important	No data
-------------	------	-----------	----------	---------------	---------

	important		important		
• My work is interesting	4	3	2	1	
Number of respondents	11	13	2	1	2
• Work is well paid	4	3	2	1	
Number of respondents	6	11	4	5	3
• Work is related to the specialty acquired by me	4	3	2	1	
Number of respondents	6	7	5	6	5
• I have always wanted to do such a job	4	3	2	1	
Number of respondents	6	7	6	8	2
• There are many opportunities for career development	4	3	2	1	
Number of respondents	3	9	5	7	5
• The insurance income for mutual obligations is high	4	3	2	1	
Number of respondents	1	10	8	5	5
• The employer provides opportunities for professional training and increasing the competences of the workers	4	3	2	1	
Number of respondents	7	8	6	5	3
• I needed a job	4	3	2	1	
Number of respondents	9	11	2	5	2
Other (please indicate)					/

- What are your future plans related to your job position?

Figure 2.64. What are your future plans related to your job position?



- Please indicate the extent to which you agree with the following claims, where 1 indicates that you do not agree at all, and 5 that you completely agree. Please specify in each row

Proposition:	I completely agree	I almost agree	I neither agree nor disagree	I almost disagree	I completely disagree	No data
• I am satisfied with the income from my work	5	4	3	2	1	0
Number of respondents	8	9	7	1	3	1
• The work I do is equal to the salary I receive	5	4	3	2	1	0
Number of respondents	8	9	4	2	4	2

• The salary I get corresponds with the qualifications I have	5	4	3	2	1	0
Number of respondents	9	6	7	3	3	1
• I am pleased with the way in which the salary is formed	5	4	3	2	1	0
Number of respondents	12	5	4	3	3	2
• The salary I receive does not differ from what the men receive	5	4	3	2	1	0
Number of respondents	13	7	3	1	4	1
• I am satisfied with the working conditions at the workplace	5	4	3	2	1	0
Number of respondents	11	11	1	1	4	1
• An additional salary would motivate me to work better	5	4	3	2	1	0
Number of respondents	20	4	3	0	0	2
• Better working conditions would increase my productivity	5	4	3	2	1	0
Number of respondents	18	5	3	0	1	2
• I do not care what is written in my agreement as long as I get a salary that suits me	5	4	3	2	1	0
Number of respondents	6	2	1	5	11	4

- Are you familiar with the following rights for women:

Figure 2.65. a) Discrimination at the workplace

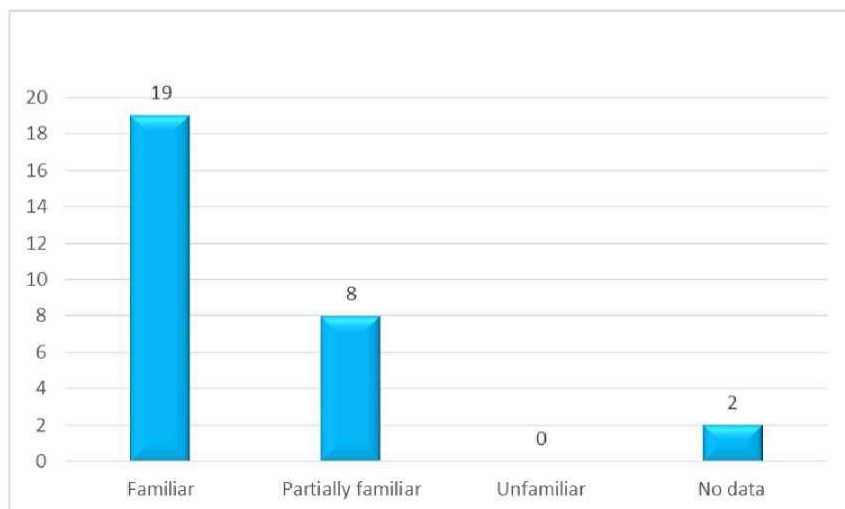


Figure 2.66. b) Equal pay for men and women

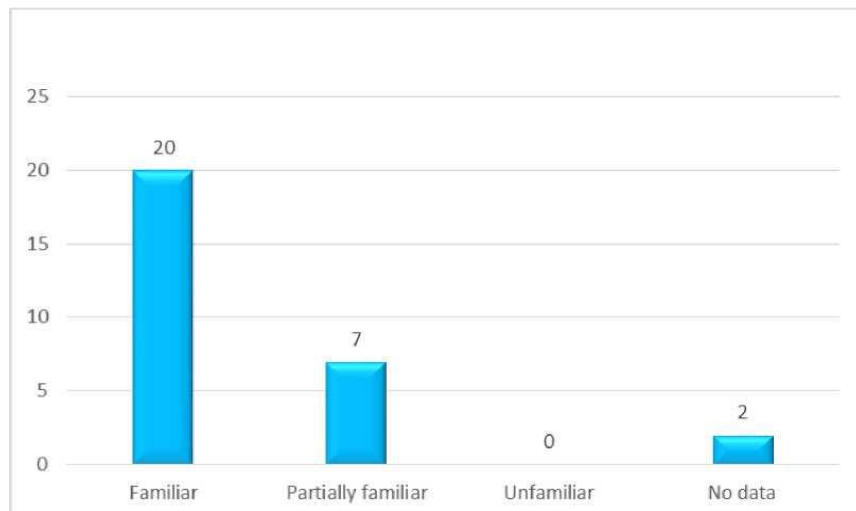
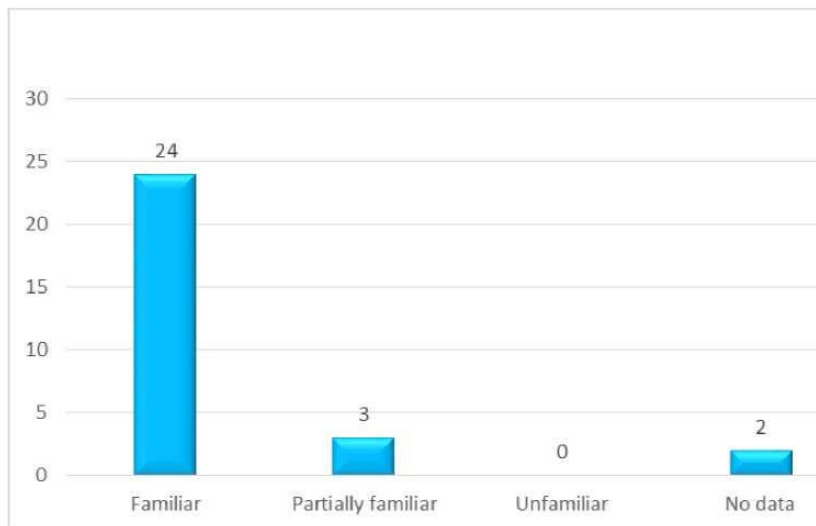


Figure 2.67. c) Access to education



- Please indicate which are your main concerns for your current work. Please indicate the degree of importance for the following claims, taking into account that 1 signifies valid to a very small extent while 4 marks valid to a very large extent for you and your work. Please specify in each row.

	Valid to a very large degree	Valid	Almost invalid	Completely invalid	No data
■ Lack of development in the career plan	4	3	2	1	0
Number of respondents	5	15	4	3	2
■ Job loss	4	3	2	1	0
Number of respondents	9	8	4	6	2
■ Loss of some of the responsibilities due to maternity leave	4	3	2	1	0
Number of respondents	3	8	7	8	3

Forestry Sector in Bulgaria and Macedonia

■ Difficulty in bringing up children and working	4	3	2	1	0
Number of respondents	4	6	3	13	3
■ I am concerned that the employer does not become disappointed with the quality of my work	4	3	2	1	0
Number of respondents	11	5	2	9	2
■ Misunderstandings with the colleagues at work	4	3	2	1	0
Number of respondents	7	5	8	7	2
■ Working outside work hours	4	3	2	1	0
Number of respondents	10	3	7	7	2
■ Concerned about whether I can show potential	4	3	2	1	0
Number of respondents	7	8	2	9	3
■ Concerned about whether my opinion is respected	4	3	2	1	0
Number of respondents	9	6	4	6	4
■ Concerned that there is inter-gender discrimination	4	3	2	1	0
Number of respondents	5	2	8	11	3
■ Concerned that I will be given assignments before I use maternity leave	4	3	2	1	0
Number of respondents	5	5	1	15	3
•Other... (please specify)	/				

- Are there any special programs / courses and methods for improving women's skills in your company?

1. Yes	2. No	3. Don't know
2	23	3
No data:	1	

- Do you think that the increased number of trainings for women in the forestry sector will contribute to the competitiveness?

1. Yes	2. No	3. Don't know
22	3	3
No data:	1	

- Please indicate to what extent the following factors affect the health status of women workers in the forestry sector. Please indicate from 1 to 5, where 1 indicates that it does not have an impact and 5 that it has a very high impact. Please specify in each row.

Factors / degree of risk	Very high impact	Large impact	Medium impact	Low impact	No impact	No data
■ Mechanical hazard of use and maintenance of specific technological equipment	5	4	3	2	1	0
Number of respondents	9	3	5	6	3	3
■ Electricity, including static electricity	5	4	3	2	1	0
Number of respondents	6	3	2	6	8	4
■ Lighting that does not meet the requirements for work	5	4	3	2	1	0
Number of respondents	4	6	7	2	8	2
■ Danger of fire	5	4	3	2	1	0

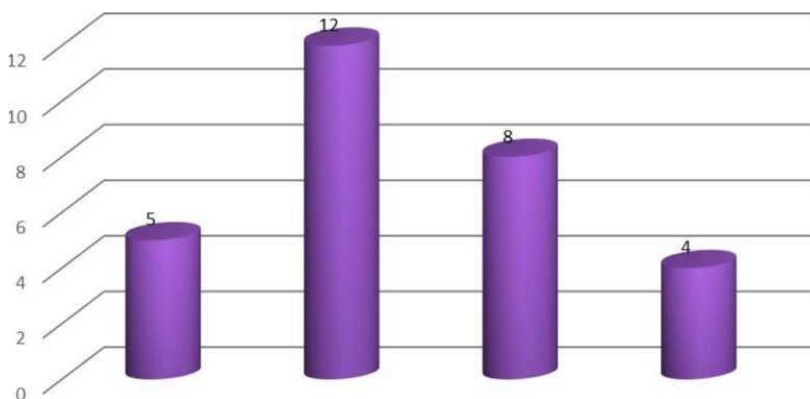
Forestry Sector in Bulgaria and Macedonia

Number of respondents	8	5	3	2	7	4
■ Noise and vibration (clamor, ultrasound, infrasound)	5	4	3	2	1	0
Number of respondents	10	2	4	3	7	3
■ Wood dust	5	4	3	2	1	0
Number of respondents	11	2	2	5	5	4
■ Open-air work	5	4	3	2	1	0
Number of respondents	9	4	6	6	2	2
■ Unfavorable microclimate (temperature, humidity, air speed)	5	4	3	2	1	0
Number of respondents	7	3	6	4	6	3
■ Biological agents (microorganism, parasites, bacteria and viruses) and forest animals	5	4	3	2	1	0
Number of respondents	5	6	4	4	8	2
■ Manual work with weights	5	4	3	2	1	0
Number of respondents	6	3	4	5	6	5
■ Repetitive movements of the same type	5	4	3	2	1	0
Number of respondents	4	5	3	4	9	4
■ Prolonged walking and / or standing in forest areas	5	4	3	2	1	0
Number of respondents	5	4	3	3	9	5
■ Extended working hours	5	4	3	2	1	0
Number of respondents	8	5	3	3	6	4
■ Work pose	5	4	3	2	1	0
Number of respondents	7	2	4	3	8	5
■ Radiation (ultraviolet, infrared, laser, ionized)	5	4	3	2	1	0
Number of respondents	6	3	5	2	8	5

- How much work do you do outdoors?

Question:	Number of respondent:
A) 1 h	3
B) 2 h	5
C) 3 h	2
D) more than 3 hours	5
E) I do not spend time outdoors	11
No data:	3

- Would you shorten your maternity leave to get back to work if the employer provides you with working conditions and raising the child in the work environment (for example, with a nursing job at work)?



Recommendations and proposed measures

1. Additional educational materials and trainings for raising awareness among all citizens on the equal rights of women and men;
2. Development of educational material in order to provide quality, accurate information, i.e. preparation of a manual / guide

Conclusion

Building capacities for equal representation of women in the forestry sector, especially education on this subject, is not an easy process at all, it is an effort to jointly find mechanisms for finding a systemic solution for greater involvement of women in this sector, and the effort to build a democratic society free from stereotypes about the state of women in society.

Through the realization of a planned process of activities, the border region should grow into an economically strong, rural and industrial oriented region with developed infrastructure, established production capacities in the forestry sector, improving competitiveness, equality of representation of women and men, improving the quality of the life of the rural population, increasing income and creating new employment opportunities.

For that purpose, it is necessary to continue the activities of the project with the implementation of the proposed measures, as well as the support of women not only in the border region, and not only in the forestry sector, but also at the national level, in the public and private sectors, equally.

4. Women in Forestry Sector – Performance and Problems (Results of Survey in Bulgaria)

This paper aims to characterize the employment rate, performance as well as economic and social work conditions for women in forestry sector in Bulgaria. It also aims to characterise the impact of factors affecting competitiveness and productivity corresponding to females employment, such as: formation of wages; education and training, insurable earnings for women in the sector, etc. The study is based on literature and legal framework survey, as well as on statistical analysis and individual interviews. The data is compared to primary results from a survey conducted in 2017 among a database of 1087 forestry enterprises in Bulgaria. The survey is a part of project № CB006.1.31.070 “Innovative cooperation initiatives in cross-border region” where Bulgarian academy of science is a leading partner. In addition it is used data from individual interviews, conducted in 2017 with employed women working in the forestry sector in Bulgaria. At the end, some conclusions and policy recommendations are drawn.

One of the main strategic objectives of the European Union (EU) is to achieve inclusive economic growth by increasing the level of female employment in the Member States of the Union. There are some specifics of employing women in forestry sector. On one hand a major challenge to the forestry sector development in Bulgaria is the loss of competitiveness that results to negative consequences such as slowing the economic

growth and ineffective utilization of forest resources in the country (Chobanova R., 2016, p.61). On the other hand, the different activities in forestry are not equally attractive for women and this has to be taken into account when identifying where increasing the employment could lead to better labour productivity and competitiveness of the sector. In this respect it is important to characterize the employment rate, performance as well as normative and real work conditions for women in Bulgarian forestry sector and factors affecting them.

Employment of women in the forest sector in Bulgaria

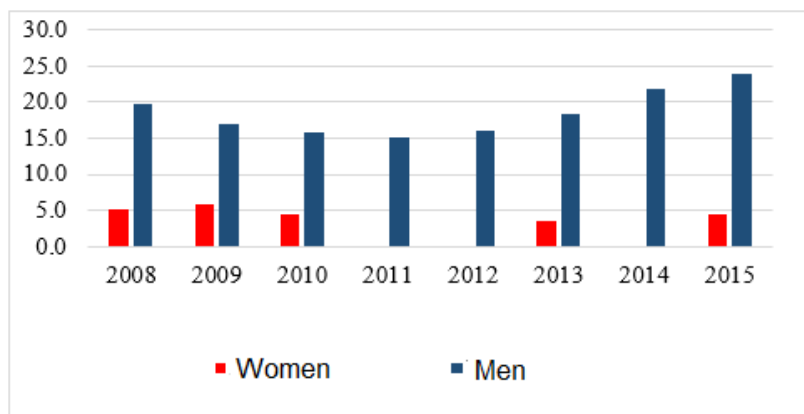
The employment rate among women in Europe is lower than that of men, especially at the age between 20 and 64 years. Currently on European Union (EU) level the employment rate of females is 63% and the employment rate of males is 76%. In 2015 the employment rate among men and women in Bulgaria is 67.1% (Employment rate, age group 20-64, European countries [Data file]. Retrieved from <http://ec.europa.eu/eurostat/web/europe-2020-indicators>). Such kind of data affects the process of achieving inclusive economic growth by increasing the level of employment, especially among women, in the Member States of the Union. Because of that on a national level, a priority objective of Bulgaria is to increase the employment rate of people at the age between 20 and 64 years, up to 76% by 2020 (Europe 2020: National reform programme, 2015, p. 49). To do that for each year from 2015 to 2020 the considered ratio should mark an annual growth of approximately 1.58 percentage points. It should be noted that for the period 2000 - 2015 the highest percentages of employment rate are recorded in 2008 (70.70%). As a result of the economic crisis from 2009 to 2015 the ratio is below 69%. (Europe 2020: National reform programme, 2015, p. 49).

In 2015 the number of employed women in Bulgaria is approximately 9 percentage points more than the number of employed men. Such kind of data could be considered as positive when it comes to the participation of females in the labor market. When it comes to forestry sector the employment of women differs from the general employment in the economy (Chobanova & Georgieva, 2017).

For the period 2008-2015 the employment of women in forestry industries is lower, more specifically in "Forestry and logging"; "Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials"; "Manufacture of paper and paper products"; "Manufacture of furniture".

For the year 2015, the proportion of women employed in "Forestry and logging" is only 5% of the total number of employed in the industry (see Figure 2.69). The largest number of women employed in the industry is in 2009 (5.9 thousand), and the smallest in 2013 (3.6 thousand).

Figure 2.68. Employed men and women in Bulgaria in the forestry and logging industry, 2008-2015 (thousand)



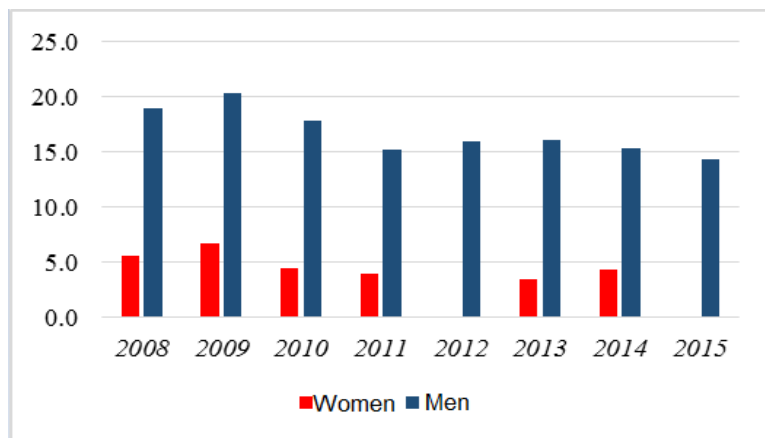
Source: Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Extracted on 27.01.17

For the industry "Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and knitting materials", it can be stated that employed women represents only $\frac{1}{4}$ of the total number of persons employed in the industry (see Figure 2.70). The highest employment rate of women in the analyzed industry is in 2009 (6.7 thousand) and the lowest in 2013 (3.4 thousand).

In enterprises producing paper and paper products on the territory of Bulgaria the number of employed women is the largest in 2009 (4.9 thousand) and in 2010 (4.8 thousand). Employed women are approximately 40% of the total number of employed workers in the industry (see Figure 2.71).

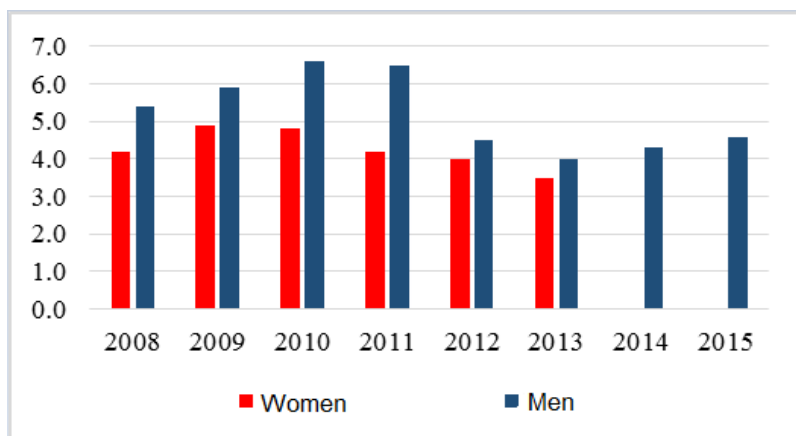
Figure 2.69. Employed women and men in Bulgaria in the production of timber and products of wood and cork, without furniture; manufacture of articles of straw and knitting materials, 2008-2015 (thousands)



Source: Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Extracted on 27.01.17

Figure 2.70. Employed women and men in Bulgaria in the manufacture of paper and paper products, 2008-2015 (thousands)

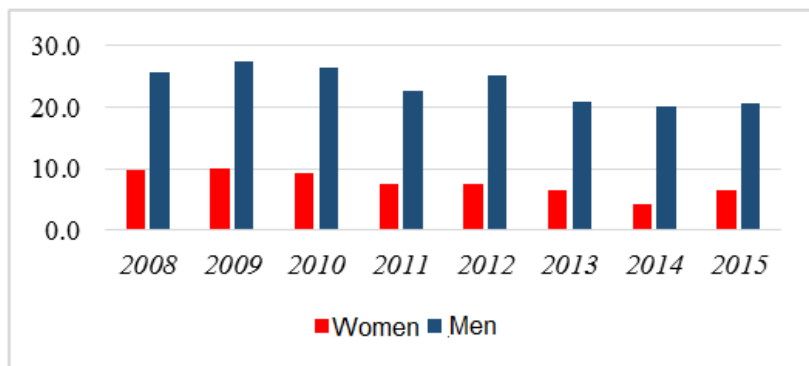


Source: Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Extracted on 27.01.17

In the furniture manufacturing industry, the largest number of female employees is in 2009 (9.9 thousand) and the smallest in 2014 (4.3 thousand). In 2015, compared to 2014, there is an increase of the number of employed women by 6.52%, which is almost equal to the reported data in 2013 (4.5 thousand). From 2011 to 2015, women are around 20% of the total number of employed in the industry (see Figure 2.72).

Figure 2.71. Employed women and men in the production of furniture in Bulgaria, 2008-2015 (thousands)



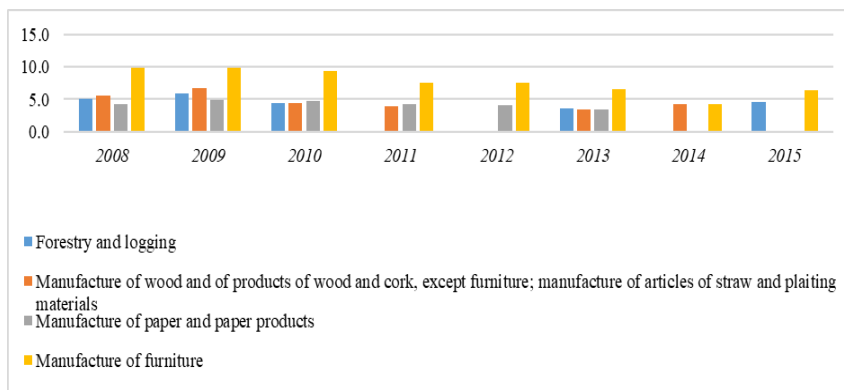
Source: Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Extracted on 27.01.17

Based on the above it can be mentioned that the highest number of employed females is reported in the "Manufacture of furniture" but their share, however, is only 1/5 of the total number of the employed in the industry (see figure 2.73). One of the most underdeveloped industry, based on women employment's rate, is "Forestry and logging". In addition, for the time period that is analyzed, all considered sectors reports an outflow of female labor force. The lowest employment rate of women is for the years 2014 and 2015. Therefore, although at national level there are overall improvement in employment rates, the data for the forestry sector indicates lower activity in the labor market.

Figure 2.72. Employed women in "Forestry and logging"; "Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of

***straw and plaiting materials"; "Manufacture of paper and paper products";
"Manufacture of furniture", 2008-2015 (thousands)***



Source: calculated using data from Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Last update on 21.12.16, Extracted on 27.01.17

The lower activity of women in the labour market could be due to:

- Different payment and minimum monthly insurance income of women employed in forestry.
- Activities that could be harmful for the health of females.
- Different working conditions and social status of females in forestry sector that have come back from maternity leave.
- Loss of competitiveness due to low level of education.

The factors mentioned above could lead to loss of competitiveness that results to negative consequences such as slowing the economic growth and ineffective utilization of forest resources in the country.

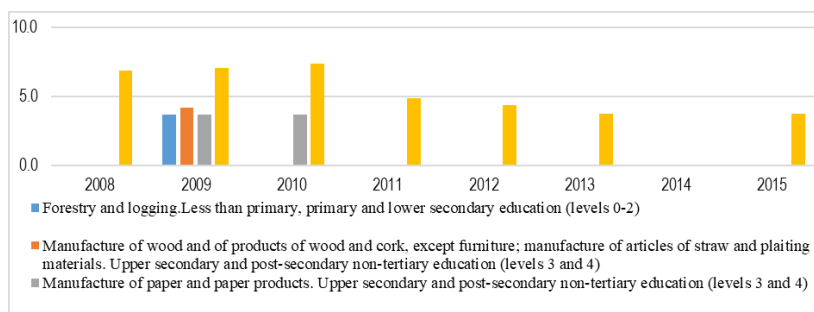
Education and Training of Women Working in the Forestry Sector

Among the main factors affecting productivity and competitiveness is education. For that purpose by 2020, 40% of women and men who are at the age between 30 and 34

years should acquire tertiary or equivalent education (Europe 2020 strategy for smart, sustainable and inclusive growth, p.13). At national level the goal is by 2020 to increase the percentage of people, falling in the age group between 30 and 34 years old, who have tertiary education up to 36%. In 2016 this percentage is 33.4%, which marks a positive trend.

The impact of education in forestry sector to the growth differs from the national level. Taking into account the fact that women who are employed in the forestry sector in Bulgaria have low level of education and skills (see figure 6) the impact of this factor could not be defined as positive for improving competitiveness in the forestry sector. In addition, none of the considered forestry sectors reports data for employed women that have tertiary education.

Figure 2.73. Educational level of women in "Forestry and logging"; "Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials"; "Manufacture of paper and paper products"; "Manufacture of furniture", 2008-2015 (thousands)



Source: calculated using data from Eurostat, 2016, [online]:

http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=for_emp_ifs&lang=en, Last update on 21.12.16, Extracted on 27.01.17

However, we must note that women participated in the survey do not believe that by increasing the number of common educational trainings it will contribute to greater productivity and development of the sector. At the same time women responds that except the hardships they experience when trying to combine work tasks with family obligations, another main concern of females working in the forestry sector, is their job performance. More precisely they worry about a possibility of a lack of career development and at the same time they do not want to disappoint their employer by dropping down the quality of their work performance. An interesting fact is that even though the surveyed women do not believe in the positive correlation between education and job performance, 60.4% of the people participated in the survey stated

that they have tertiary education. Such kind of data can lead to the assumptions that the education they have is not appropriate for their job positions or they do not know how to use the knowledge they possess in real working environment. In this respect it is important trainings and education which women receive to be corresponding to the specific needs of the job position as well as the learning style of the person (Georgieva, 2016). In this regard it will be useful a separate survey concerning only the problems of education and training in forestry sector, and mainly on women working in it, to be conducted.

In order to identify the reasons for such lower level of female employment in forestry sector we will also examine the impact of general for the sector development factors such as minimum wage, minimum monthly insurance income, as well as specific for female employment factors such as differences in salaries and maternity leave.

Gross National Minimum Wage and Minimum Monthly Insurance Income of Women Employed in Forestry in Bulgaria

Gross national minimum wage

There is a common understanding, supported by several arguments that the correlation between women' participation in the labor market and the payment they receive is positive (Cuberes, Teignier, 2011, p. 9). On other hand, there is no significant deviations from the way of forming the wage of employees working in the forestry sector in Bulgaria compared to other economic sectors. Employees in the forestry sector that are receiving additional remunerations for working overtime and on Sundays are almost twice less than the country's total number of people receiving additional payments (Stefanova - Bogdanska D., 2014). In this context, women that are employed in the forestry sector relay mainly on the gross wages that are specified in their employment contracts.

For the purposes of forming the contracted gross wage significant influence have the minimum wage¹ for the country per year and the minimum monthly insurance income by professions and positions per year. The minimum wage regulates the minimum amount of salary, which women who are employed in the forestry sector must receive as remuneration. As a result of changes in economic, political and social level, the amount of the minimum wage (for all professions and positions in the country) increases annually and in 2017 it is 460 leva. It should be noted that Bulgaria is in the group of

¹ The minimum wage is the lowest wage on an hourly, daily or monthly rate that employers may legally pay to their employees. It has gross nature, must be form based on market principles and is annually determined by the state.

countries in Europe in which the monthly minimum wage is below 500 EUR². This in turn is a factor that affects the income of employed women in the forestry sector. The annual changes of the minimum wage are essentially a prerequisite for changes of the average annual salary which employed females in "agriculture, forestry and fishing" receive³. From 2010 to 2015 there is insignificant increase of the average annual salary of women who are employed in the sector (see figure 2.75).

Figure 2.74. Average annual wages of men and women employed in sector "Agriculture, forestry and fishing", 2010-2015 (BGN)



Source: calculated using data from National Statistical Institute, 2016; [online]:

<http://www.nsi.bg/bg/content/3958/%D0%BD%D0%B0%D1%86%D0%B8%D0%BE%D0%BD%D0%B0%D0%BB%D0%BD%D0%BE-%D0%BD%D0%B8%D0%B2%D0%BE-%D0%B8%D0%BA%D0%BE%D0%BD%D0%BE%D0%BC%D0%B8%D1%87%D0%B5%D1%81%D0%BA%D0%B8-%D0%B4%D0%B5%D0%B9%D0%BD%D0%BE%D1%81%D1%82%D0%B8-%D1%84%D0%BE%D1%80%D0%BC%D0%B0-%D0%BD%D0%B0-%D1%81%D0%BE%D0%B1%D1%81%D1%82%D0%B2%D0%B5%D0%BD%D0%BE%D1%81%D1%82-%D0%BF%D0%BE%D0%BB>, Extracted on 15.04.2017

When it comes to remuneration in forestry sector in Bulgaria, the collected and analyzed data from the survey shows that, there is a hesitation in the satisfaction level of the wages female receive. Women do not fully agree that the remuneration corresponds to the work they do and their qualifications and skills. They expressed dissatisfaction with the way wages are formed in forestry as general. The surveyed

² In the scope of the group of countries in Europe where the monthly minimum wages are below EUR 500 except our country falls further Romania, Lithuania, Hungary, the Czech Republic, Latvia, Slovakia, Croatia, Estonia, Poland and Albania, Montenegro, FYR Macedonia/ Republic of Macedonia and Serbia. From all the countries that are included in this group only Albania and FYR Macedonia/ Republic of Macedonia have less monthly minimum wages than Bulgaria.

³ In terms of national statistics it should be noted that the statistical data published in the NSI includes the information for the entire sector "agriculture, forestry and fishing." There is no published detailed data concerning only the forestry. Therefore, the following data and conclusions are made for the whole sector "agriculture, forestry and fisheries" in which forestry is included.

women agreed that additional remuneration would motivate them to make more efforts in fulfilling their work duties.

The gender equality can enhance competitiveness and economic productivity, which is a prerequisite for achieving higher economic growth (Cuberes D., M. Teignier, 2015, p.1; Revenga A., S. Shetty, 2012, p. 40-43). In the forestry sector in Bulgaria there is a pay gap between men and women which is increasing through the years. As main reasons for the existence of such gap the following factors can be mentioned (Tracking the gender pay gap in the European Union, 2014, p. 5-7):

- the presence of discrimination in the workplace;
- different working tasks that are given to men and women;
- various practices that employers provide to men and women regarding their career development and skill training;
- underestimation of the kind work and skills women can develop or already have, and the opportunities to reconcile work and family responsibilities.

Minimum monthly insurance income

The minimum monthly insurance income is introduced in Bulgarian legal framework in 2003. It serves as a basis for calculating the compulsory and voluntary contributions that are made for and by the insured person. For the representatives of female sex social security contributions have an important role in determining the amount of compensations that must be paid by the National Insurance Institute in terms of general sickness and maternity. According to the surveyed women the minimum monthly insurance income is high in the forestry sector. If we analyze that statement on the basis of annually changes of the minimum insurance income it is relevant, because for the period 2010 - 2017 an increase of the minimum insurance income is noted among all qualifying groups of professions employed in forestry sector (see table 2.2). This increase is largely due to changes in the minimum wage during the years. For forestry jobs that do not require special qualification from 2010 to 2013 (inclusive) the amount of minimum monthly insurance income is higher than the amount of minimum monthly wages for the same period. From 2013 to 2017 (inclusive) both indicators are aligned. For the period 2016 - 2017 the amount of the minimum monthly insurance income for skilled workers in forestry is similar to that of the minimum wage for the country. In this basis, the legislature introduces equal insurance relations to the qualified and unqualified staff. In terms of minimum monthly insurance income, fishing and agriculture (covered by sector - "agriculture, forestry and fishing") offers better opportunities than those of forestry for women – managers, specialists and workforce, who does not occupy managerial positions. This conclusion is based on the fact that

for the period 2012 - 2017 the amount of the minimum monthly insurance income for qualified and unqualified staff in fishing and agriculture is higher than in forestry (Social Security Fund Budget Act, Appendix № 1 to Art. 9, para. 1, p. 1, by years).

Table 2.2. Minimum monthly insurance income in forestry, 2010-2017 (BGN)

Years	Managers	Specialists	Technicians and associate professionals	Administrative support	Employed in public services, trade and security	Skilled workers in agriculture, forestry, hunting and fishing	Qualified workers and craftsmen	Machinery operators and assemblers	Professions not requiring special qualifications
2010	621	444	392	380	320	352	392	397	270
2011	655	466	412	400	336	370	411	457	283
2012	684	487	431	418	351	387	429	478	296
2013	700	500	450	430	390	400	440	490	320
2014	750	525	472	451	400	400	450	490	340
2015	780	546	491	469	416	416	468	510	360
2016	900	620	530	480	450	420	520	500	420
2017	900	620	530	480	460	460	520	500	460

Source: Collected from Social Security Fund Budget Act, Appendix № 1 to Art. 9, para. 1, p. 1, per years

The differences of the data from the legislative analyzes and the survey results can be explained with the fact that 67.9 % of the respondents are managers. In this respect the minimum monthly insurance income of the managers in forestry for 2017 is approximately two times higher than the gross national minimum wage for the same period. In addition the insurance income is in a direct link to the wage of the employed persons. In this regard analyzes in the report are only connected to the minimum amounts of the indicators that are taken into account.

The low rates of the minimum insurance income have negative effects to maternity leave and the opportunities for raising a child. In order to increase female participation in the labor market in the forestry sector, it is appropriate and helpful to increase the

minimum insurance income and to bind it to the wages and qualifications of employees. This could help women towards reconciling work, private life and motherhood.

Maternity leave as factor for increasing women's employment

In 2014 employed women in Bulgaria between 20 and 49 years old who have children under the age of 6 are approximately 13.5 percentage points less than employed women without children. This data is above the EU average for the same period (13.2%) (Labor force participation of women, 2015, p.4). It is believed that parenting has a significant impact on female employment (Country report Bulgaria, 2016, p.38), which is a factor that has strong impact on the productivity and competitiveness of the forestry enterprises. Main factors that affects the participation of women with children under the age of 6 in the labor market are: legal rights of women, regarding their rightful maternity leave and compensations for it; access to services related to child care; working hours and the opportunity for part-time work; and working conditions in the workplace.

In accordance to the European legal framework (Council Directive 2010/18/EU), Bulgarian legislation defines the pregnant women and mothers as a risk group, providing them a specific legal protection. In this regard female employees in forestry sector have the right to leave for 410 days due to pregnancy and childbirth for each child (Labor code, article 163). During maternity leave, women are paid compensation, which is 90 % of the average gross wage or the average daily insurance income, on which the social security contributions for a period of 24 calendar months before the month of the maternity leave are calculated. However, the amount of financial support provided by the state and calculated on this basis, is below the necessary parental resources that are needed for raising a child. It is so, because of the fact that the compensations are directly related to the social security income which minimum rates (see table 1) are equivalent or close to the gross national minimum wage. The legislature allows the maternity leave of 410 days to be transferred from the mother to the father who should take care of the child. This provision does not encourage fathers to take maternity leave, despite the fact that the leave is paid and recognized as working experience. Such circumstances can be seen as main reasons women to refuse to terminate their maternity leave and to return to work, despite the low amount of compensation provided by the state for raising up a child⁴.

In Bulgaria for the period 2007-2014 the percentage of women who do not work due to maternity leave or to take care of elderly has increased by 5 percentage points (Labour force participation of women, 2015, p.15.). It should be noted that there is a risk of loss

⁴ The conclusions are based on conducted individual interviews with women, working in forestry sector, who are currently on maternity leave, pending their pregnancy and birth, or parents of children up to 6 years old.

of skills and competencies related to protracted maternity leave (European Commission 2013 Employment and Social Developments in Europe; OECD (2012) Closing the Gender Gap). Because of that childcare services could help mothers to raise their children while working and by that to reduce the percentage mentioned above. However, childcare services in our country are underdeveloped and only 11% of children under the age of 3 attend kindergartens for more than 30 hours per week (Country report Bulgaria, 2016, p.38). This is 23 percentage points below the target of the European Council in this area. Fees of childcare services are identified as the main reason for the underdevelopment in this area. In this regard, fees in Bulgaria for childcare for all-day service for one child in 2012 are approximately 5% more than the net income of a family with two members (Labour force participation of women, 2015, p.18). The lack of childcare facilities is the second most important reason pointed out as a factor negatively affecting the use of such kind of services.

When the maternity leave is over and the mother must return to work she has the rights to offer her employer, for a certain period of time, to change the employment relation in connection to the duration and distribution of working hours (Labor code, article 167, p. b). This legislative rights helps mothers through the adaptation process from maternity leave to perform well on their job. However, part-time work is not a common practice in Bulgaria and less than 5% of employees do not work full-time jobs (Labour force participation of women, 2015, p.5). It should be noted that till now, the awareness of women regarding their legislative rights on issues concerning maternity leave was not an object of reproductive population attitudes study. Because of that, there are no data on women who benefited from the legislature rights for mothers, imposed by the law.

Economic literature claims that a factor indirectly affects competition on the labor market is the reproductive behavior of women (Gencheva, M., J. Marinova, p.70). This behaviour is mainly connected to concerns over the negative impact of workflow and working conditions on the embryo (fetus). In this regard, some possible reasons for miscarriage among women are hard physical labor tasks, presence of harmful working conditions and workplace stress. It should be noted that for the period 2006-2010 accidents in forestry sector are mostly associated with loss of control over the machine, vehicle or forklift trucks; loss of control over hand tools or objects; movement of the body during physical load (normally leading to an internal injury); movement of the body that can lead to fracture, cleavage, sliding, falling, collapsing; slipping or tripping to fall; falling (see table 2.3). However, only small share of employees in forestry sector feels that their health is at risk during work and that their job has a negative impact on their health. In this regard, although there are work accidents reported in forestry sector, there are relatively low rates of absences because of health reasons ("Prevention Safety and Health at Work" job security, life, p.7).

Table 2.3. Major hazards for the employed women in forestry sector

Danger (type/category):	Health issues due to the forestry dangers:
Microclimatic (temperature, humidity, air velocity)	Heat strokes, fatigues and colds
Biomechanical and biological	Physical strains, nervous-mental tension, damages to the bone marrow
Noise (hearing, ultrasonic, infrasound range)	Fatigue and stress, temporary hearing loss, permanent loss of hearing
Electricity, including static electricity	Electrocution burns and unpleasant sensations due to static electricity. Acute effects for the vegetative-vascular system, chronic effects
Fire hazards	Various disabilities on the skin and body depending of the type of the fire (chemical, wood and etc.)
Thermal (high or low object temperatures)	Thermal burns and frostbite due to fire and explosions
Radiation (ultraviolet, infrared, laser)	Impairment of vision, skin damages, blinding chronic effects
Lighting that does not meet the performance requirements	Visual fatigues, a prerequisite for the emergence of other hazards
Chemical	Burnings, respiratory tract damages, irritations (breathing, skin, eyes)

Source: Gencheva, M., J. Marinova

When it comes to risks and factors affecting the health and reproductive performance of women in the forestry sector, the following factors are very important for the females that participated in the survey:

- wood dust;
- outdoor work;
- unfavorable microclimate (temperature, humidity, air velocity);
- biological agents (microorganisms, parasites, bacteria and viruses) and forest animals;
- prolonged walking and/or standing on forest terrain.

As factors that have little or no influence on the state of females' health the surveyed women pointed electricity; static electricity, fire hazard and radiation (ultraviolet, infrared, laser, ionizing).

Based on the conducted individual interviews with women, working in forestry sector, who are currently on maternity leave, pending their pregnancy and birth, or parents of children up to 6 years old, some possibilities could be proposed to minimize the mentioned risks:

1. Employers to provide childcare facilities to their employees, which has an easy access and are not expensive.
2. Employers to provide flexible working hours to women when the maternity leave is over and the mother must return to work. As mentioned this is a legislative right (Labor code, article 167, p. b) but It should be noted that there is no data from the conducted survey that showed women to be well aware of this right.
3. Employers to transfer females that have returned from maternity leave to suitable jobs where there is no outdoor tasks to participate in. Once again this is a legislative right that the surveyed group of women stated are aware of. But the conducted survey showed no data of women who take advantage of this right.
4. Improving women job skills and qualification by providing trainings during the maternity leave or just before the leave ends.

Conclusions and recommendations

As a main conclusion it could be noted that participation of females in the forestry labor market is lower than that of males. Based on the data collected from the survey and the interviews it could be mentioned that there are two main factors that influence over the attractiveness of forestry sector towards women in Bulgaria.

The first one is the payment of the job position. In this respect women do not agree with the statement that they receive salary which is responding to the qualification and efforts they make during the implementation of the job tasks. The surveyed fully agree that additional payment would motivate them to make more efforts in carrying out their duties.

The second one is the minimum monthly insurance income. According to the data collected and analyzed from the survey, women take into account this factor when searching and applying for a job position. In this respect women who have positions as managers in forestry are satisfied with the monthly insurance income they have. According to women, working in forestry sector, who are currently on maternity leave, pending their pregnancy and birth, or parents of children up to 6 years old – they receive

quite a low maternity compensation because of the low insurance income that were paid for them before the pregnancy. By providing childcare services, creating work environment conducive to the maintenance and development of the social status and introducing flexible full-time working hours for mothers, employers can support the balance between women's work and their family obligations. Also it is appropriate during safety briefing on labor safety, some of the lessons to have focuses on women and maternity rights legislation. In particular, females' rights for diferent working conditions and prevention of risk factors that can lead to miscarriage. Such social policies must be disclosed in the non-financial statements and anual forestry enterprises's reports, which would promote and enhance the image of organizations that have adopted them.

In addition, the data from the survey shows that women working in forestry sector express desire to remain on their current position and in the same sector. They do not have fears of losing their jobs but they experience a need for constantly proving themselves and showing their skills at work. The surveyed women do not believe in traditional education as a factor which improves the productivity and development of the sector. In this respect non-traditional long distance learning techniques and online courses could be an appropriate educational form for all workers that must be absent from work for a long period of time. Such trainings must corresponds to the specifics of the job position and the learning style of the person. Because of that, development and implementation of virtual educational platforms (VEP) could be seen as a form of a long distance learning that could benefit all workers that must be absent from work for a long period of time. It would be useful a separate survey to be done of the factors that lead women to disagree about the positive correlation between education and the sector productivity.

From the legislative point of view, it should be noted that despite the process of harmonization between national and European legislation, no substantial progress in women employment in forestry sector, was achieved.

CHAPTER THREE. COMPARISON OF SURVEY RESULTS IN BULGARIA AND MACEDONIA

This parts attempts to identify the potential for developing innovative cooperative initiatives aimed to increase competitiveness in this region. In this respect it examines and compare the state of the art of the business activities in enterprises in forestry sector in both sides of the border applying basic requirements of the Oslo manual for collecting and interpreting technology innovation data.

The study includes all the sectors across the supply chain – forestry and logging, wood, paper and furniture manufacturing and trade sectors in Bulgaria and Macedonia. The aim of the current study is to examine and compare the above mentioned sectors in Bulgaria and Macedonia. This will provide an opportunity for identifying the existing challenges and also some needs and opportunities for cooperation in these sectors in the cross border region. The results will indicate areas for improvement and cooperation between the regions.

Further processing or aggregation of the data has been made in order to allow for making meaningful comparisons between the two countries. All of the data presented on the graphs is in percentages.

1. Profile of respondents

83.7% of the responding employees in Macedonia were male, against 64.3% in Bulgaria. 35.7% and 16.3% of the surveyed people were female in Bulgaria and Macedonia respectively.

In both of the regions, Blagoevgrad and Kyustendil in Bulgaria and Northeastern, Eastern and South-eastern planning regions of Macedonia, the companies in the observed sectors have aging employees. In Bulgaria, the biggest proportion of people who participated in the questionnaire are of the age 51 and above (36.7%). In Macedonia, the greatest share of employees is aged between 41 and 50 (38.3%). Those that are 41-years-old or older are 58.1% of the respondents in Macedonia and 69.4% in Bulgaria.

This could be considered a problem since jobs in the sectors that are observed seem to be unattractive to young people. Both of the regions should try to attract young people to the industries.

Figure 3.1. Gender of the respondents

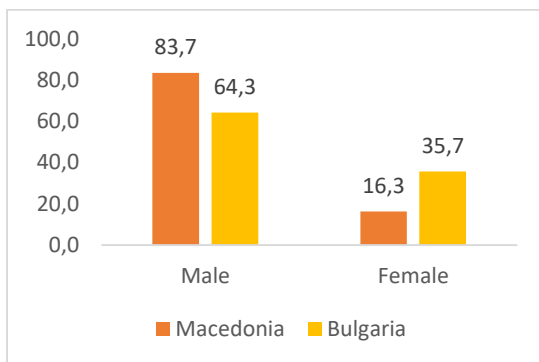


Figure 3.2. Age of the respondents

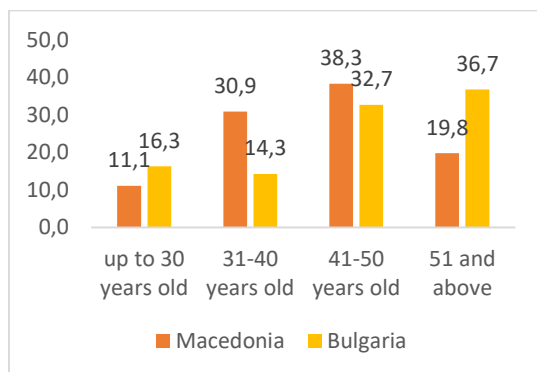
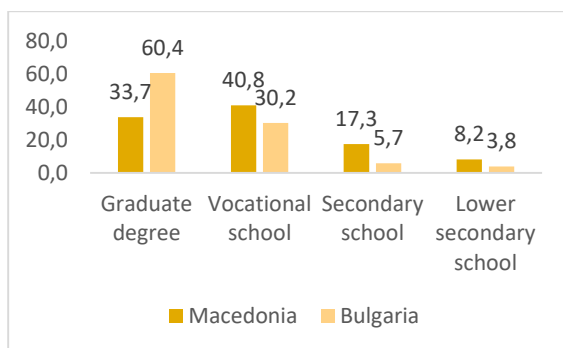


Figure 3.3. Education of the respondents

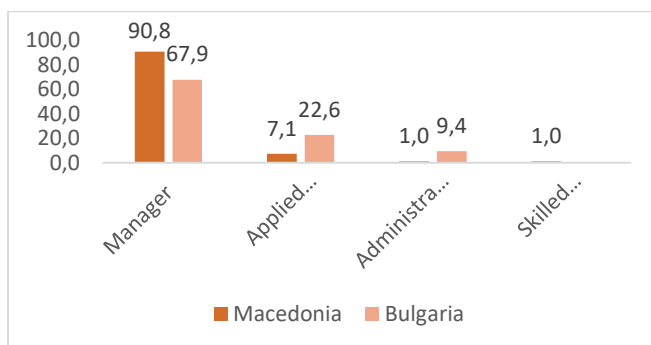


The biggest share of employees in the observed sectors in Bulgaria possesses a graduate degree (60.4% of the interviewed in Bulgaria against 33.7% in Macedonia). In Macedonia, a greater part of the employees graduated vocational school (40.8% against 30.2% in Bulgaria).

Position of people interviewed in the survey

The companies that participated in the survey in both countries were required, if possible, to provide that their managers answer the questions. As a result, the majority of the respondents in both of the regions that were observed are managers (90.8% in Macedonia and 67.9% in Bulgaria). In a smaller number of the cases the people who answered the questionnaires were applied specialists, administrative staff or skilled workers.

Figure 3.4. Occupation in the company of the respondents



Companies' profile

The biggest proportion of companies that took part in the survey in Macedonia were established in the period 2001-2010 (43.9% of them). In Bulgaria, a similar percentage (38.4%) of the enterprises was set up at the same time. 43.9% of the Macedonian firms in the sectors of the study and 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).

All of the surveyed enterprises in Bulgaria were private ones, while in Macedonia 14.3% were public.

Figure 3.5. Economic activity of the surveyed companies under NACE Rev. 2

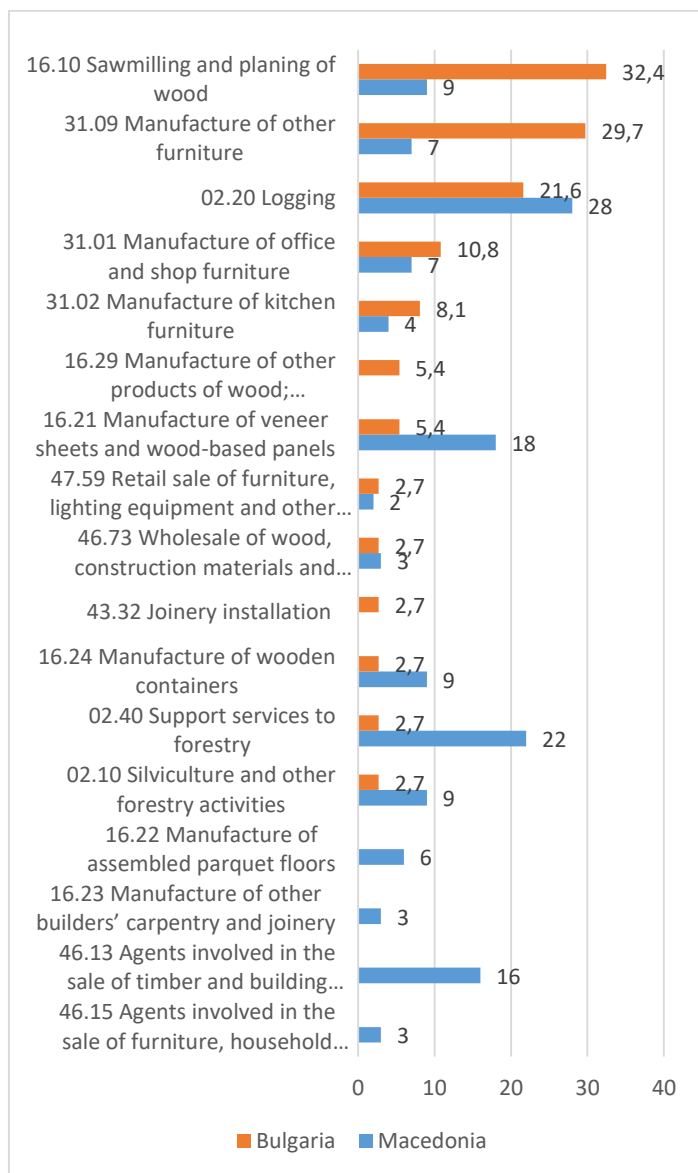


Figure 3.6. Year of establishment of the surveyed companies

Figure 3.7. Ownership status of the surveyed companies

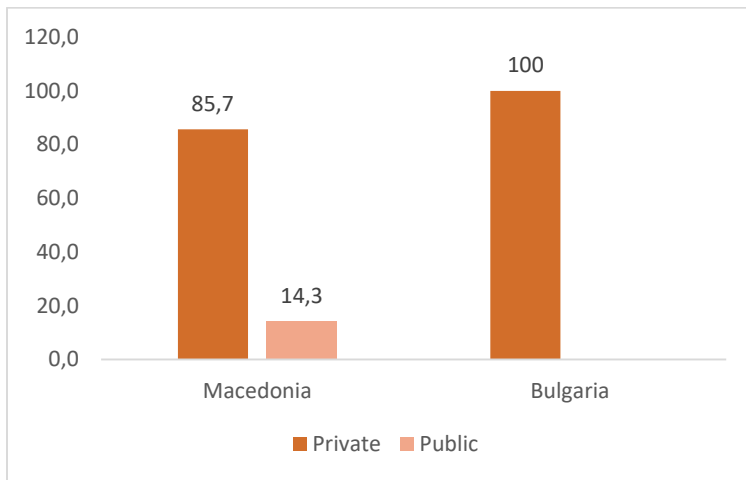
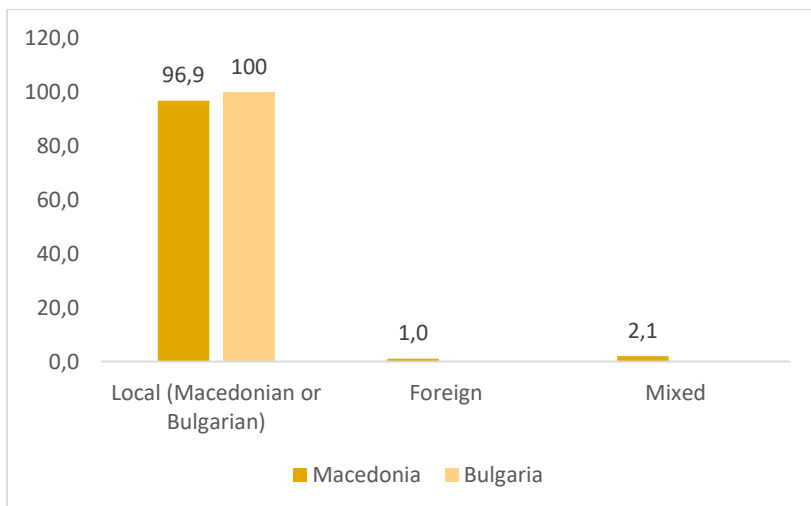
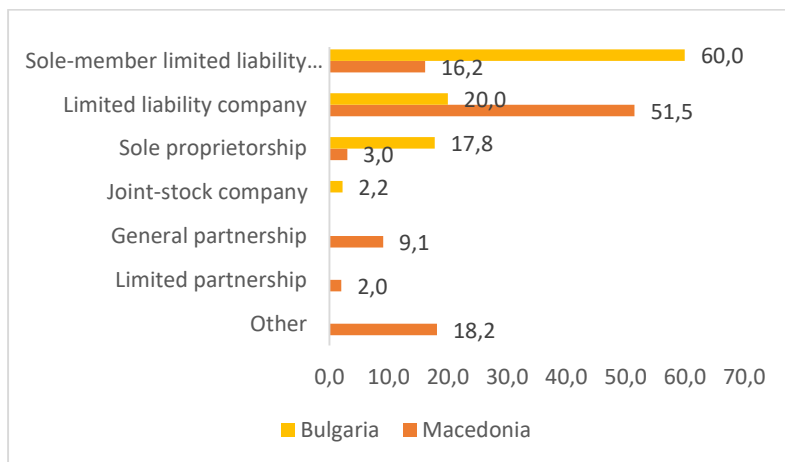


Figure 3.8. Local or foreign ownership of the surveyed companies



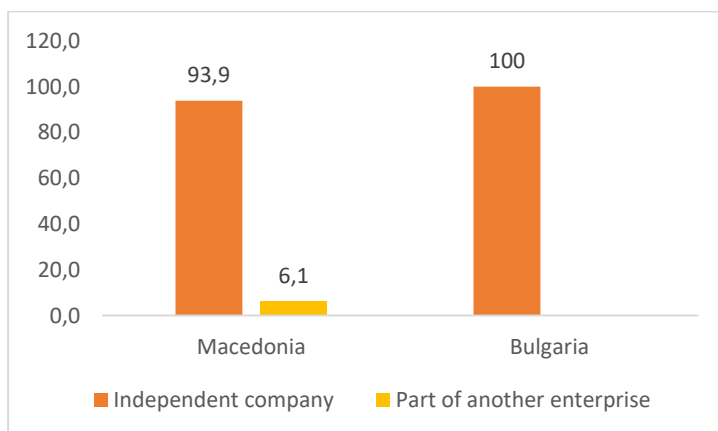
In both of the observed regions, the companies were predominantly local (with either Bulgarians or Macedonians being the owners). In Macedonia, there were some cases of foreign or mixed ownership.

Figure 3.9. Legal status of the surveyed companies



When classified according to their legal status, the organisations in Bulgaria are predominantly sole-member limited liability companies (60%). In Macedonia, 51.5% of the surveyed enterprises were limited liability companies. Since in Macedonia there were public companies, they answered “other” when asked this question.

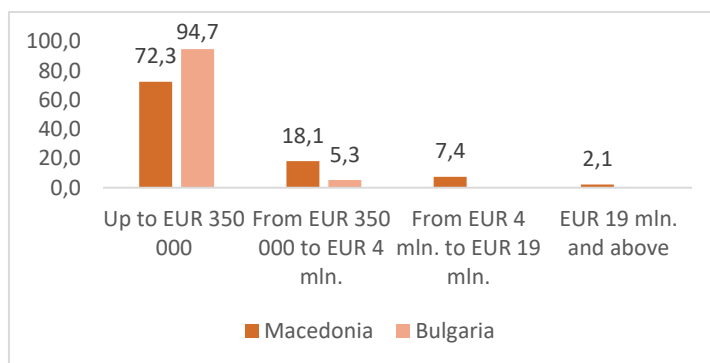
Figure 3.10. Is the company independent or is it a part of a bigger enterprise?



The majority of the organisations in the survey in both countries are independent. In Macedonia, some companies are part of another enterprise.

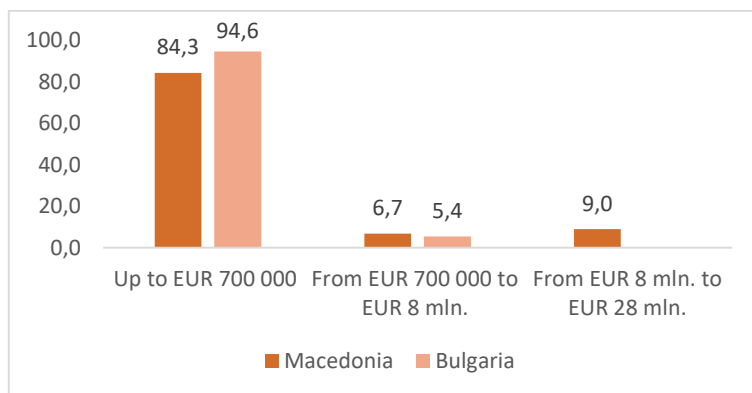
The majority of the businesses in the observed sectors were operating in the years 2014, 2015 and 2016. In Macedonia, those that were not operating were between 2 and 4% of the responding companies and in Bulgaria that percentage varies between 5.3% and 12.2%.

Figure 3.11. Book value of the assets



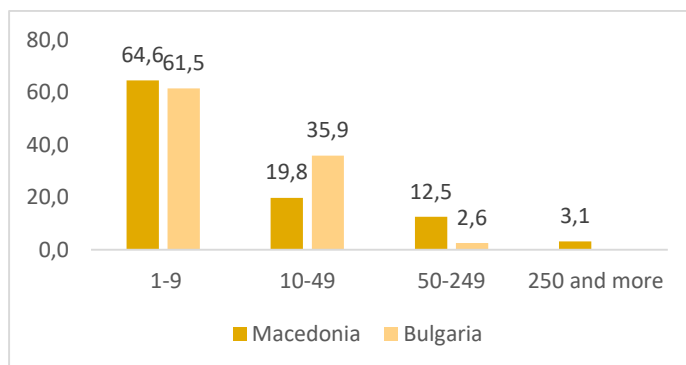
Companies that took part in the study in both of the regions typically have assets whose book value is no more than EUR 350 000 (72.3% and 94.7% in Macedonia and Bulgaria respectively). In Macedonia, 18.1% of the interviewed enterprises have a book value of the assets that is between EUR 350 000 to EUR 4 mln.

Figure 3.12. Net sales revenue



When it comes to net sales revenue, the numbers for both of the observed regions are similar: 84.3% (in Macedonia) and 94.6% (in Bulgaria) of the companies 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 3.13. Average number of employees for the reporting period in the surveyed companies



The observed region has numerous small and medium size enterprises which operate in the wood related sectors of NACE Rev.2 that are subject of the current study. The majority of the companies that took part in the survey in both Bulgaria and Macedonia have 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). The organisations which participated in the study and have between 50 and 249 employees are 12.5% in Macedonia and 2.6% in Bulgaria.

2. Innovation in the sector

The R&D expenses are an indicator of the innovation activity in the businesses. The study showed that most of the companies in the observed sectors in the regions of Kyustendil and Blagoevgrad in Bulgaria and Northeastern, Eastern and South-eastern planning regions of Macedonia spend less than 0.3% of their turnover on research and development. The majority of enterprises in both countries 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 organisations). This means that innovation in the observed sectors is less likely and this reduces the competitiveness, both on the local and international scale, of the firms. Introducing innovations might drive growth in the wood-related industries. Thus, an increase in the spending on R&D might prove to be highly beneficial for the companies in the long run. Therefore, there should be more incentives for the businesses to do research and development.

Figure 3.14. R&D expenses related to the turnover of the company

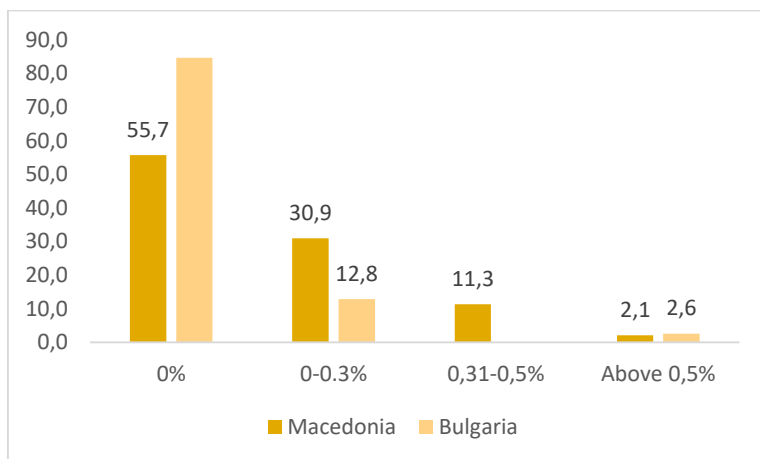
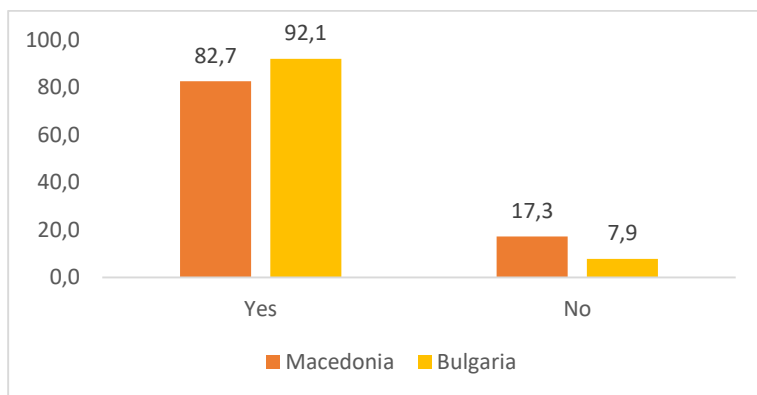
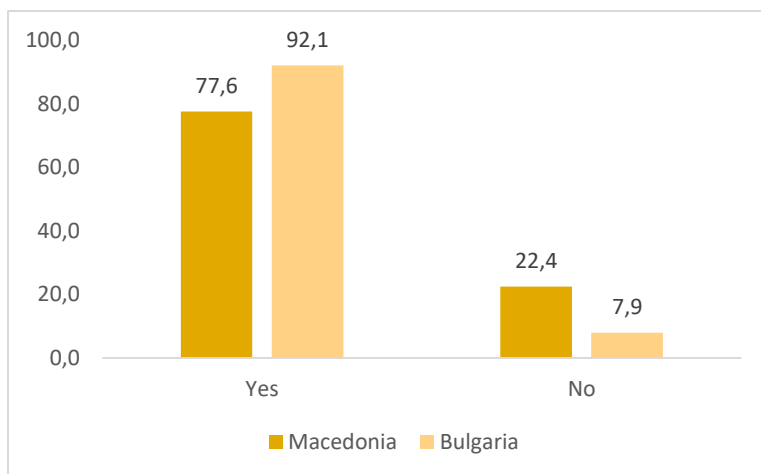


Figure 3.15. Do you use computers in your company?



Predominantly the companies in the observed sectors use computers both in Bulgaria and in Macedonia. In the latter, 17.3% of the enterprises answered that they do not use a computer and in Bulgaria that percent was 7.9%.

Figure 3.16. Do you use the Internet in your company?



The majority of the surveyed businesses in both of the observed regions use the Internet. In Bulgaria, 7.9% of the interviewed companies do not use it, while in Macedonia that percentage is 22.4. Consequently, there is room for improvement: 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 companies which use the Internet in Macedonia and Bulgaria mostly have a fixed or broadband connection (66.2% and 61.8% respectively).

Figure 3.17. If you use the Internet, what is the type of connection?

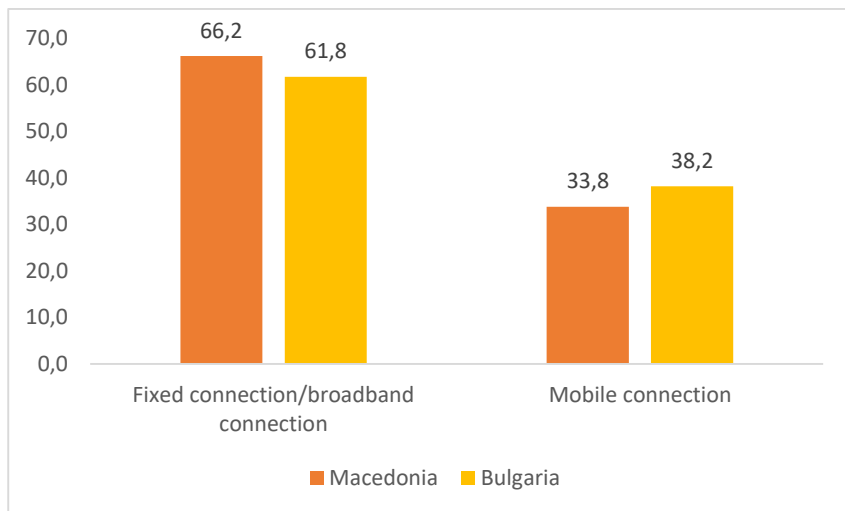
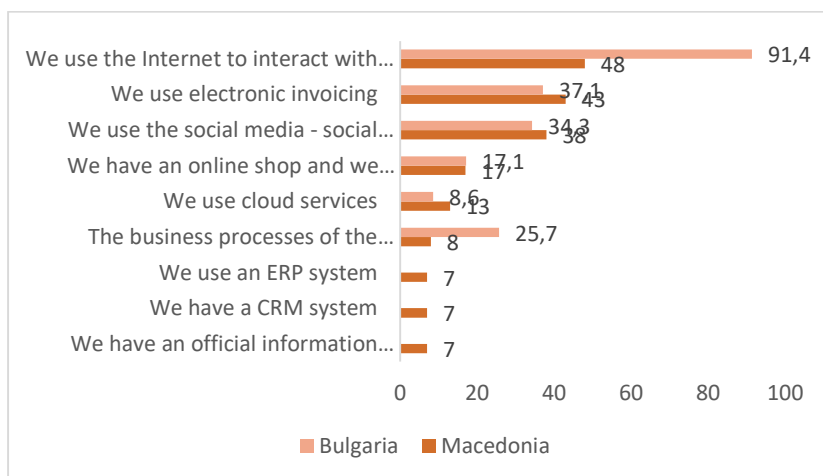
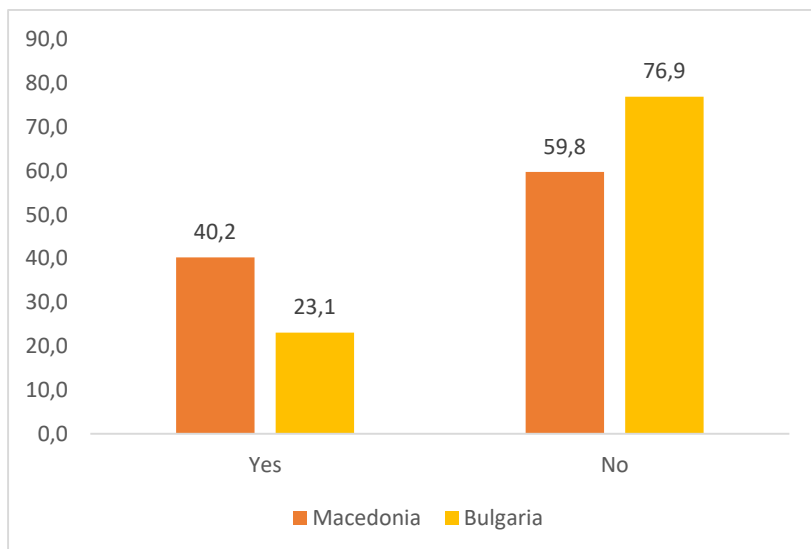


Figure 3.18. If you use the Internet, what do you use it for?



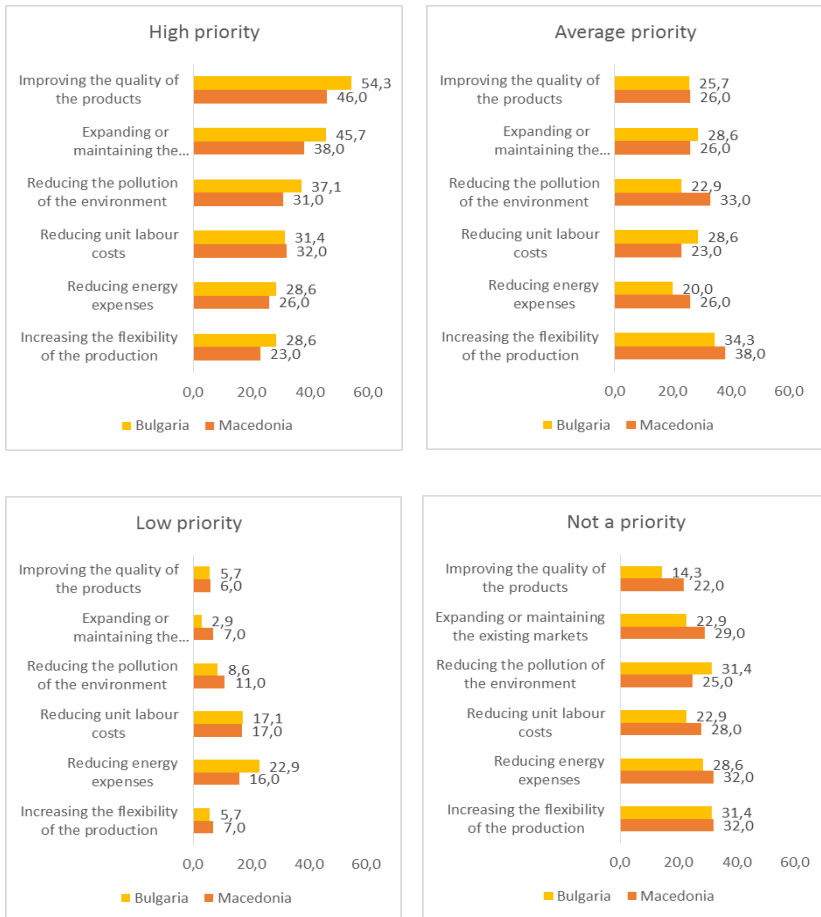
The most widespread use of the Internet amongst the surveyed companies is for interaction with public institutions. This is valid for 91.4% of the enterprises in Bulgaria and 48% of those in Macedonia. Electronic invoicing is another widely used advantage of the Internet, followed by social media and 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 (no respondent answered that they use such in Bulgaria).

Figure 3.19. Do you have a website?



Apart from Internet connection and R&D activities, another problem which the study indicates is that more than half of the interviewed companies, both in Bulgaria and Macedonia, do not have websites. 76.9% of Bulgarian enterprises and 59.8% of Macedonian ones do not have their own website. This could be a major drawback in a digitalized and automated world, where online presence is of crucial importance. Consequently, it could be beneficial for the firms to create their own websites and attract their customers through it.

Figure 3.20. What are the main aims of your enterprise when introducing technological novelties? What priority are they given?



Among the most important aims of the enterprises in Bulgaria and in Macedonia when they introduce technological novelties are:

- 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.

Figure 3.21. What are the main aims of your enterprise when introducing technological novelties? What priority are they given?

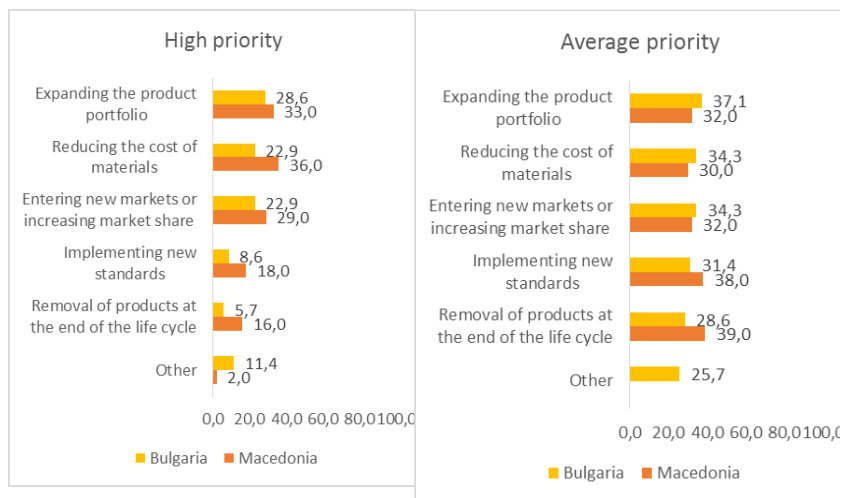
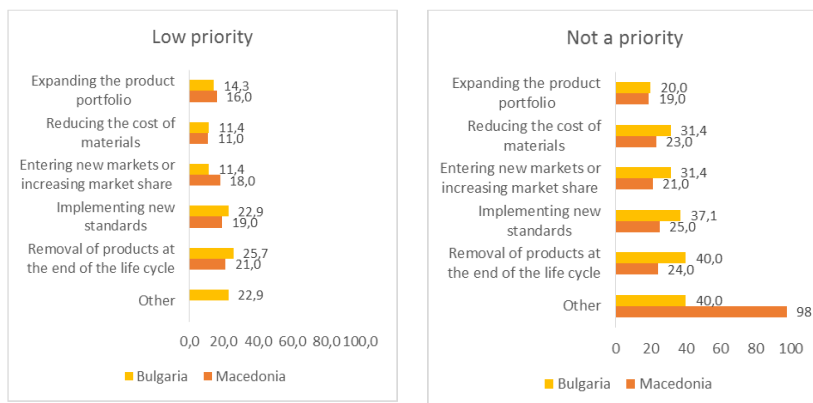
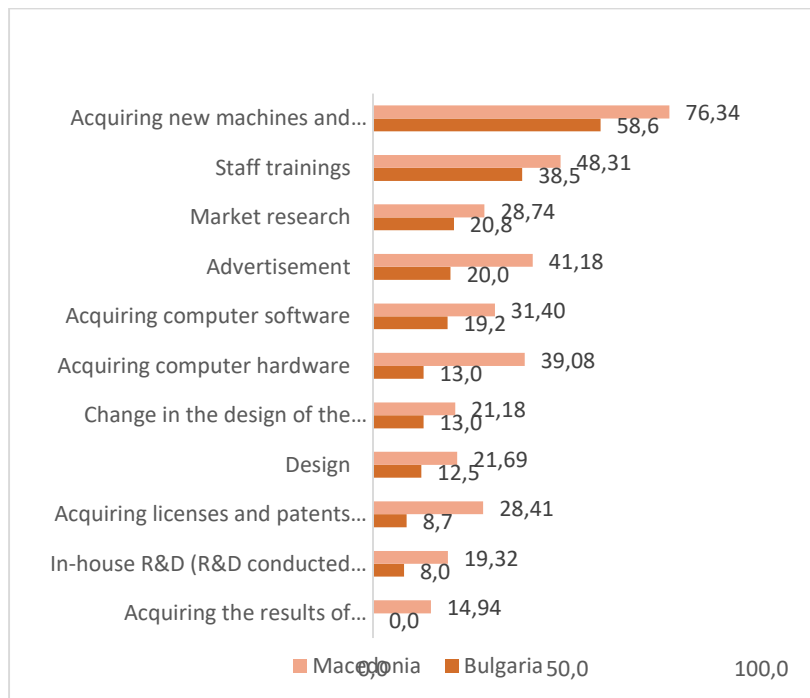


Figure 3.22. What are the main aims of your enterprise when introducing technological novelties? What priority are they given?



Average priority received the expansion of the product portfolio, reducing the cost of materials, entering new markets or increasing market share, implementing new standards and the removal of products at the end of the life cycle.

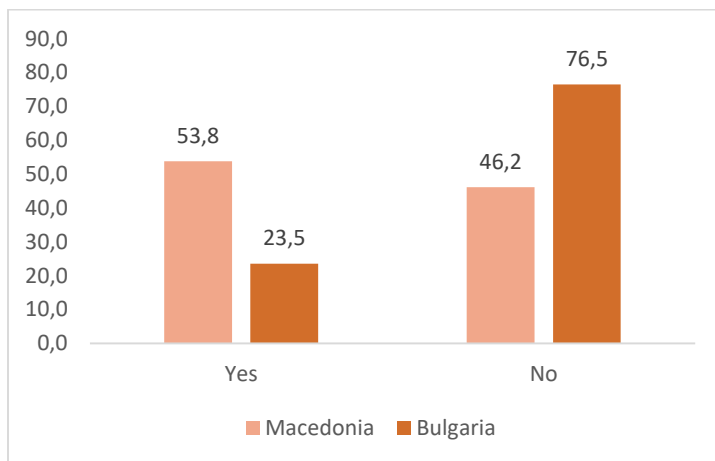
Figure 3.23. Has your enterprise invested in some of the following innovational activities in the period 2014-2016



In the period 2014-2016, about 76% of the enterprises in Macedonia that were interviewed invested the most 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.

In Macedonia, more than half of the organisations 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&DF activities that the companies undertake.

Figure 3.24. Has your company introduced technologically new or modified products in the last three years?



If the 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 3.25. How did you acquire the technologically new or modified product?

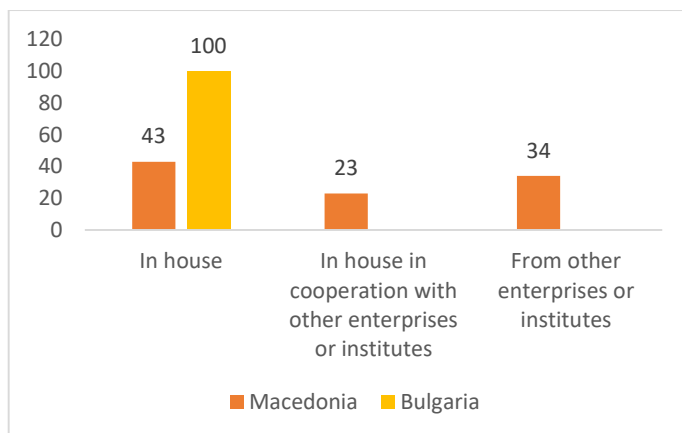
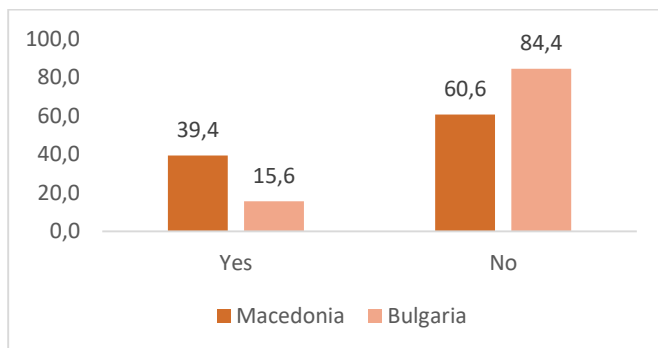
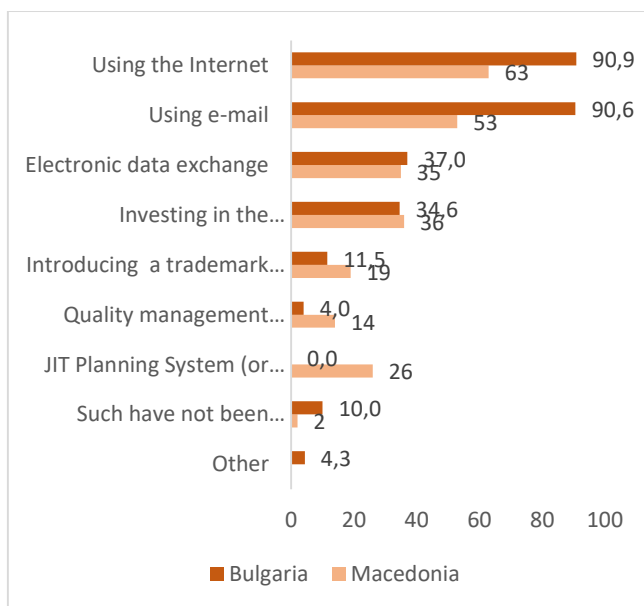


Figure 3.26. Has your company introduced technologically new or modified products, which are also new to the market, in the last three years?



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.

Figure 3.27. Has your company implemented the following organizational changes or new management techniques in recent years?



The organizational changes or new management techniques that happen 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.

The question below reveals the reasons behind the low innovational activities of the firms in the region. The companies in both countries faced setbacks such as cost of 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 3.28. Which were the obstacles to innovating in your company during the period 2014-2016?

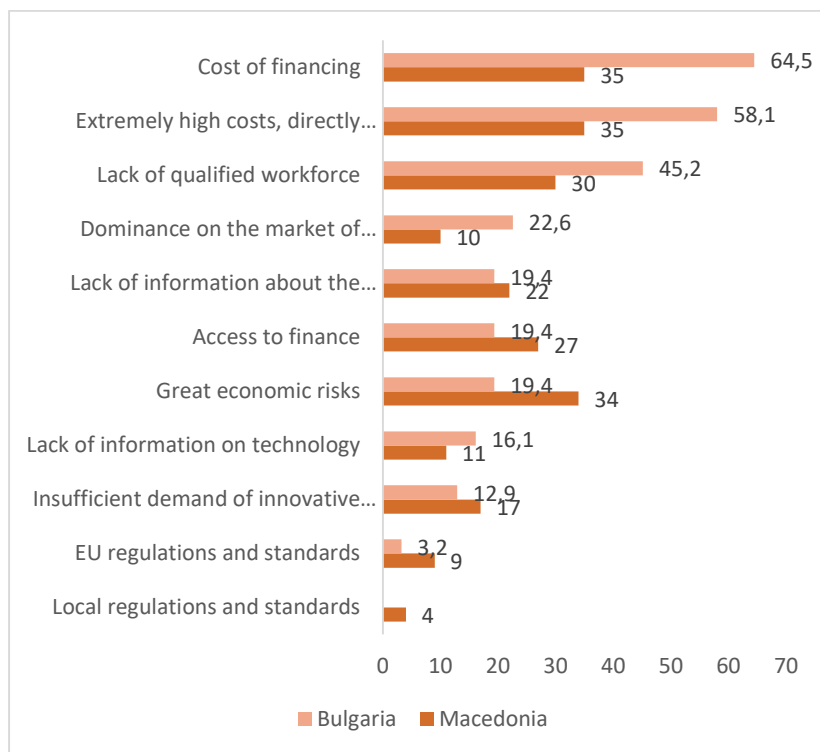
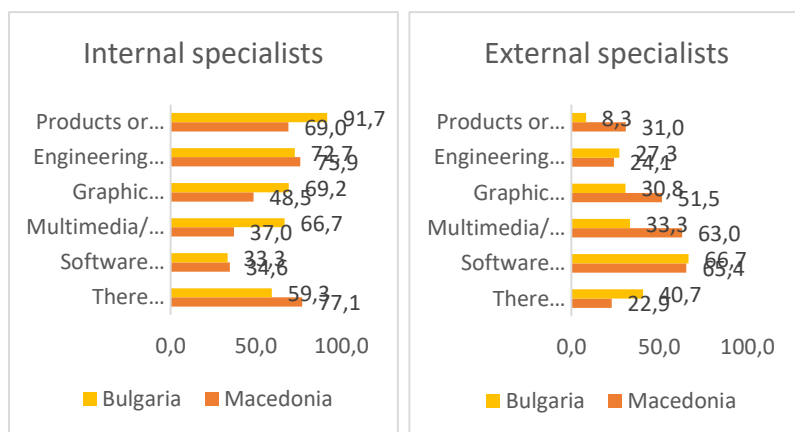
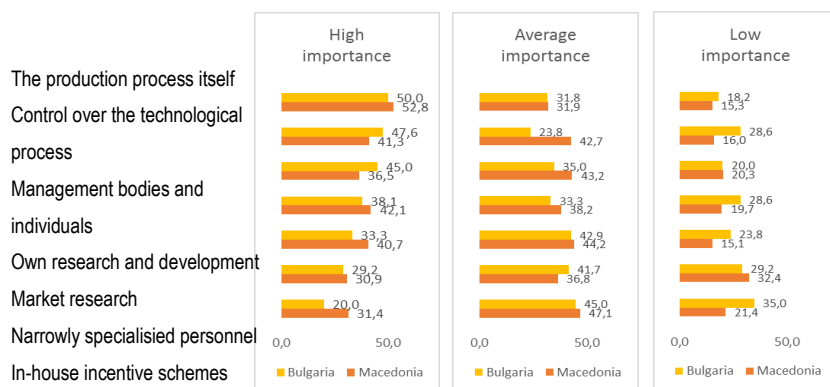


Figure 3.29. During the last three years what specialists have been occupied with the following activities?



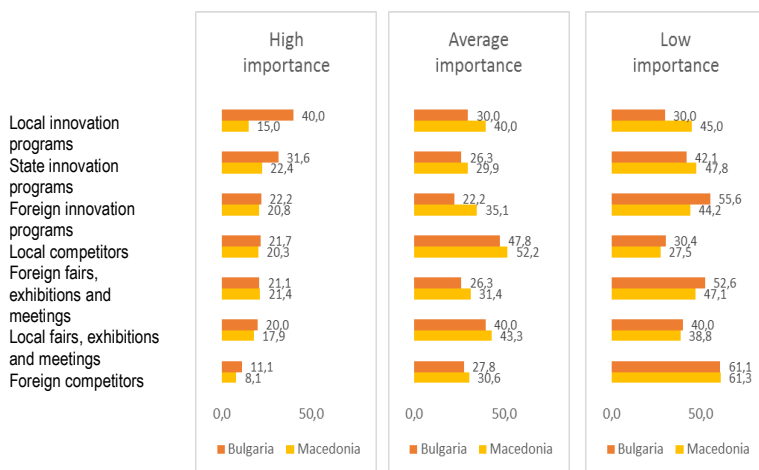
The activities that are related to products or services design, engineering, advertising as well as multimedia, graphic and web design in Bulgarian companies most often include the work of internal specialists. Software development and database management are left to external specialists. In Macedonia, 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 3.30. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



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.

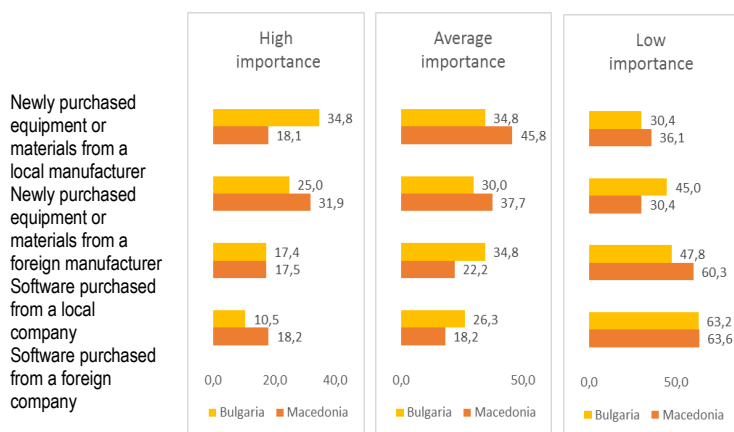
Figure 3.31. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



In Bulgaria, local innovation programs are regarded of high importance by some of the companies. 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.

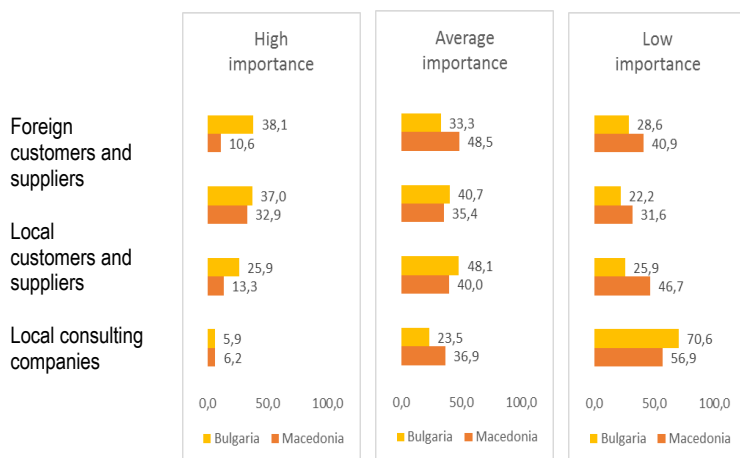
To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

Figure 3.32. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



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.

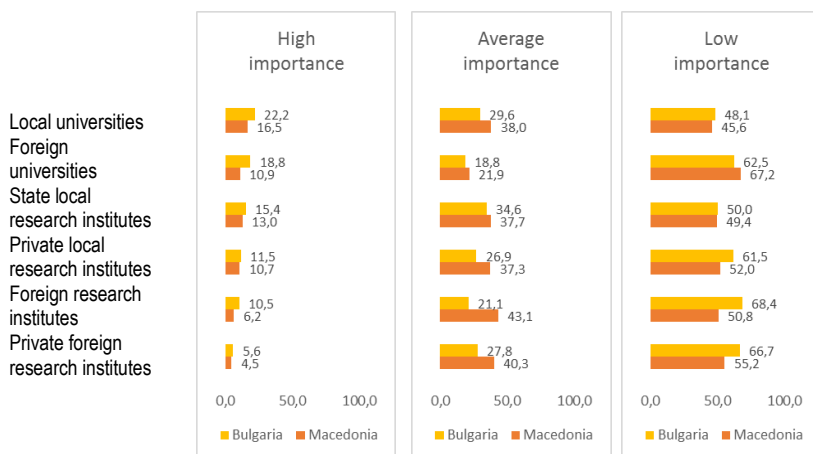
Figure 3.33. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



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. Foreign consulting companies are perceived as an important source of ideas for innovation.

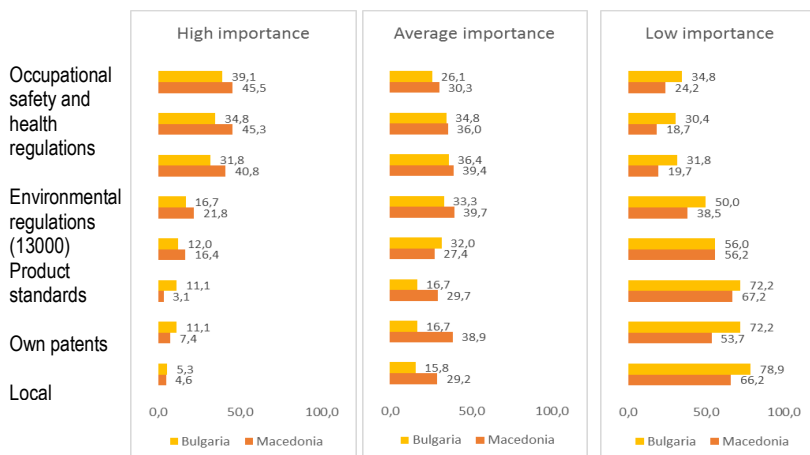
To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

Figure 3.34. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



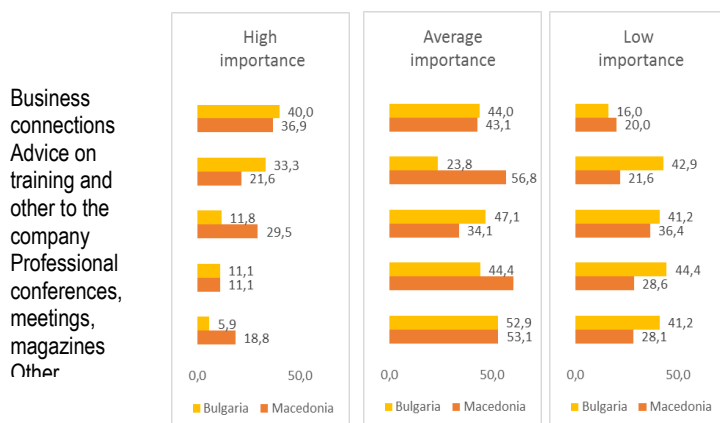
The research institutions are predominantly rated as a source of low importance to the new projects and technological innovations and innovative ideas related to them. This could be attributed to the registered low R&D activities as well as to the low levels of cooperation between the business and the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

Figure 3.35. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?



Companies in Bulgaria and Macedonia indicated that 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 3.36. To what extent are the following sources of innovative ideas important to the new projects and technological innovations of your enterprise?

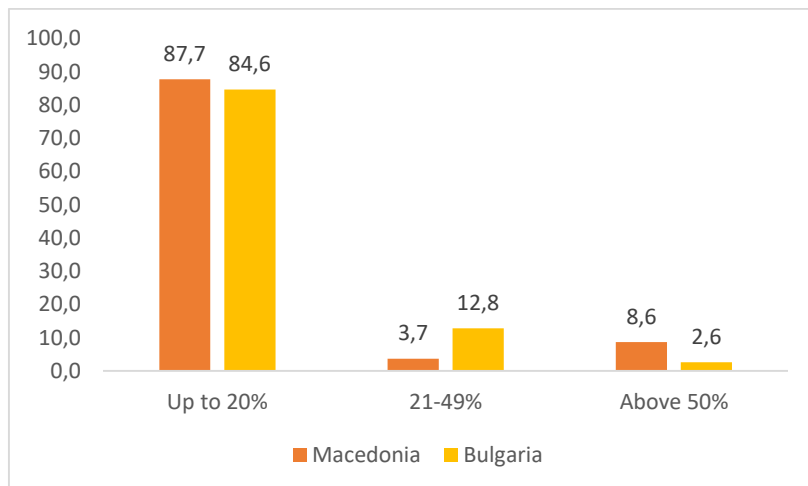


Enterprises that participated in the survey generally believe that innovative ideas might come from their business connections, from advice to the company, from meetings and conferences as well as from trade associations. All those factors were rated as having average importance by approximately half of the firms both in Macedonia and in Bulgaria. This is very strongly related with the idea of the project to create VEP and VOFIS and to make platform for communication and exchange between the companies in the region.

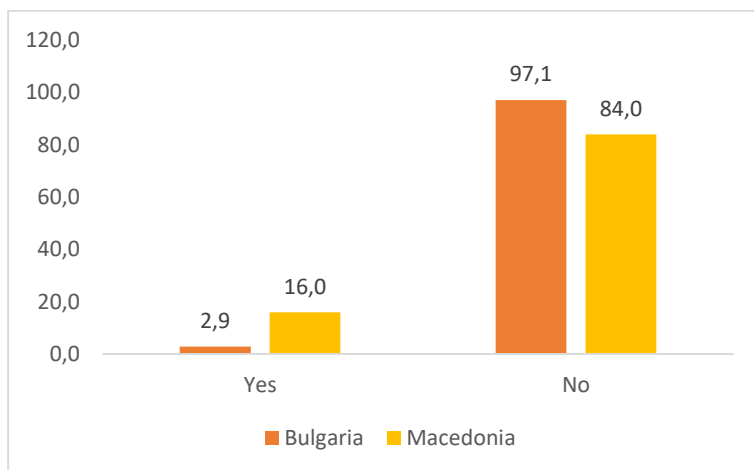
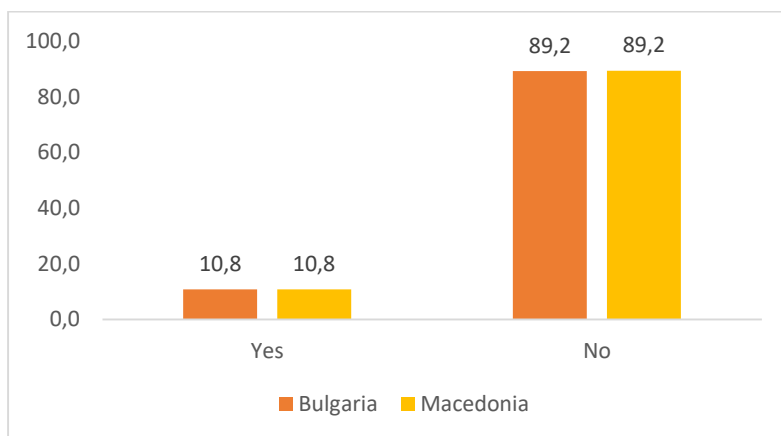
Export intensity

The majority of the interviewed enterprises (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 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 8,6% of the companies from Macedonia that took part in the study equals more than 50% of their turnover.

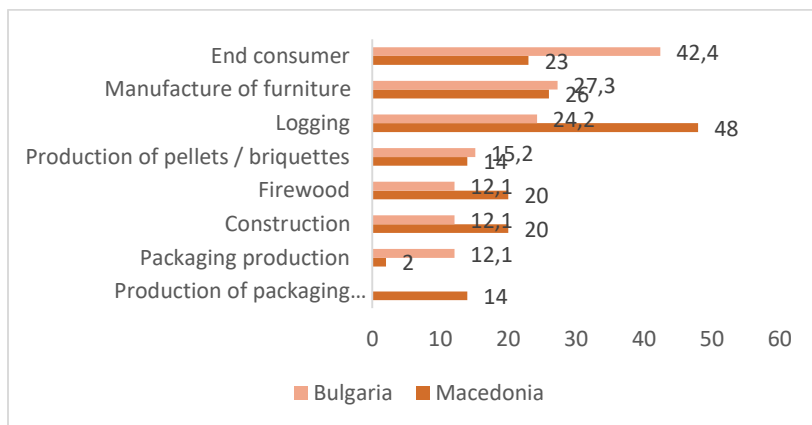
Figure 3.37. Export intensity (export/turnover or export share of total turnover)



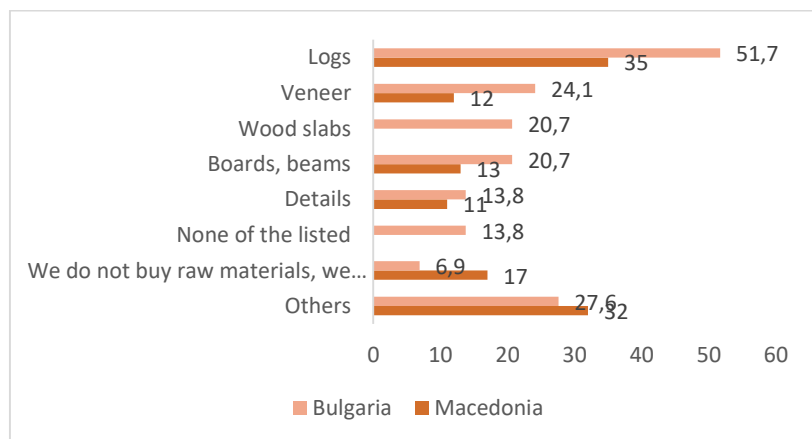
The firms in the survey answered that they do not have suppliers from the neighbouring country: 97.1% of Bulgarian companies do not have suppliers from Macedonia and 84% of Macedonian businesses are not supplied by Bulgarian partners.

Figure 3.38. Do you have suppliers from the neighbouring country?**Figure 3.39. Do you have customers from the neighboring country?**

Approximately 90% of the interviewed companies said that they do not have customers from the neighboring country. 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. The good relations between the two neighboring regions might become a great advantage.

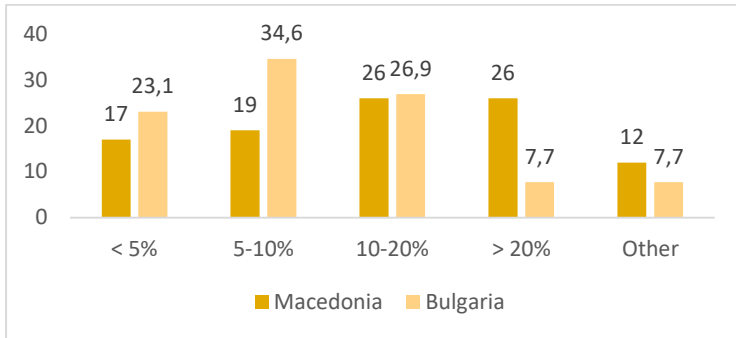
Figure 3.40. Into which of the following categories do your customers fall?

In Bulgaria most of the customers of the interviewed companies are end consumers – 42.4% of the businesses answered that they supply end consumers versus 23% in Macedonia. In Macedonia the majority of enterprises (48%) sell to the logging division. In Bulgaria, 24.2% of the companies that were surveyed do so. In both countries there are many firms (27.3% in Bulgaria and 26% in Macedonia) that sell out to the manufacturers of furniture.

Figure 3.41. What kind of materials does your company buy from suppliers?

Companies in both of the regions most frequently buy logs from their suppliers, followed by veneers and other materials.

Figure 3.42. Delivery costs out of the total production volume

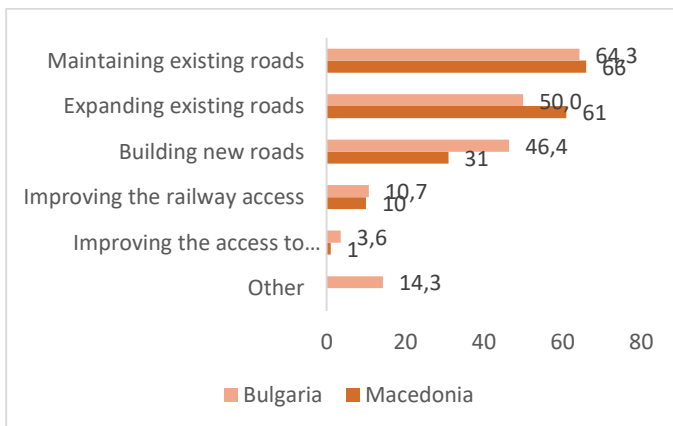


In Bulgaria, 34.6% of the companies have delivery costs that are equal to 5 to 10% of the total production value. In Macedonia, the delivery costs of more than half of the companies are from 10 to more than 20% of the total production value.

Government support needed

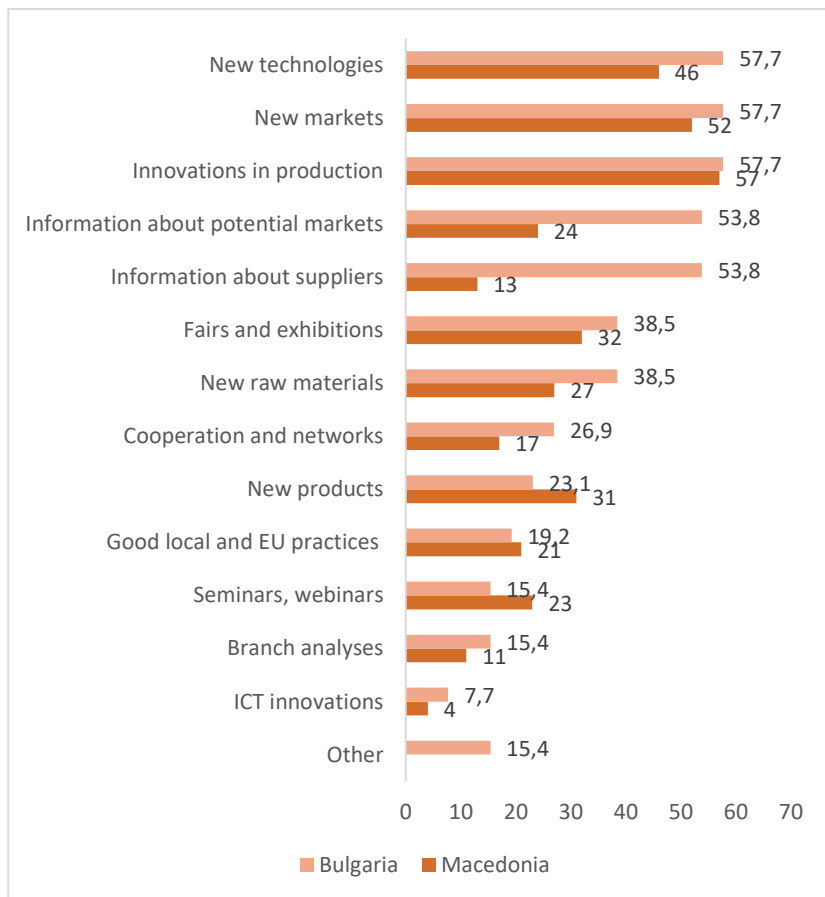
When it comes to infrastructural activities which support the operations of the businesses, the enterprises from both of the observed regions put a higher priority on the proper maintenance of the existing roads or on expanding them. Building new roads is perceived to be of help to the Bulgarian firms.

Figure 3.43. Which of the following infrastructural projects would support the operation of your company?



3. VEP and VOFIS

Figure 3.44. If you had access to a virtual educational platform, what information would you search for?



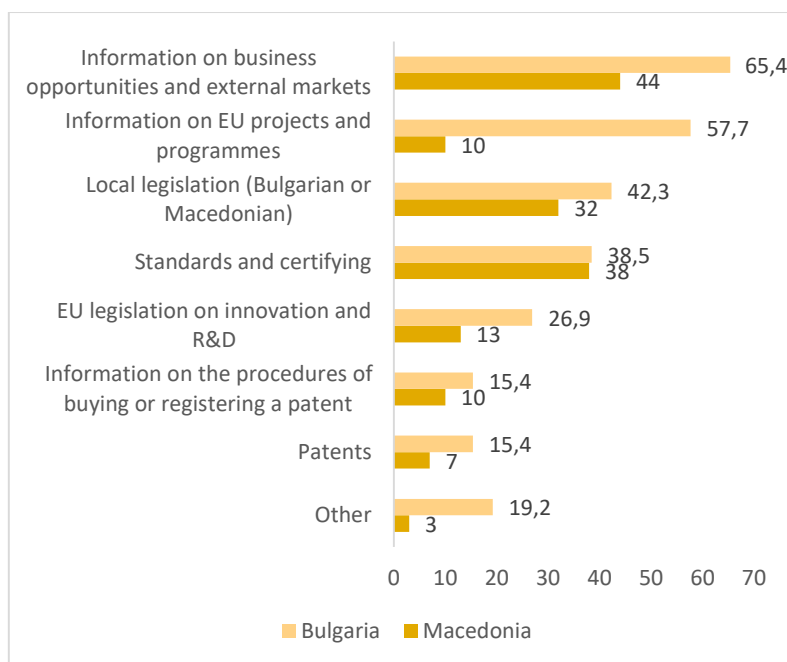
If the organisations in both countries had access to a virtual educational platform, the information which would be mostly searched for would have been:

- New technologies
- New markets

- Innovations in production
- Information on potential markets
- Information about suppliers
- New products

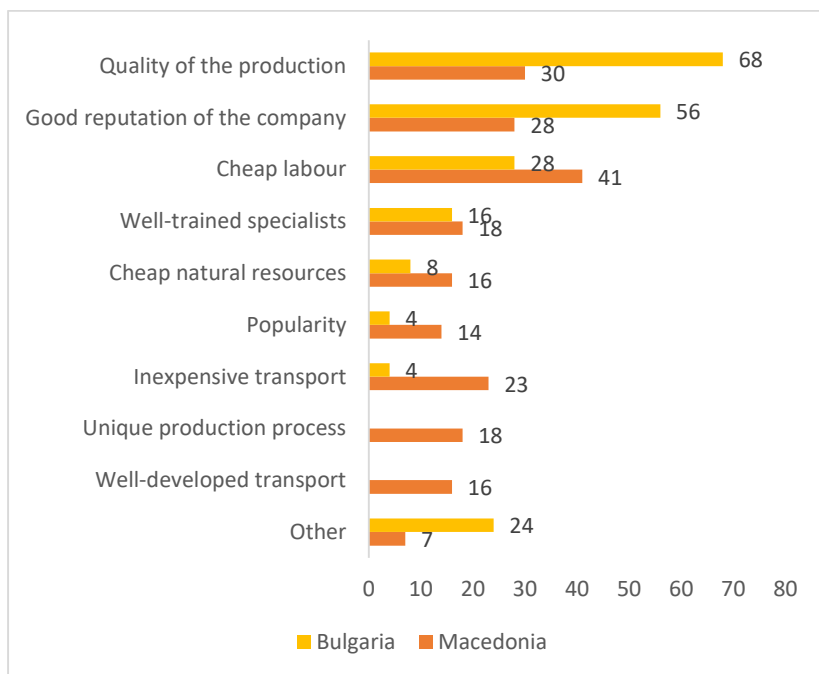
These answers show that there is need of platform where companies in the sector could communicate and exchange ideas, search for potential markets and partners, find new products and new technologies.

Figure 3.45. If you had access to a virtual consulting office, what information would you search for?

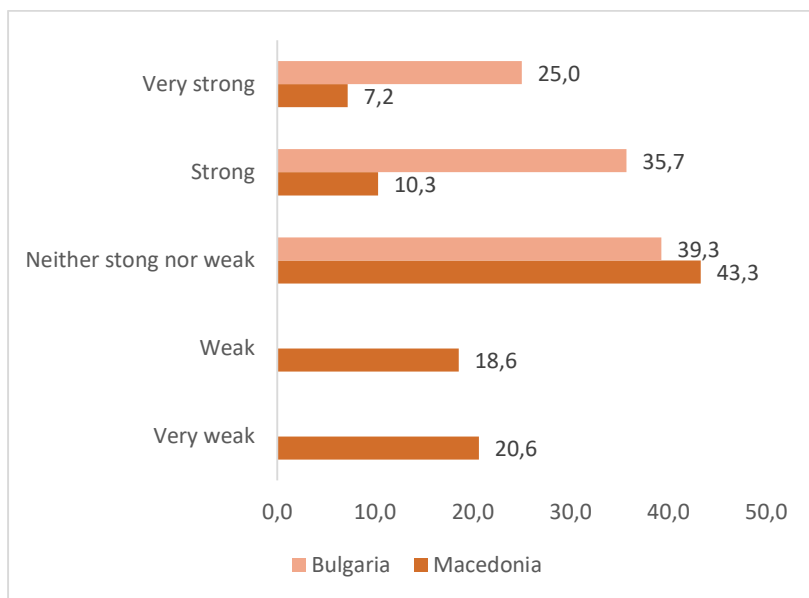


In Bulgaria, a virtual consulting office would receive requests of information on business opportunities and external markets, EU projects and programmes, Bulgarian legislation and standards and certification. Such an office in Macedonia would be asked most often about business opportunities and external markets, standards and certifying and Macedonian legislation.

Figure 3.46. What do you think your competitiveness is based on?

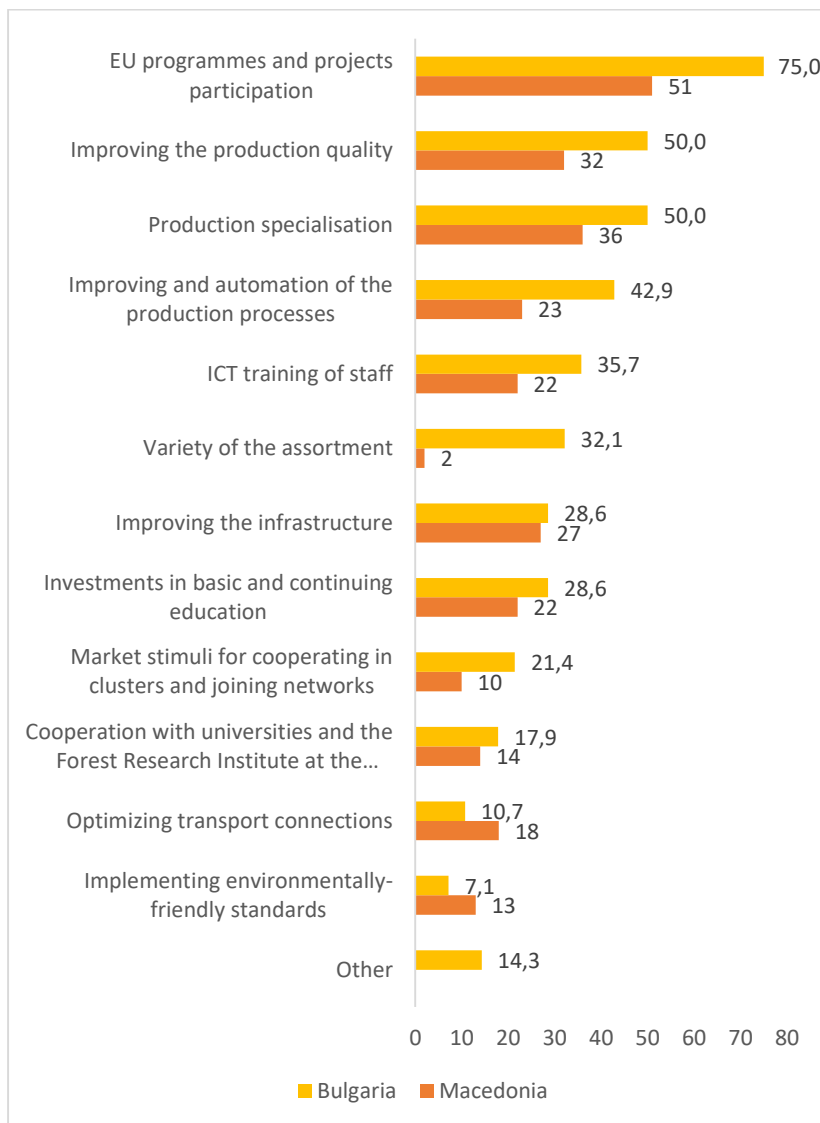


While a predominant majority of the Bulgarian companies consider their competitiveness to be based on the quality of their production and the good reputation of the firm, Macedonian enterprises believe to be producers whose biggest advantage is the cheap labour. Quality of the production and the good reputation of the company are the second and third strength of the business organisations in Macedonia.

Figure 3.47. How strong competition is on the local market?

The majority of the companies that were interviewed in Bulgaria stated that the competition is either “very strong” (25%) or “strong” (35.7%). The rest 39.3% point out that the competition on the local market is “neither strong nor weak”. In Macedonia, 82.5% believe that the competition on the local market is of medium strength, weak or very weak. Competition in Bulgaria is perceived to be stronger while that in Macedonia is perceived to be weaker. Being part of EU Bulgarian producers feel the strong competition while the Macedonian producers still work in less competitive market.

Figure 3.48. What suggestions would you make to increase the competitiveness of the forestry and logging enterprises in regional aspect?



Companies in both of the observed regions answered that, in order to increase regional competitiveness, it would be advisable to:

- Participate in EU programmes and projects
- Improve the quality of the production
- Specialize in some sort of production
- Improve and automate the production processes.

4. Women in the forestry sectors in Bulgaria and Macedonia

In both Bulgaria and Macedonia, most of the interviewed women work full-time. They state that they do not suffer from occupational diseases.

The most important factors that led to choosing the current position, according to Bulgarian women, are the necessity of having a job and that it is well-paid, as well as the high insurance income and that the work is interesting and attractive. In Macedonia, quite similarly, vital for the choice of the current position were the necessity of having a job and that the work is interesting. Apart from those, important were the insurance income, that the job is well-paid and the opportunities for professional education and developing the competences of the employees.

Women in both Bulgaria and Macedonia would prefer to remain at their current position in the same NACE Rev. 2 division. This could mean that they are satisfied with their jobs. In both of the countries, the interviewed women are contented with the labour conditions of their organization. The respondents in Bulgaria and in Macedonia assess positively the remuneration, the way their salaries are formed and the correspondence of the work done to the salary. However, there is a slight disagreement that the wages correspond to the qualifications of the employees in both countries. Bulgarian and Macedonian women in the forestry sector agree that improvement of the labour conditions as well as additional remuneration would motivate them and increase their productivity.

In Macedonia, the majority of the interviewed women are informed on their rights regarding the protection from discrimination at the workplace, equal remuneration of men and women and access to education. In Bulgaria, the women are either fully or partially informed on that.

When it comes to career and competencies development, women in Macedonia are mostly concerned with the lack of career development prospects, losing their job, losing some of their competencies after their maternity leave, the quality of their work and

showing their potential, working overtime, whether they get on well with their colleagues at work and whether their opinion is respected. In Bulgaria, getting along with colleagues and respecting one's opinion are not seen as problems. The biggest concerns there are related to losing one's job, the quality of work and showing one's potential. In both of the regions, women are less worried about combining educating of their children with their job, gender discrimination or going back to work before the maternity leave is over.

In Blagoevgrad and Kyustendil as well as in the North-eastern, Eastern and South-eastern planning regions of Macedonia there are no specialized programs or courses which focus on the improvement of the skills of women. Bulgarian women believe that more trainings would not lead to greater productivity in the forestry sector. In Macedonia, on the contrary, it is thought that trainings would really make the employees in the sectors that we observe more productive.

The challenges faced by women in Bulgaria are mainly related to competition and the need to prove yourself.

The factors that influence the health of women in the sector in Bulgaria are wood dust, outdoor work, unfavourable microclimate (temperature, humidity, air velocity), biological agents (microorganisms, parasites, bacteria and viruses) and forest animals, as well as prolonged walking and / or standing in forest terrains. Factors that have little or no influence on the state of health include electricity, static electricity, fire hazard, radiation (ultraviolet, infrared, laser, ionizing). In Macedonia, the major risks to the health of women are caused by using or maintaining the specialized machinery, fire hazard, wood dust, noise and vibrations and outdoor work. Electricity and lighting, biological agents, repetitive movements, prolonged walking and standing in forest terrains, working posture and radiation are perceived to be less dangerous.

Women in the observed NACE Rev. 2 sectors in both of the countries do not spend time outside during their workday.

5. Key findings

The majority of the companies in the sectors observed are small and medium sized companies. Their turnover 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 single-member limited liability company or limited liability company.

The study showed that most of the companies in the observed sectors in the regions of Kyustendil and Blagoevgrad in Bulgaria and North-eastern, Eastern and South-eastern

planning regions of Macedonia spend a small amount of money from their turnover on research and development (less than 0.3%).

This means that innovation in the observed sectors is very low and this reduces the competitiveness, both on the local and international scale, of the firms. Introducing innovations might drive growth in the wood-related industries. Thus, an increase in the spending on R&D might prove to be highly beneficial for the companies in the long run. Therefore, there should be more incentives for the businesses to do research and development.

The share of companies in both regions that use computers and Internet is high (above 78% in Macedonia and above 90% in Bulgaria), but still a lot of companies do not have web sites (60% in Macedonia and 77% in Bulgaria). 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.

Usage of new technologies could be a major drawback in a digitalized and automated world, where online presence is of crucial importance. Consequently, it could be beneficial for the firms to create their own websites and attract their customers through it.

Among the most important aims of the enterprises in Bulgaria and in Macedonia when they introduce technological novelties are:

- 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.

In generally the cooperation levels between both countries across boarder region are low and thus companies would like to increase the cooperation and to contribute in the innovation process.

If the organizations in both countries had access to a virtual educational platform, the information which would be mostly searched for would have been:

- New technologies

- New markets
- Innovations in production
- Information on potential markets
- Information about suppliers
- New products

The survey shows that there is need of platform where companies in the sector could communicate and exchange ideas, search for potential markets and partners, find new products and new technologies.

Companies in both of the observed regions point out that, in order to increase regional competitiveness, it would be advisable to:

- Participate in EU programs and projects
- Improve the quality of the production
- Specialize in some sort of production
- Improve and automate the production processes.

The potential and willingness for cooperation and cooperative initiatives is high and if it is developed the effect for all sectors across the supply chain will be positive in both regions.

CONCLUSIONS

The availability of resources as well as positive attitudes towards cooperation determine good prospects for development of the forest sector in the cross-border region between Bulgaria and Macedonia. On the other hand, research has shown that the current level of competitiveness and innovativeness of enterprises in this region is low. In the present state, there is no potential for it to increase, which is an important problem in the development of the region. The problem with the prospect of deterioration of the competitiveness potential of enterprises from Blagoevgrad and Kjustendil regions in Bulgaria and the North-Eastern, Eastern and Southeastern regions of Macedonia is determined by:

- Overcoming the crisis globally and the growth trends of the forestry sector based on the introduction of novelties such as nanotechnology. On the other hand, the forest sector in the region is characterized by too little renovation, unsatisfactory infrastructure, lack of significant working links with research institutes and other sources of innovative ideas.
- Globally, competitiveness is determined not by competition between products as between supply chains. On the other hand, the observed regional fragmentation and the low level of connectivity between enterprises in the supply chain and in innovation networks.
- Enhancement of larger enterprises to be more innovative and competitive than small ones. It is confirmed by the results of the survey of the enterprises in the region. The poor prospect is determined by the predominance of mostly sole traders or micro-enterprises that do not have enough financial, information and human resources needed to upgrade their business.

The solution proposed here to improve the current poor level of competitiveness in the cross- border region is based on the use of the latest scientific advances in the field of operational management and, above all, supply chain management, as well as on application of information and communication technologies. On the other hand, it is based on people's positive attitude towards a joint business. On the third place the proposed solution is based on a summary of the proposals made by representatives of the region's businesses during the survey. The suggested solution of the problem is practically applicable – two virtual platforms:

- Joint Bulgaria-Macedonian Virtual Office (VOFIS) for consulting forestry companies and forest-based industries in the cross border region;

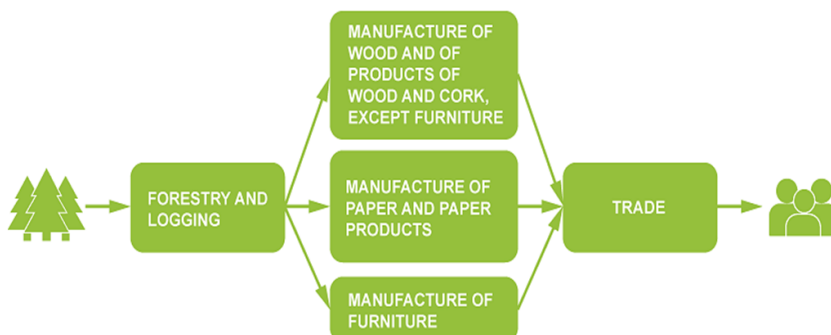
- Virtual Educational Platform (VEP) for workers, learners and all interested in the development of the forestry sector.

The services offered by the joint virtual office include opportunities to speed up communication and provide the necessary information for:

- All forest enterprises in the Blagoevgrad and Kyustendil regions in Bulgaria and in the Northeastern, Southeastern and Eastern regions of Macedonia according to official sources of activity codes grouped according to the place in the supply chain and with e-mail quotation;
- site-listed enterprises grouped in their place in the supply chain.

On this basis, new collaborations can be initiated by selecting partners according to their location and subject matter, defining their place in the supply chain, schematically presented as follows:

Figure.1. Styled representation of key supply chains in the forestry sector



Links with the main organizations in the innovation network of the country and the European Union can be established by using the published structured database of useful links for other innovative partnerships with educational, research and governmental and non-governmental organizations in the border region; national and international funding programs; opportunities for consultation.

Among the links are:

EUROFOREST Portal – Associations

EUSTAFOR – European State Forest Association

CEPF – Confederation of European Forest Owners

CEPI – Confederation of European Paper Industries

EOS - European Organisation of the Sawmill Industry

The Virtual office provides links to over 130 international industry organizations as well as consults business start-up and funding sources. The Virtual learning platform (VEP) offers the following services:

- Different categories of courses
- Information on new technologies and products, standards and certification in the forestry sector
- Self-training courses
- A library of scientific publications and films on the subject

For acquaintance with the state policy, contacts are made between the municipalities in the border regions of Macedonia and in the border regions of Bulgaria. For beginners, there is information about what they represent and how to make financial statements.

The Virtual Office, together with the Virtual Educational Platform, is the implemented practical instrument, which offers conditions for improving competitiveness through joint innovative initiatives on the cross-border region. The achieved results in the project creates new horizons for future research.

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ANNEX 1. DEFINITIONS AND CLASSIFICATIONS

Forestry sector – scope of activities

Forestry sector includes forestry and wood-working and furniture industry (wood-working and furniture manufacturing), also called Forestry industry.

Forestry is a branch of the economy that aims to manage a part of the natural resources – forests.

Logging is the activity of harvesting wood. In forestry, the term covers separate activities such as cutting, primary site processing, towing and / or loading of harvested timber (logs and logs) in vehicles, transported out of the wood, usually to sawmills or timber warehouses.

Forest industry includes activities on wood-working and furniture manufacturing, related to manufacturing 3 from timber, included in the final product – furniture.

Woodworking includes activities on processing the raw timber like cutting out, planing away and impregnating timber, manufacturing products from wood, cork, veneer and wood boards, parquet boards, joinery and products from wood for construction, wood-wrapping from wood, and other. The products of the woodworking enterprises is a main material in the furniture manufacturing and this places the furniture on focus as an end product and a result of wood-processing and furniture industry.

Furniture manufacturing includes different stages till the manufacture of the end product – furniture. The latter is differentiated as furniture for public and furniture for home. Furniture for public is made for schools, banks, hotels and restaurants, offices, institutions, etc. Furniture for home is made for different functional zones of the homes – for kitchen, bedroom, dining room and bathroom. Furniture industry is specified also by an increasing significance of the rights of the consumers of furniture. This places the distinctive advantages of the furniture enterprises in EU on focus. They realize that in order to manage the competitive pressure they have to focus on their main skills to help them increase the added value, while the other services and products will be provided by the best subcontractors and suppliers. In practice, the possibilities are two:

- Product diversification: manufacturing a wide range of products (for example upholstered furniture, office furniture);

- Product specialization: focus on concrete product in many types and different colours, carrying out finishing activities, using various materials, colours and sizes (for example manufacturing of only upholstered furniture).

Furniture manufacturing includes several main components, on which depend its specification, scale, results. The used technology in the enterprises is a complex of materials, manufacturing machines, means for working the materials, information systems. The fast delivery and post-sale service are mandatory requirements of all buyers today. The integration of the manufacture and design of furniture decreases the necessary areas and saves space.

According to NACE.BG-2008, economic activities in Forestry (02) and Forestry industry (16, 31) in Bulgaria are:

- Division 02 Forestry and Logging
 - 02.1 Reproduction of forests
 - 02.2 Logging
 - 02.3 Collecting wild and non-wood products
 - 02.4 Support services to forestry
 - Division 16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
 - 16.1 Sawmilling and planing of wood
 - 16.10 Sawmilling and planing of wood
 - 16.2 Manufacture of veneer sheets and wood-based panels
 - 16.21 Manufacture of veneer sheets and wood-based panels
 - 16.22 Manufacture of assembled parquet floors
 - 16.23 Manufacture of other builders' carpentry and joinery
 - 16.24 Manufacture of wooden containers
 - 16.29 Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
- And
- 43.32 Joinery installation
 - Division 17 Manufacture of paper and paper products
 - 17.11 Manufacture of pulp

17.12 Manufacture of paper and paperboard

17.21 Manufacture of corrugated paper and paperboard and of containers of paper and paperboard

17.22 Manufacture of household and sanitary goods and of toilet requisites

17.23 Manufacture of paper stationery

17.24 Manufacture of wallpaper

17.29 Manufacture of other articles of paper and paperboard

- Division 31 Manufacture of furniture

31.0 Manufacture of furniture

31.01 Manufacture of office and shop furniture

31.02 Manufacture of kitchen furniture

31.03 Manufacture of mattresses

- Division 46 Wholesale trade, except of motor vehicles and motorcycles

46.13 Agents involved in the sale of timber and building materials

46.15 Agents involved in the sale of furniture, household goods, hardware and ironmongery

46.47 Wholesale of furniture, carpets and lighting equipment

46.65 Wholesale of office furniture

46.73 Wholesale of wood, construction materials and sanitary equipment

and

47.59 Retail sale of furniture, lighting equipment and other household articles in specialised stores

Covering the entire process from harvesting wood to manufacturing concrete furniture, the working stages from obtaining to the final product include:

1. Logging

- Extraction of woody raw material (round wood)

2. Wood processing

- Production of faced materials (boards, beams, details)

- Production of slate materials (LDF, MDF, OSB)

- Production of plywood
 - Production of veneer
 - Production of joinery
 - Production of wrapping
 - Production of packaging, etc.
3. Production of furniture
- Production of home furniture
 - Production of furniture for public spaces

The technical-economic specifics of the Forestry industry are (Grigorov, 2008):

- The main raw material used in the woodworking manufactures is timber.
- The timber goes through mechanical working, which in the productions of boards, plywood, laminated wood, etc. is combined with chemical working.
- Low transportability of the raw materials, materials and products based on timber.
- Significant quantities of timber waste accompanying the different stages of woodworking and the degree of their use.
- With the repeated participation of timber at the different stages of the technological processes for mechanical working with the quantity of added labour to the process of manufacture, its economic value increases.

The types of productions in the Forestry industry are related to the ways of working of the raw timber or timber-based materials, production technology, specifics of the type of production. Operations concerning the working stages in the Forestry industry include: logging; cutting; drying; planing; pressing; milling cutting; drilling; veneering; grinding; edging; varnishing; etc. In the production of low density fragments (LDF) and medium density fibreboard (MDF), where the way of working the timber is through pressing no matter the scale of the production powers, their production is mass and the organization form is line production. In cases of mass production, like LDF and MDF, the consumers have no influence, their influence is already at later stage of refining the boards – laminating (mat or gloss), masking, veneering, varnishing, etc. (Grigorov, 2008).

Productions of plywood and veneer have the same specifics and organization form of line production. The differences are determined rather by the thickness and type of manufactured production. For example plywood can be waterproof, fireproof, technical, etc., but this does not change its mass production. Same refers to veneer.

When the woodworking processes are by cutting, as are most of the operations in the wood-wrapping production, the cutting technology of the woody raw material is determined depending on the type of basic machine used in the production process: gaffer, block-saw, milling machine, circular saw blades, combined bands, combined. Typical of wood-wrapping production is that, unlike, from the production of furniture or windowwork, its production can not be assigned to any type of small, medium or large series production.

Woodworking is subject to specialization with regard to the product range, whether to produce only boards or only beams, only joists, only sleepers or groups of them, and in terms of size – mostly in thickness and width. Regardless of the degree of specialization, however, production remains a fossilized material. An important feature is that in the cutting, which also depends to a large extent on the wood raw material, also accompanying materials (sub-boards, furniture details, etc.) are produced. Taking into account the specialization of the manufacturing operations and the specialized equipment used, as well as the nature of the produced production, the woodworking production is classified into the group production processes of the production organization. Of course, there may also be an exception if a milling machine is used and the part of the wood that remains after its profiling is sharpened into technological splinters. Then a streamlined form of organization of production can also be configured. It should be emphasized that the impact of consumer demand for pre-fabricated materials in terms of tailoring needs is not a factor influencing production. Of course, here as well as in all other industries, the requirements in terms of size and quality of the fabricated materials remain and over time these requirements will increase.

In furniture manufacturing, unlike production of boards and shaped materials, there is a great variety concerning the series nature of the manufactured production and form of production organization. In the small craft workshops and single type of production in the conditions of custom work, the form of organization is individual. The enterprises with small, medium and large series production, by moving from custom to store way of production, by increasing the specialization of the production operations and of the used equipment and volumes of single-type of manufactured production, move to group form of production organization. For the furniture manufacturing it is difficult to organize a line, which would range all production operations and processes, since the change of the production of some models with other changes also their constructions, and with that also the main (limiting) machines in the lines of working the mass timber and board materials.

General terms

According to NSI, the indicator 'Number of enterprises' refers to all non-financial enterprises, which were active during whole or part of the reference year and have submitted their annual reports in the National Statistical Institute or National Revenue Agency.

The turnover includes the value of all revenue from sales of own products, goods bought and sold in the same condition, services provided and raw materials sold, including accrued excise duties, which are invoiced during the reference period. It does not include the revenue from sales of fixed assets, the income from financing, the financial and the extraordinary revenue. The value of turnover does not include accrued taxes on the type of value added tax (VAT) which are charged to the end user.

Employees are all persons who have a labour contract (fixed or permanent; full-time or part-time) with their employer by virtue of the Labour Code or the Civil Servants Act and who receive remuneration in cash or in kind for certain quality and quantity of work done.

NSI defines the number of persons employed as all persons employed working in a given enterprise on full or part-time, including seasonal workers, home workers, working owners, employees under contract for management and control, employees in civil contracts that do not work with another employer and unpaid family workers. It does not include those absent for an unlimited time, as well as those provided under contract by other companies.