

Innovative Activity of Small and Medium-Sized Enterprises

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Abstract

The importance of small and medium enterprises (SMEs) for the economy of our country is constantly growing. In 2018, they made up 99.8% of the enterprises in the country. They employ 75.7% of all employees in the economy and they provide 65.3% of the country's added value. The innovation activity of SMEs largely determines the overall innovative performance of our country, and therefore the pace of its development. It is increasingly realized that the stimulation of innovation in SMEs is an important mechanism for achieving competitiveness and economic success not only of individual enterprises but also of our country as a whole.

Given this, the first purpose of this study is to perform a comparative analysis of the innovation activity of Bulgarian SMEs compared to the other EU countries and to determine the main areas of achievement and lag. The comparative analysis was performed on the basis of data from official national, European and world sources, as well as from published research results on this issue.

The second purpose is to present the results of an empirical study of the innovation activity

of a sample of Bulgarian SMEs, conducted by the authors. The survey covers 100 micro, small and medium-sized enterprises from different sectors of the processing industry and its purpose is to check, supplement and clarify secondary information studied for the first stage.

Keywords: small and medium-sized enterprises; innovation, activity, research, analysis.

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Introduction

The interest in small and medium-sized enterprises (SMEs) to achieve economic growth is constantly growing (Veugelers R. et al., 2018). They constitute not only a large part of the economies of the states, but are also the basis of the process of their positive change. (Bravo-Biosca, 2017; Szczepańska-Woszczyna K., 2016). A large number of authors emphasize the importance of SMEs. For example, according to Szczepańska-Woszczyna (Szczepańska-Woszczyna K., 2016.), they play a key role in shaping global economies, being not only a source of economic growth but also of innovation in all sectors. They provide jobs for the citizens of the respective countries, make up for the negative economic trends and

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support the restructuring of the industries. Bruque and Moyano also emphasize that SMEs are an essential factor for economic growth (Bruque and Moyano, 2007; Zeng et al., 2010), and Ahmedova (Ahmedova S., 2021) argues that SMEs are the key drivers of economic growth and play a crucial role in determining the development of the country's economic structure.

The importance of small and medium-sized enterprises (SMEs) for the economy of our country is constantly growing. In 2018, the small and medium enterprises in our country were 412 782 (according to *Research and analysis on the state of small and medium business with Bulgaria and prospects for its development*, Sofia May, 2020) and are the most important part of the economic structure of our country - 99.8%. The number of employees in them is 1,647,337 (75.7% of all employees in the economy). Small and medium-sized enterprises provide added value worth EUR 3.791 million (65.3% of the total economy).

The importance of SMEs as a source of economic growth largely depends on their innovation activity. It is widely acknowledged that innovation is the key to success. This has been repeatedly emphasized by research by the OECD and many other authors. Innovation is a key driver of productivity and long-term growth and can help address societal challenges at the lowest possible cost (OECD, 2015). Innovation in SMEs is at the heart of inclusive growth strategies: more innovative SMEs are more productive, can pay better wages and offer better working conditions to their workers, thus helping to reduce inequalities (OECD, 2015a). Supporting innovation in SMEs can promote inclusive growth by reducing productivity and pay gaps between SMEs and large companies (OECD,

2018). Innovation plays a key role in building the competitiveness of SMEs (Szczepańska, 2014; Van de Vrande et al. 2009), in strengthening their market positions and in gaining a greater market share, in increasing the efficiency of operations, in improving of reputation and reducing their costs (Cooke and Mayes, 1996).

However, unlike large enterprises, SMEs are highly vulnerable to the negative impact of the business environment (Sousa et al. 2012; Mitussis, 2010) and only half of them survive more than five years (Klonowski, 2009). Innovation is the main means of surviving in a changing and dynamic competitive environment, as well as of their good business performance (Porter, 1991; Adams, Bessant and Phelps, 2006). In this environment, companies that have an effective innovation approach and generate results have been shown to perform better than other companies (Hoffman et al., 1998; Porter, 2001; Roper et al., 2002; Baldwin and Gellatly, 2003).

At the same time, due to their characteristics, SMEs tend to react quickly and adapt quickly to changes in the economic environment by introducing such innovations and innovative activities that meet customer requirements (Ahmedova S., 2021). They can profit by adjusting to environmental changes faster than larger organization due to their nimbleness, missing hierarchies, and quick decision-making (Nooteboom, 1994; Vossen, 1998). That is why the contribution of SMEs to the innovation activity of the countries is great (Akman and Cengiz, 2008). For example the innovation activity of SMEs largely determines the overall innovative performance of our country, and therefore the pace of its development. It is increasingly realized that the stimulation of innovation in SMEs is an important mechanism for

achieving competitiveness and economic success not only of individual enterprises but also of our country as a whole. The managers of the Bulgarian small and medium enterprises understand this well. A survey (KANTAR, 2020) shows that the relative share of SMEs that value innovation in business is 33% as very important and 47% as important. At the same time, despite this positive attitude towards innovation, Bulgarian SMEs lag behind European ones in their actual introduction. There are many reasons for this, but the main ones are related to the peculiarities of the business environment, including the unsatisfactory level of efficiency of the innovation system.

However, a number of studies find that SMEs are, on average, less innovative than large companies (OCED, 2018). For example, in OCED countries, the average national share of SMEs in business R&D is only 35%. This sector faces considerable challenges regarding its innovation activities because the globalization of markets, economic changes, rapid product life cycles, and technological developments continuously increase competition (Utterback, 1994). Small firms are approximately only half as likely as large firms to have a business website allowing for online ordering and only one-third as likely as large firms to be using Enterprise Resource Planning (ERP), a software platform that integrates core business processes in real-time (OCED, 2018).

As the practical relevance of innovations in SMEs increases, so does the number of scientific research dedicated to them. Numerous empirical studies are being performed. Some of them study the innovation activity of SMEs in certain industries (Ahmedova S., 2021), others study the different types of innovations that companies

carry out. Others examine the variables that are thought to be responsible for innovation performance and diversity in organizations, including key success factors (Rothwell, 1989; Rothwell and Dogson, 1991; Noteboom, 1994; Keizer et al., 2002; Božić L., Radas S., 2005, Rodrigues Alves M. et al. 2016). A fourth group of authors examines the effects of innovation activities and tries to relate them analytically to specific innovations (Hoffman et al., 1998; Keizer et al., 2002; Božić L., Radas S., 2005). A fifth group of authors examines the main barriers to the innovation activity of SMEs, including the determinants and their innovation capacity, and the sixth group of authors explores the possibilities for stimulating this activity in SMEs. Others aim at specifying successful technological and innovation practices (Sánchez A. et al., 2011; Oakey and Cooper, 1991). A number of authors also explore the different approaches to innovation of large and small enterprises, as well as the advantages in this respect of large companies (Rothwell, 1989, British Academy of Management, 2014). Another group of authors conducted research on the increased uncertainty and risks of innovation (Eisenhardt and Martin, 2000). An important area of research is the interaction in the field of innovation between SMEs with universities, research organizations and individual companies and its effects (Bodas F., Verspagen B., 2017; Sousa-Ginel E. et al., 2021). It should be noted that a number of surveys, summaries and rankings of the innovation activity of SMEs and large companies from individual industries, countries and regions were also carried out. A number of other studies based on metadata (Rosenbusch N., Brinckmann J., 2011) as a method for systematic synthesis of the results

from a set of empirical findings were also performed. (Hunter and Schmidt, 2004).

Despite the amount of research, a number of important theoretical, methodological and applied problems related to SME innovation are still unresolved or insufficiently developed. This also applies to the studies of the constantly changing picture of the innovation activity of Bulgarian SMEs and the reasons for the current state of this activity. The aim is to draw conclusions useful to the institutions responsible for stimulating SMEs and in particular for innovation in them, in developing policies and programs in this area, as well as for the leaders of individual companies in making management decisions.

Given the above, this publication performs a comparative analysis of the innovation activity of Bulgarian SMEs compared to the other EU countries and determines the main areas of achievement and lag. The results of an empirical study of the innovation activity of a sample of Bulgarian SMEs are presented.

The paper is organized as follows: Section 1 is an introduction and an overview of relevant literature, Section 2 explains the methodology, Section 3 presents a study of the innovation activity of SMEs on the basis of secondary data and description of the results, Section 4 presents the results of the empirical study of the innovation activity of SMEs, Section 5 is a discussion of the results and Section 6 contains the conclusion.

Methodological basis of the research

The study was carried out in two successive stages:

1. Study and comparative analysis of the innovation activity of Bulgarian SMEs according to data from official national, European and world sources, as well as from published results of research on this issue. The aim is on this basis to characterize their innovation activity, to make comparisons with other EU countries and to identify the main areas of achievement and lag.
2. Empirical study of the innovation activity of a sample of Bulgarian SMEs in order to check, supplement and specify in real conditions the secondary information studied at the first stage.

The survey was conducted in 2019 and covers 100 micro, small and medium enterprises from different sectors of the manufacturing industry. The distribution of the surveyed SMEs by settlements is - 72 located in Sofia, 16 - in large cities and 12 in small settlements. The sample surveyed was selected so that the size distribution of the surveyed enterprises takes into account, as far as possible, the established distribution of SMEs in the country as a whole. Given this, the share of the surveyed micro-enterprises is the largest, and the medium-sized - the smallest. 70 micro-enterprises, 20 small and 10 medium-sized enterprises were studied. This sample is not representative of Bulgarian SMEs, but the results are interesting and indicative of the state of innovation capacity in them. They can be useful for guiding efforts to improve innovation.

The research approach is based on the collection, processing and analysis of empirical information based on a specially prepared research methodology and using statistical methods and specialized software for processing and analysis of information (SPSS). It includes surveys of owners and managers of SMEs, and when this is not possible, managers at a lower level of management. A questionnaire was used for this purpose.

The study determined the levels of innovation capacity of the surveyed enterprises and its determinants. They are determined by summarizing the assessments of the surveyed SME managers and using the methodology set out in (Veleva S., Tsvetanova A., 2020). The levels of development of the determinants of innovation capacity in enterprises are assessed on a scale from 1 to 7, as 1 - the lowest level of development, 7 - the highest level of development (Veleve, M., Atanasova, S., 2013). The value of the weighted assessment of each individual determinant is in the range from 1 to 49, and the value of the calculated indicator for the innovation capacity of enterprises is in the range from 13 to 637. The higher it is, the higher the innovation capacity of enterprises.

The main hypotheses of the study are:

H1. The level of innovation capacity of the surveyed SMEs is not high and it is lower in smaller enterprises;

H2. The innovation activity of the surveyed SMEs is low;

H3: The low level of innovation capacity of SMEs is a factor for their insufficient innovation activity;

H4: The innovation activity of the surveyed SMEs is lower in enterprises with smaller size.

Study of innovation activity of SMEs on the basis of secondary data

SMEs are an important part of the economy of our country and given this, their innovation activity should be considered in the context of the overall innovation performance of the country. Unfortunately, Bulgaria still lags significantly behind other EU countries. According to the ranking of the World Economic Forum in The Global Competitiveness Report for 2019, Bulgaria ranks 48th in innovation capacity from 141

countries, but with a very low score - 45 of the top 100 (WEF, The Global Competitiveness Report - Global Competitiveness Index, 2019). According to the European Innovation Scoreboard 2020, Bulgaria is ranked at the lowest level compared to other EU countries in terms of efficiency of its innovation system.

The European Innovation Scoreboard (EIS) annually determines the Innovation Index for the EU member states, according to which it evaluates the innovation of the countries and compares them with the average level for the EU as a whole. The evaluations are performed on four main types of activities, covering ten innovative dimensions and a total of 27 different indicators. Depending on the level of innovation determined by the index, the countries are grouped into four groups - innovation leaders, strong innovators, moderate innovators and modest innovators. The first group of innovation leaders in 2019 includes 5 Member States that have innovation above 125% of the EU average. These countries are Denmark, Finland, Luxembourg, the Netherlands and Sweden. The second group of strong innovators included 7 countries that have an index score between 95% and 125% of the EU average - Austria, Belgium, Estonia, France, Germany, Ireland and Portugal. The third group of moderate innovators includes 13 countries with innovation between 50% and 95% of the EU level. Such innovators are Croatia, Cyprus, the Czech Republic, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia and Spain. Bulgaria, together with Romania, are placed in the fourth group of so-called "modest innovators", which show a level of innovation below 50% of the EU average (Figure 1).

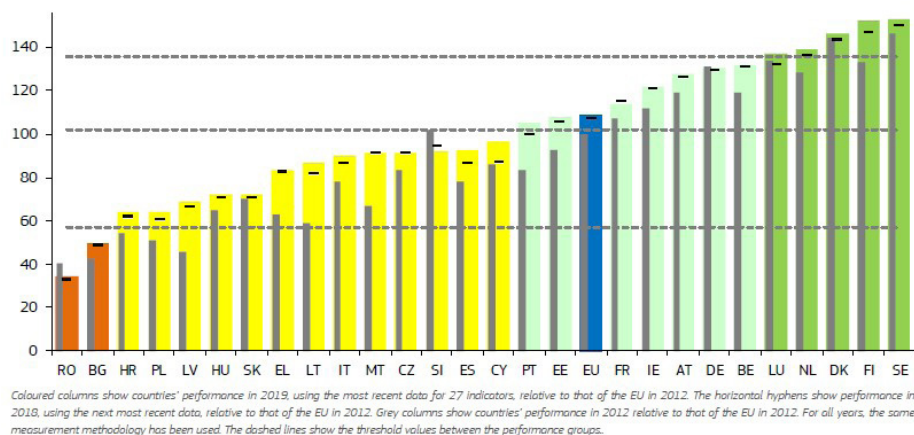


Figure 1. EU Innovation Ranking.

Source: The European Innovation Scoreboard 2020.

The light columns in the figure show the innovation levels of the countries in 2019, relative to the EU average in 2012. The horizontal dashes show the levels in 2018, and the dark columns show the results of the countries in 2012 compared to the EU level for 2012. The dashed lines show the threshold values of the four groups of innovators.

The efficiency of the EU innovation system, measured as a weighted average of

the performance evaluations of the innovation systems of all 27 Member States, improved by 8,9 percentage points between 2012 and 2019, but for modest innovators the score improved slightly (by 0,6 percentage points), which widens the gap with moderate innovators. For Bulgaria the increase is by 6.9% points, and for Romania a decrease of 5.7% points has been found (Figure 2.).

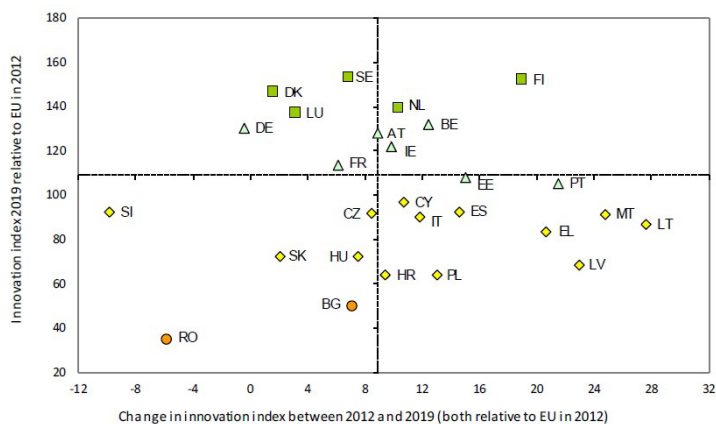


Figure 2. Changing the levels of innovation of EU countries.

Source: The European Innovation Scoreboard 2020.

In 2012, Bulgaria had an innovation score of 42.3% of the EU average for the same year. In 2019, its estimate is 49.5% of

the EU estimate for 2012 and 45.4% of the EU estimate for 2019. This, albeit slight, improvement is shown in Figure 3.

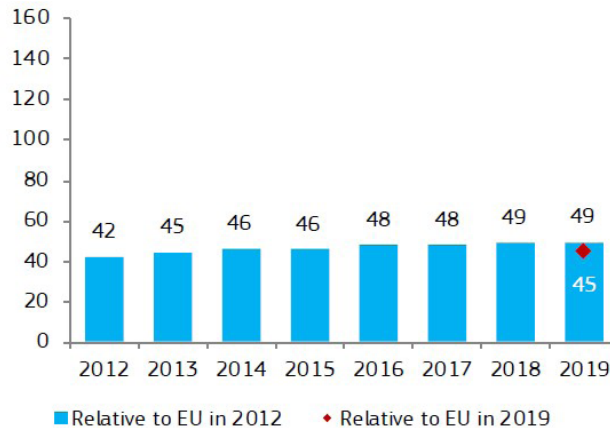


Figure 3. Changing the level of innovation in Bulgaria compared to the EU average.

Source: The European Innovation Scoreboard 2020.

The data from The European Innovation Scoreboard (EIS) allow us to monitor the levels of our country by individual types of activities, innovation dimensions and indicators, as well as to make comparisons with other countries and with the average level for the EU as a whole. On this basis, the main weaknesses of the Bulgarian innovation system and the challenges to its future development become apparent.

For example, in terms of human resources qualification, Bulgaria performs better than Hungary, which is a moderate innovator, but occupies one of the last places in the EU. Overall, modest innovators perform below the EU average. Romania has the worst performance. The EU average increased by 15.2% between 2012 and 2019, and the level of Bulgaria is 44.9% compared to 2012 and 52.2% of the EU average for 2019 (Figure 4).

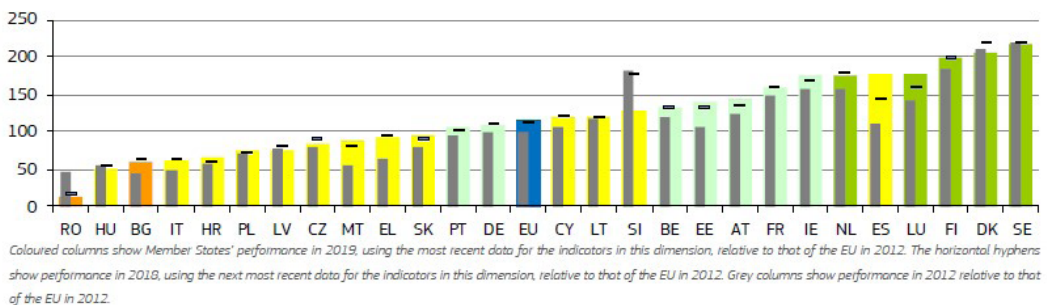


Figure 4. Change in the qualification levels of human resources of the EU and the Member States between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

In terms of the attractiveness of their research systems, the modest innovators occupy the last two positions in the ranking for the EU, with Bulgaria in last place. The EU average increased by 14.2% between 2012

and 2019, and between 2018 and 2019 by 2.2%. Bulgaria's level is only 25.2% compared to 2012 and 25.8% of the EU average for 2019 (Figure 5.)

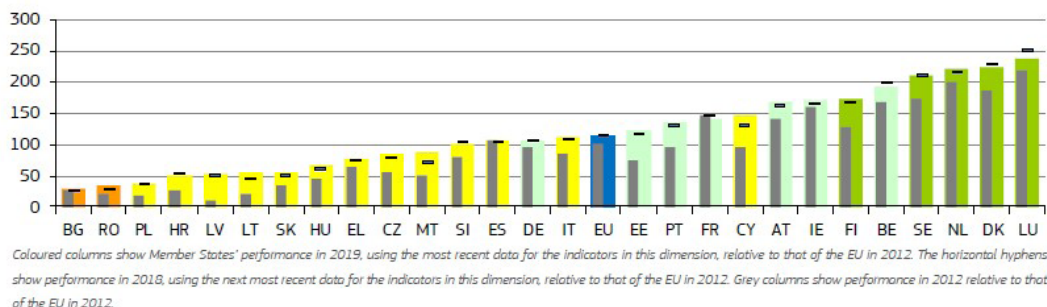


Figure 5. Changing the attractiveness of EU and Member State research systems between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

According to the indicator favorable for innovation environment, Bulgaria is in the penultimate place in the ranking of EU countries. The other modest innovator, Romania, performs significantly better and even outperforms three moderate innovators.

The EU average increased by 73.9% between 2012 and 2019, and between 2018 and 2019 by 20.4%. The level of Bulgaria is 39.7% compared to 2012 and 42.9% of the EU average for 2019 (Figure 6).

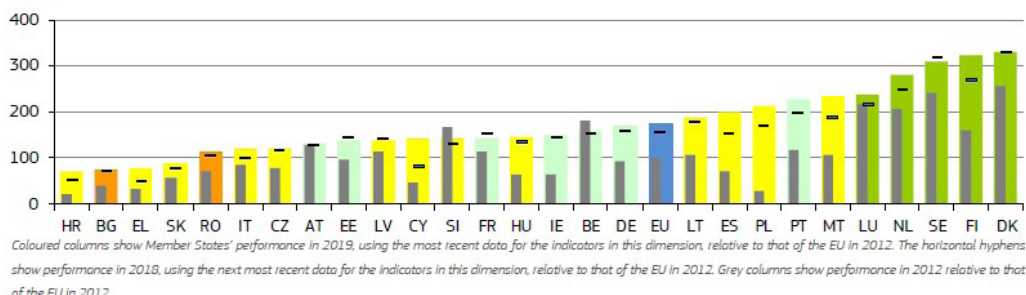


Figure 6. Changing the innovation-friendly environment of the EU and Member States between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

Finance and support for innovation are of great importance for its development, but modest innovators, in general, are again below the EU average (Figure 7). This is due to our country, because Romania performs better than five moderate innovators. The EU

average increased by 15.5% between 2012 and 2019, and between 2018 and 2019 by 3.5%. The level of Bulgaria is 62.8% compared to 2012 and only 11.6% of the EU average for 2019.

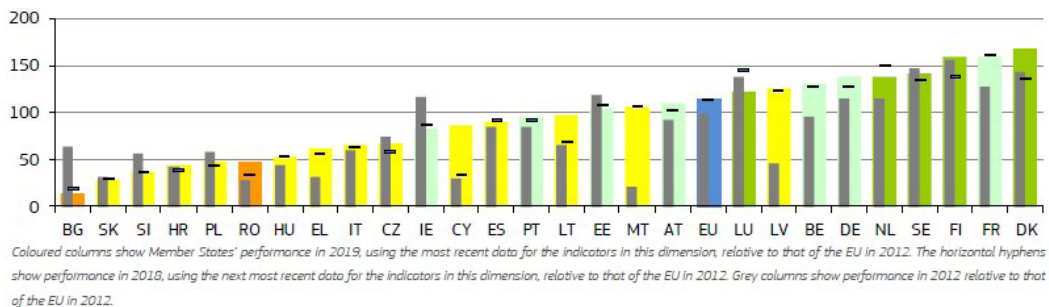


Figure 7. Change in finance and support for innovation in the EU and Member States between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

In terms of corporate investment in innovation, the EU's position in the ranking is relatively high, but modest innovators are again performing poorly. The EU average

increased by 3.3% between 2018 and 2019. Bulgaria's level is 43.9% compared to 2012 and only 40.7% of the EU average for 2019 (Figure 8.)

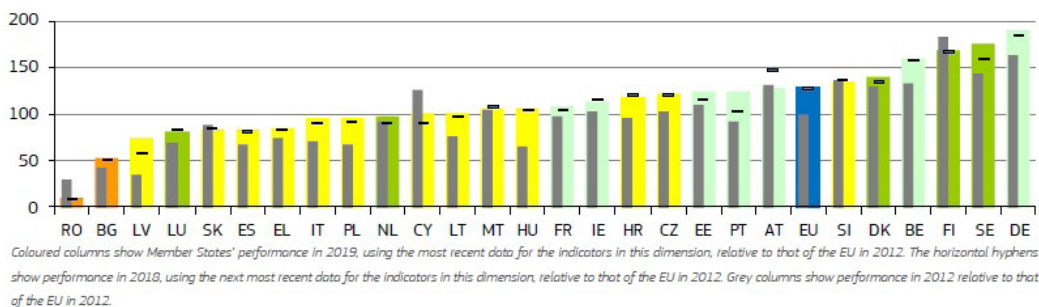


Figure 8. Change in corporate investment for innovation in the EU and Member States between 2012 and 2019.

Source: The European Innovation Scoreboard 2020.

The EU average for the innovator indicator decreased by 10.6% between 2012 and 2019, and compared to 2018 the performance remained the same for the EU and all 27

Member States. Bulgaria's level is only 21.0% compared to 2012 and 26.8% of the EU average for 2019 (Figure 9.)

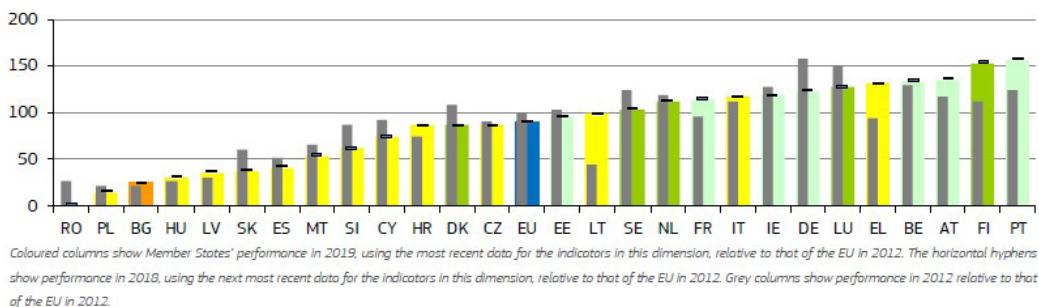


Figure 9. Change in estimates for EU and Member State innovators between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

Articles

According to the connectivity indicator, the EU average increased by 3.0% between 2012 and 2019, and between 2018 and 2019

by 0.2%. Bulgaria's level is 35.3% compared to 2012 and 34.6% of the EU average for 2019 (Figure 10.)

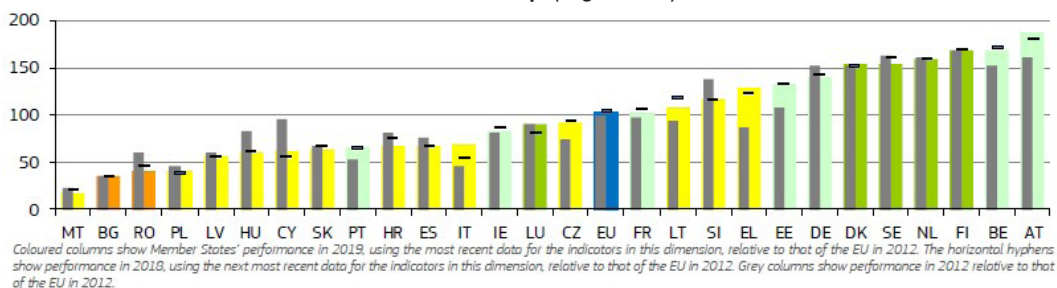


Figure 10. Change in EU-Member State connectivity assessments between 2012 and 2019.

Source: The European Innovation Scoreboard 2020.

According to the indicator of intellectual assets, Bulgaria, although a modest innovator, is presented at a level close to the EU average. Its level is 60.5% compared to 2012

and 83.4% of the EU average for 2019. The EU average decreased by 6.6% between 2012 and 2019 and by 3.4% between 2018 and 2019. (Figure 11).

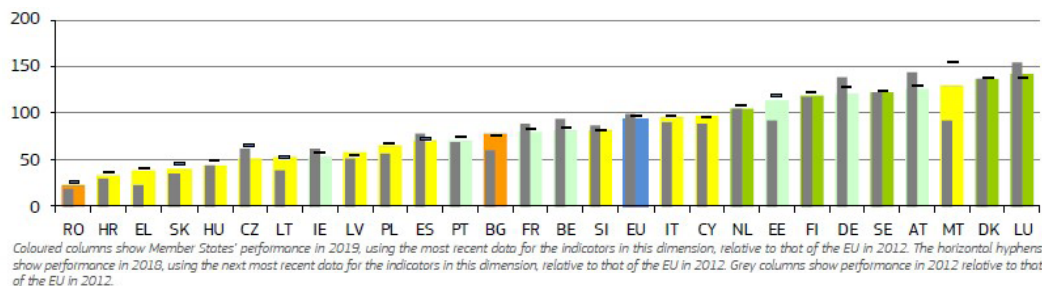


Figure 11. Change in the estimates for the EU and Member States intellectual assets indicator between 2012 and 2019.

Source: The European Innovation Scoreboard 2020.

Compared to other measures, the EU's position in the employment impact ranking is relatively high. The EU average increased by 7.9% and 5.8% between 2018 and 2019 and by

5.8% between 2012 and 2019. Bulgaria shows a strong performance above the EU average - respectively by 91.9 % compared to 2012 and 111.3% of the EU average for 2019 (Figure 12).

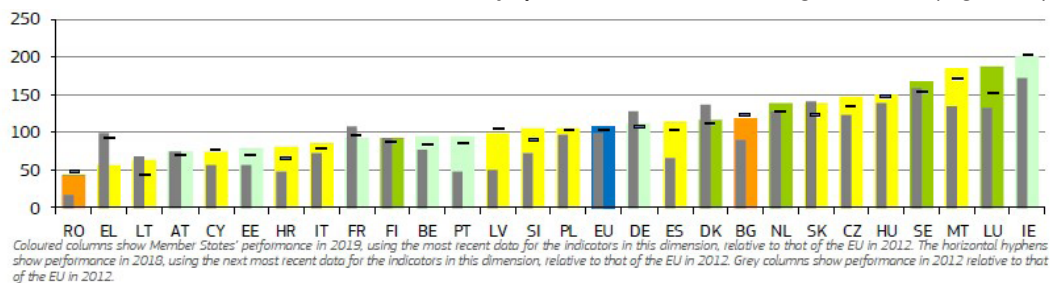


Figure 12. Change in the employment impact indicator of the EU and Member States between 2012 and 2019

Source: The European Innovation Scoreboard 2020.

According to the sales impact indicator, modest innovators are below the EU average, but Romania ranks relatively high, leaving five moderate innovators and one strong innovator behind. The EU average increased

by 0.3% between 2018 and 2019. Bulgaria's performance is low - by 27.5% compared to 2012 and 40.5% of the EU average for 2019, respectively (Figure 13).

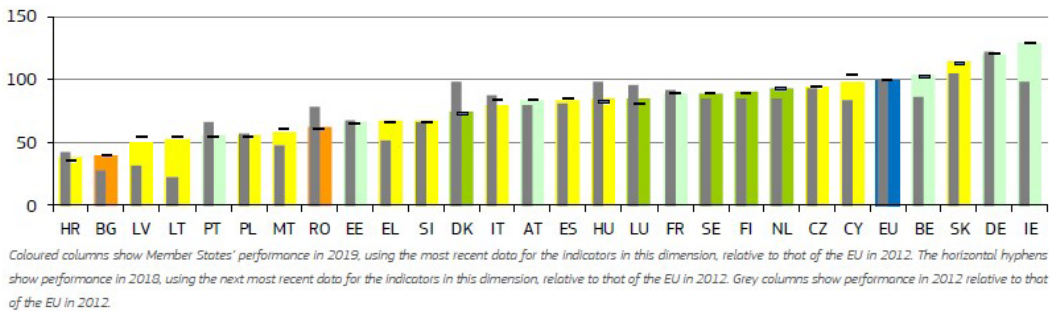
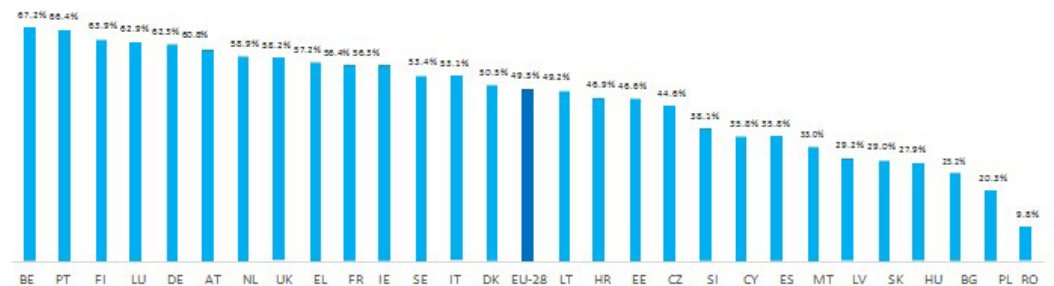


Figure 13. Change in the EU and Member States sales impact indicator between 2012 and 2019.
Source: The European Innovation Scoreboard 2020.

The unsatisfactory performance of our country in terms of innovation and almost all of its building dimensions and indicators is typical of SMEs, as an important part of the country's economy.

In general, the innovation activity of small and medium-sized enterprises in the European Union is close to the average for OECD countries. In the EU, the share of innovative SMEs in the period 2014-2016 was

almost 50%, and the average for all non-EU countries is 45%. At the same time, this share varies considerably from one Member State to another. In 13 countries, just over half of all SMEs have undertaken some form of innovation, and in 7 (including Bulgaria) - a third or less of SMEs (EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019) (Figure 14).



Note: The SME population in the CIS includes only small and medium-sized enterprises. An innovating SME is a SME which in 2014-2016 had either introduced an innovation or had any kind of innovation activity (including enterprises with abandoned/suspended or on-going innovation activities).

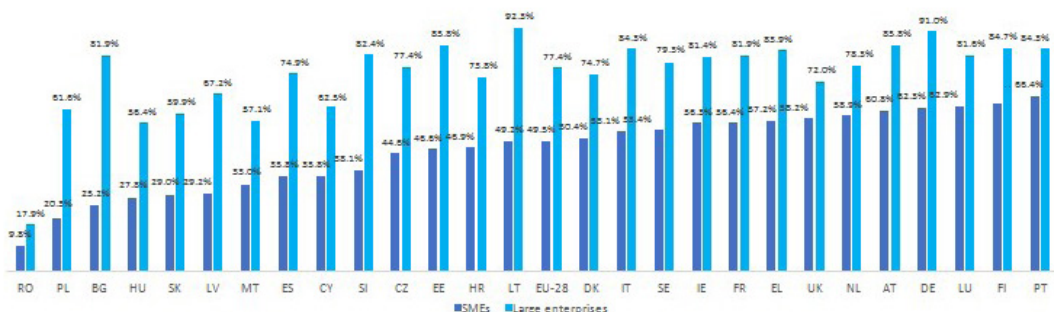
Figure 14. Share of SMEs in the EU countries with innovation activity in the period 2014 - 2016
Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

Large enterprises are more innovative than small ones, and this is typical of every

Member State. The difference between the share of innovative SMEs and large

enterprises in the EU is 28 percentage points and is higher than the OECD average of only 18 percentage points. The difference in the share of innovative large enterprises and SMEs largely reflects the greater sensitivity of SMEs to the overall innovation environment.

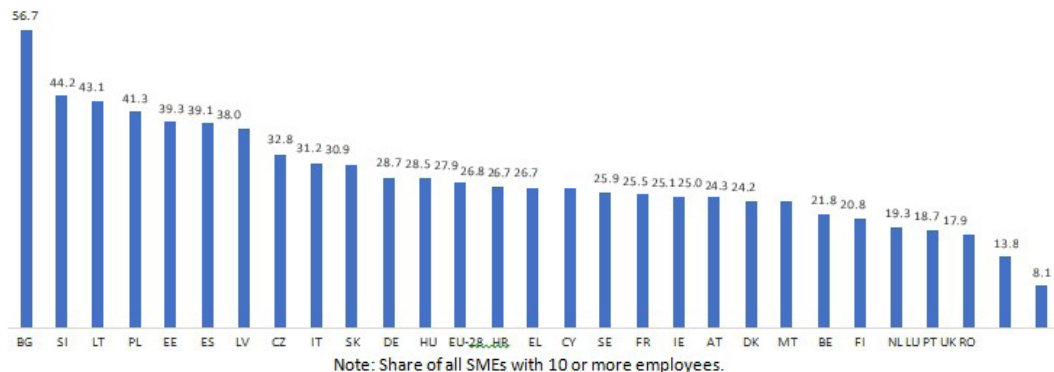
In the period 2014-2016, at EU level, 77.4% of large companies reported some innovation activity, while only 49.5% of SMEs undertook innovation activity (Figure 15). This difference is especially large in Bulgaria, as well as in most Central European countries (Figure 16).



Note: The share of innovating SMEs and large enterprises is expressed as a percentage of the number of enterprises in the relevant enterprise size class. Share of SMEs with 10 or more employees.

Figure 15. Share of SMEs and large enterprises with innovation activity in the period 2014 - 2016 in the EU countries.

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.



Note: Share of all SMEs with 10 or more employees.

Figure 16. Difference between the share of SMEs and large enterprises with innovation in the period 2014 - 2016 in the EU countries in percentage points.

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

Almost half of the innovative EU SMEs have introduced either product, or process, or organizational or marketing innovations, and a significant part of them have combined several types of innovations (complex innovations) at the same time. For example, slightly more than

a quarter of them have undertaken product and / or process innovation and slightly less than a quarter - organizational and / or marketing innovations. More than half of the innovative SMEs have undertaken complex innovations (Figure 17).

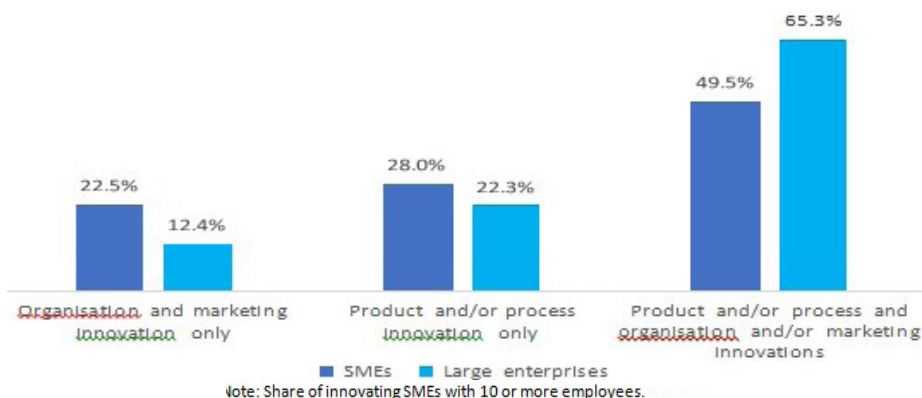


Figure 17. Share of SMEs in the EU that carried out some kind of innovation in the period 2014 - 2016.

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

EU SMEs that report at least one product or process innovation are 38.3%, compared to 67.8% for large enterprises. These shares for enterprises that have introduced at least one organizational / marketing innovation are 35.6% for SMEs and 60.1% for large enterprises.

Differences in the innovation activity of SMEs for the implementation of different types of innovations are also observed between the manufacturing sector and the services sector. In general, the share of innovative SMEs in the manufacturing sector exceeds by very little their share in the services sector - shares of 50% and 49.5%, respectively. The

services sector is ahead of the production in organizational and / or marketing innovations, and the production sector is far ahead in terms of product and / or process innovations. This is clearly seen in Figure 18. EU Member States are almost equally divided on whether the share of innovative SMEs in the manufacturing sector is higher or lower than in the services sector (Figure 19). The share of innovative SMEs in the services sector is higher mainly in the so-called new Member States of Central and Eastern Europe. For Bulgaria this share is higher by 31%.

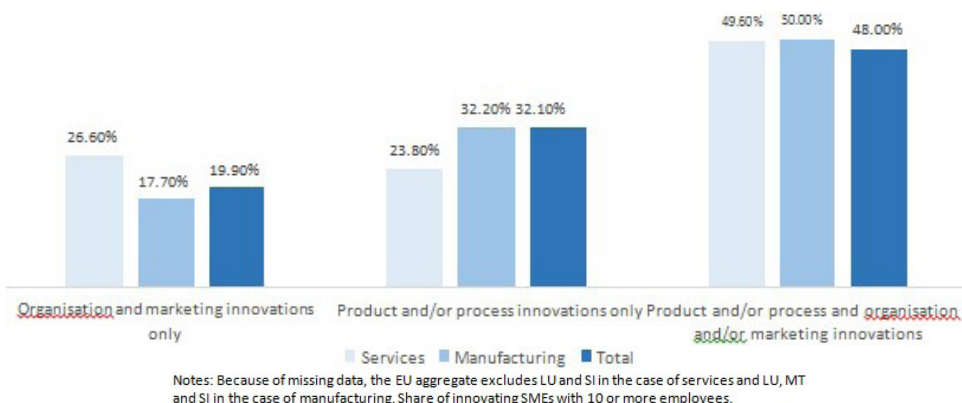
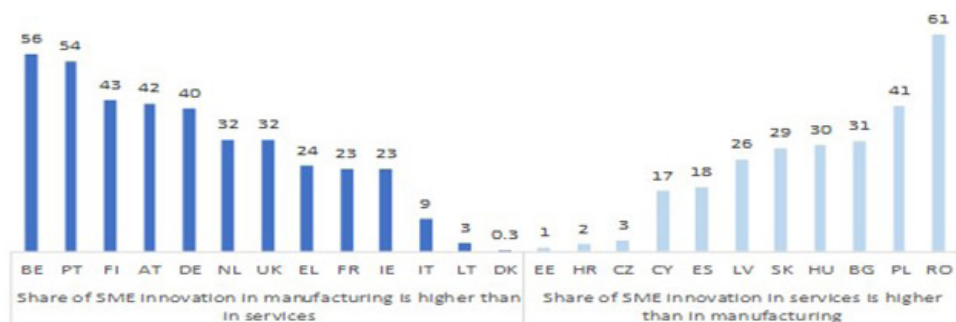


Figure 18. Share of SMEs in the EU by sectors that carried out some kind of innovation in the period 2014 - 2016.

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.



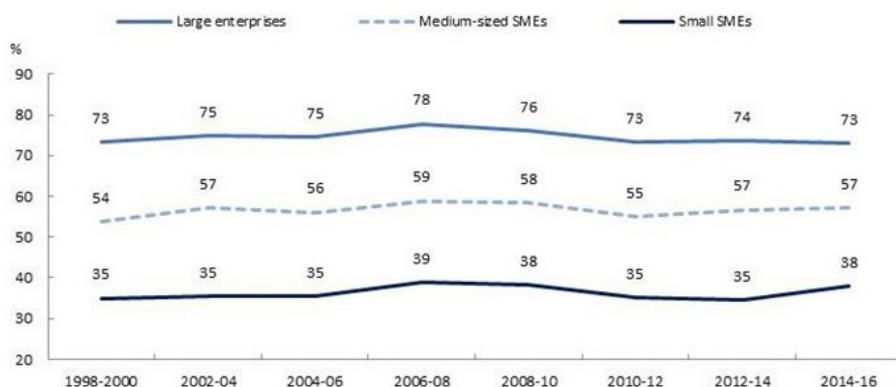
Notes: Because of missing data, LU, MT and SI are not shown in the figure. Share of innovating SMEs with 10 or more employees.

Figure 19. Distribution of EU member states according to the excess of the shares of innovative SMEs in the production and services sectors, 2014 - 2016

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

The dynamics of the shares of enterprises of different sizes from the EU manufacturing sector, which made some kind of innovation, in the period 1998 to 2016 is shown in Figure 20. It can be seen that during this period

there is no significant change in large and medium enterprises, despite the presence of some fluctuations over the years. There was an increase in small enterprises in 2016 compared to 1998.



Note: As a percentage of total enterprise population in each size class. In each reference period, only Member States with non-missing values for all enterprise size classes are included. Countries with missing data in more than one reference period are excluded from the EU aggregate. Data refer to 3-year reference periods corresponding to each CIS survey round. No data are available for 2000-2002.

Figure 20. Shares of enterprises of different sizes in the EU manufacturing sector that made some kind of innovation in the period 1998 to 2016

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

The share of SMEs that have implemented product innovation by introducing a new or significantly improved product between 2014 and 2016 varies considerably in the EU Member States, from 27% in Belgium to 1.2% in Romania. The shares of large enterprises that have made product innovations are

significantly higher in all Member States. The share of large enterprises in Bulgaria, product innovators, is 26%, and for SMEs this share is only 8%. At EU level, 32% of large enterprises had such innovation activity, compared to 13% of SMEs. (Figure 21).

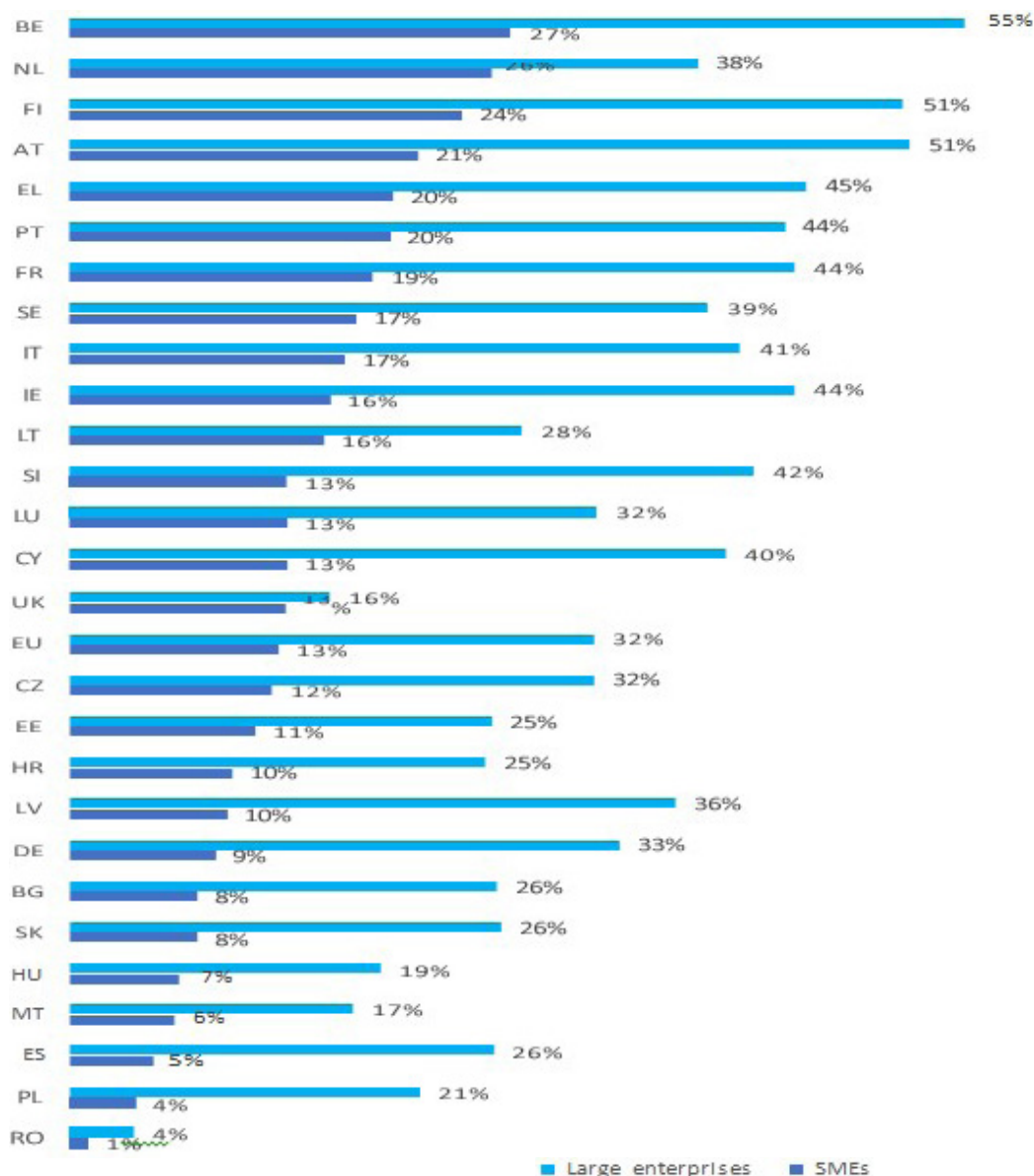


Figure 21. Shares of SMEs and large enterprises from EU member states that have implemented product innovations in the period 1998 to 2016

Source: EUROPEAN COMMISSION, ANNUAL REPORT ON EUROPEAN SMEs 2018/2019.

From the presented data it is clear that Bulgarian SMEs lag far behind in terms of innovation from the EU average and from almost all other member states. This is evidenced by the latest data from the SBA

Fact Sheet 2019, according to which the share of Bulgarian SMEs that have brought product or process innovation is 16.3%, while the average share for the EU is 33.3%. The share of SMEs in our country that have introduced

organizational and marketing innovations is 15.7%, and the average in the EU is 33.4% (SBA Fact Sheet 2019).

SMEs in Bulgaria that have innovated on their own have a share of 13.8%, while in the EU this share is 28.9%. The share of these SMEs that have innovated in cooperation with others is 3.7%, and in the EU it is 12.2%. Sales of new products to the market accounted for only 6%, compared to the EU average of 13.4%.

Similar conclusions can be drawn from the data of the EIB Investment Survey for 2019. They clarify that only 22% of Bulgarian SMEs had some innovation activity during the year, and only 10% were active innovators - those who had both research and innovation (EIB Investment Survey, 2019). At the same time, only 29% of the enterprises indicated that they have modern equipment. There is a large share of companies that spend insufficient on research, intangible assets and digitalisation, much less than the EU average.

According to data from The 2019-2029 PwC SMEs survey cited in (European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of a new strategy, 2020.)

in 2019 40.3 % of SMEs in our country implemented process innovations in order to reduce production costs and increase productivity. The planned such innovations for 2020 were 43.3%. The share of micro-enterprises that have implemented process innovations is 35.4%, of small enterprises 42.9%, and of medium-sized enterprises it is 64.2%. This innovative activity is obviously insufficient, given the poor condition of the technical base of a large part of Bulgarian SMEs, although 55.6% of SMEs have invested in it in the last five years. According to their self-assessment, only 34.5% of SMEs use equipment and technologies, modern by Bulgarian standards and 23.1% - modern by European standards. The enterprises that estimate that they use obsolete by Bulgarian standards machines and equipment are 12%, and obsolete by European standards 28.2%. This problem is particularly noticeable in smaller businesses. For example, about 10% of micro-enterprises evaluate their equipment as obsolete by Bulgarian standards and 22% as obsolete by European standards. For medium-sized enterprises, these indicators are 5% and 17.3%, respectively (Figures 22 and 23).

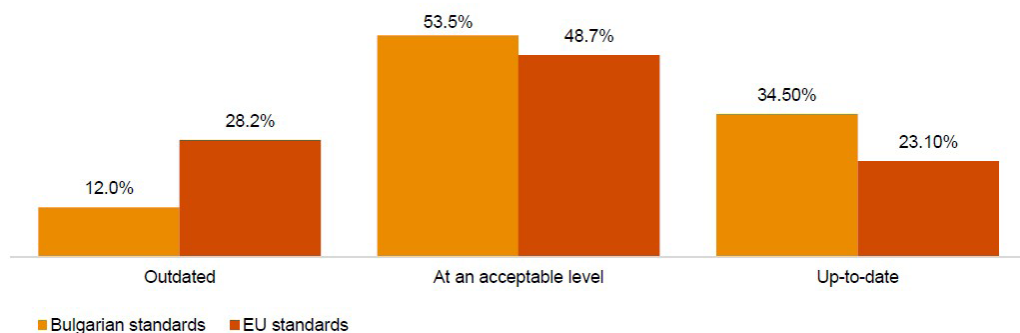


Figure 22. Level of technology in Bulgarian SMEs.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

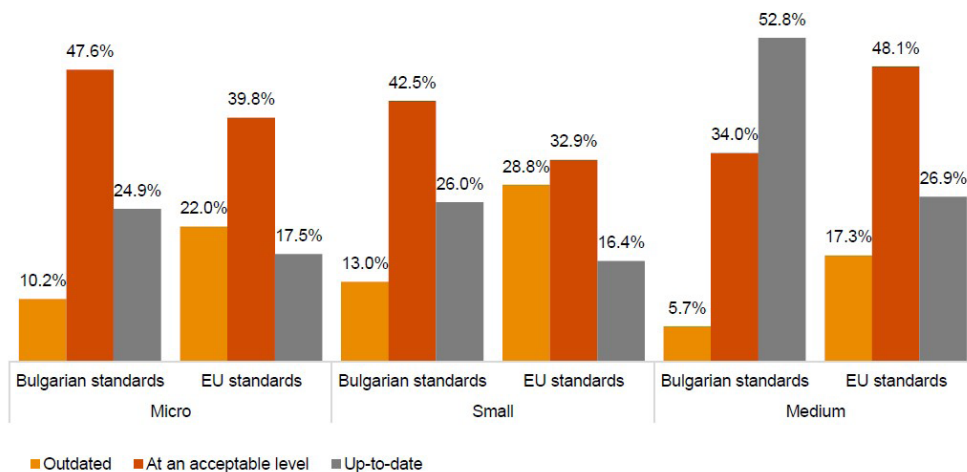


Figure 23. Level of technology in Bulgarian SMEs, according to their size.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

26.9% of SMEs have made product innovations in the last five years and introduced new or improved products to the market, and 22.9% plan to do so in 2020. Again, the medium-sized enterprises are

more innovative, with which the percentage of implemented product innovations is 49.1%. For micro-enterprises this indicator is only 19.7%, and for small - 34.7%. These data are demonstrated in the following figure.

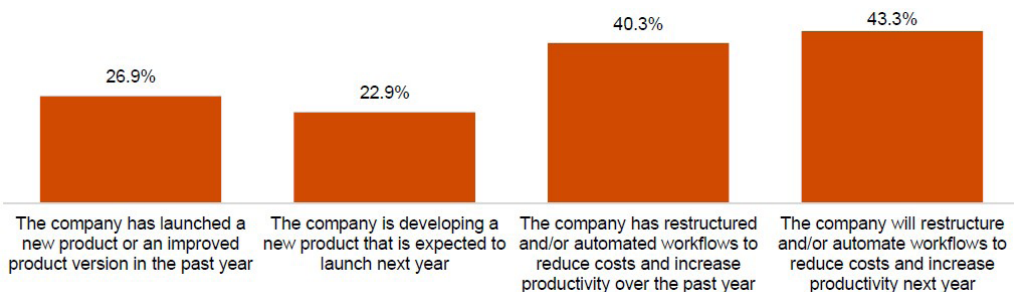


Figure 24. Share of SMEs that have implemented product and process innovations.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

Of course, there is a certain, albeit timid, positive trend towards improving the performance of Bulgarian SMEs in the field of innovation, as evidenced by data from recent years. To assess and monitor the dynamics of innovation activity and to create intellectual property, the authors of the Technical Report including in-depth analysis of the SMEs in

Bulgaria and preliminary recommendations for the directions of action of a new strategy (European Commission, 2020) used two index - Innovations Index and Trademarks and Patents Index. These indices evaluate enterprises with low and high activity in the specific field.

It was found that SMEs with very low innovation activity decreased in 2020

compared to 2011 from 79.8% to 45.6%, and the share of enterprises with higher activity is increasing, although not enough. a very high index of their innovation activity increased from 0.8% in 2011 to 3.9% in 2020 (Figure 25).

A positive trend for growth of their innovation index is observed for all sizes of

SMEs. Again, the positive trends are more noticeable in larger companies. For example, the value of the innovation index for 2020 is more than twice as high for medium-sized enterprises as for micro-enterprises. The data are shown in Figure 26.

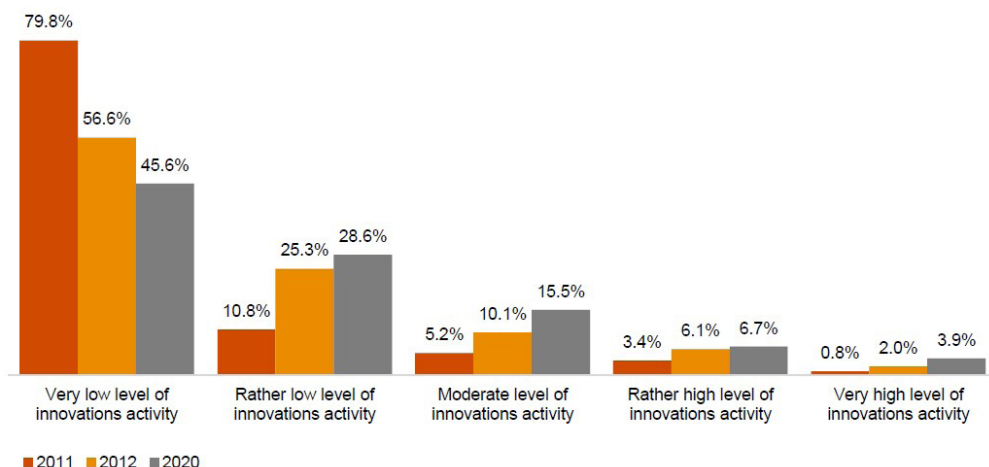


Figure 25. Percentage distribution of SMEs, depending on the value of their innovation index.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

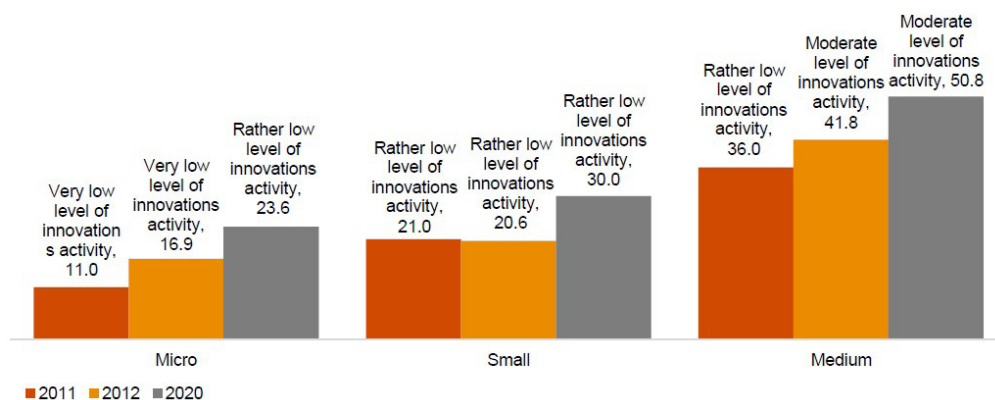


Figure 26. Change of the innovation index of SMEs, depending on their size.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

The analysis by regions shows a weak, positive dynamics of the average value of the innovation index in the period 2011-

2020, moreover, for all regions. SMEs from all regions have moved from the group of companies with very low innovation activity

to the group of companies with rather low innovation activity. Again, the southwestern region of the country is best represented,

followed by the south-central. The average estimates by region for the period 2011 - 2020 are shown in Figure 27.

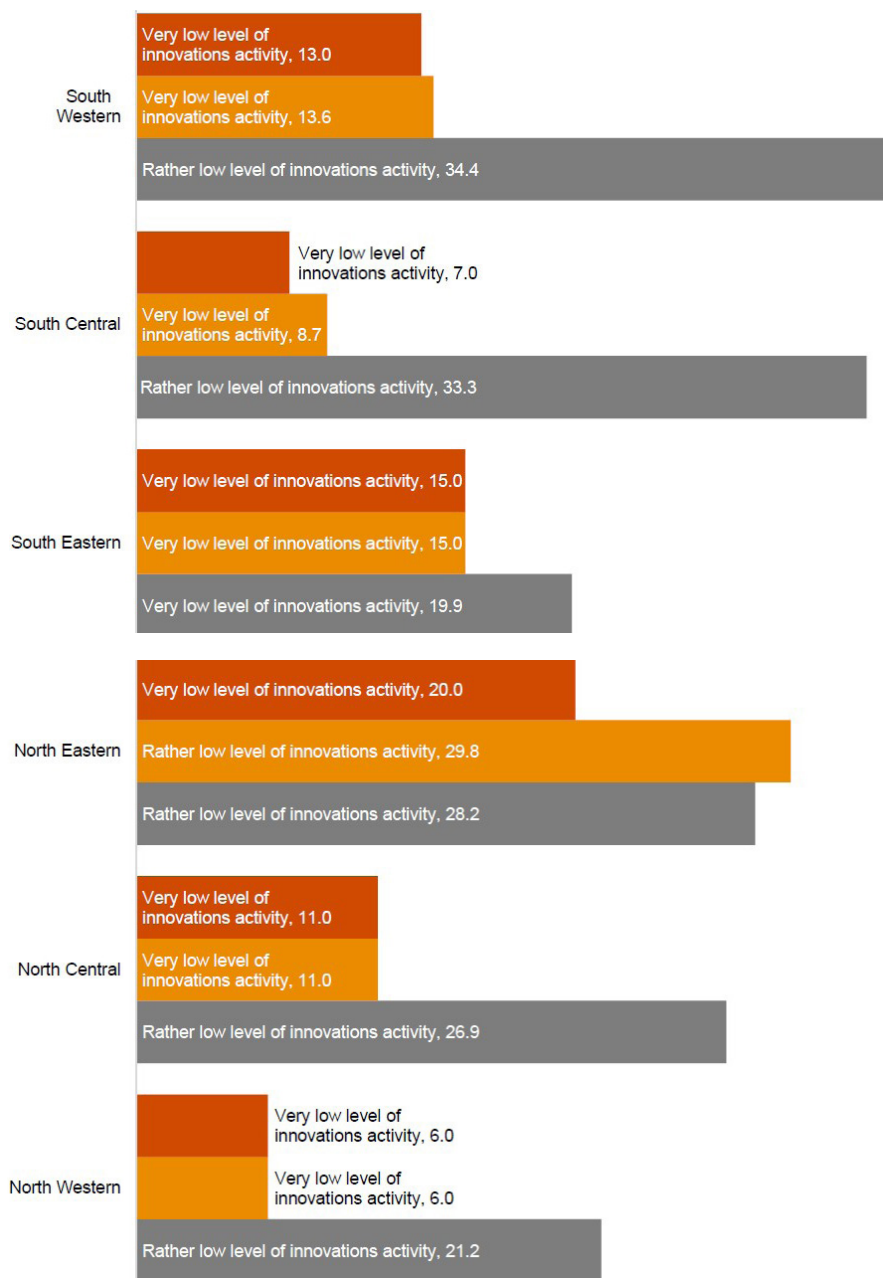


Figure 27. Change of the innovation index of SMEs, depending on their size, by regions.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

The use of patents in Bulgaria is at a very low level. In 2018, this indicator for our country was only 11.8 per 1 million GDP, while the EU average was 90.9. This is one of the lowest levels for member states. However, within the analyzed period (2011 - 2020) there is an improvement, although very small, in the creation of intellectual property by SMEs. According to the values of the Trademarks

and Patents Index, the share of enterprises with a very low level of this activity fell from 93.9% in 2011 to 74.0% in 2020. At the same time, the shares of enterprises with higher activity increased. in the creation of intellectual property. For example, the share of very high-level enterprises in this activity increased from 0.2% in 2011 to 1.4% in 2020. These results are shown in Figure 28.

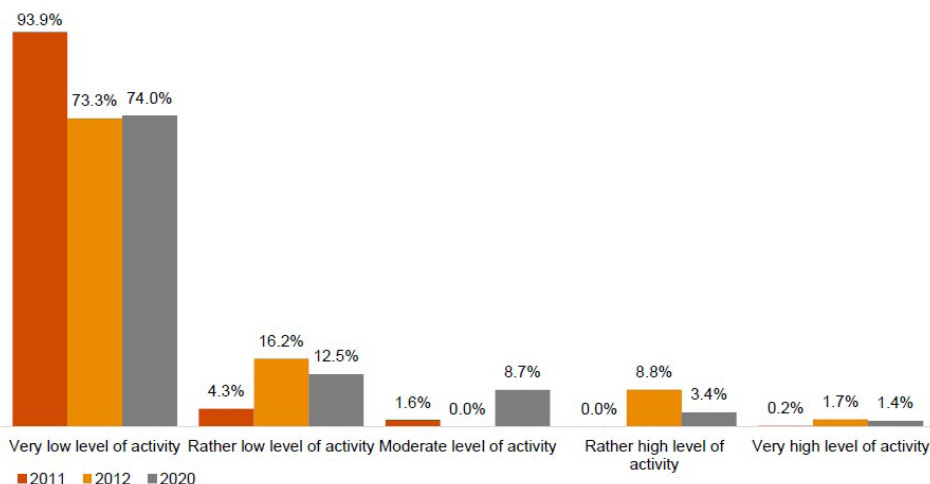


Figure 28. Percentage distribution of SMEs, depending on the value of The Trademarks and Patents Index.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

The positive trend of increasing activity related to the creation of intellectual property is observed in all sizes of SMEs. The biggest progress is again for larger companies. For

example, the value of The Trademarks and Patents Index for 2020 is about five times higher for medium-sized enterprises than for micro-enterprises (Figure 29).

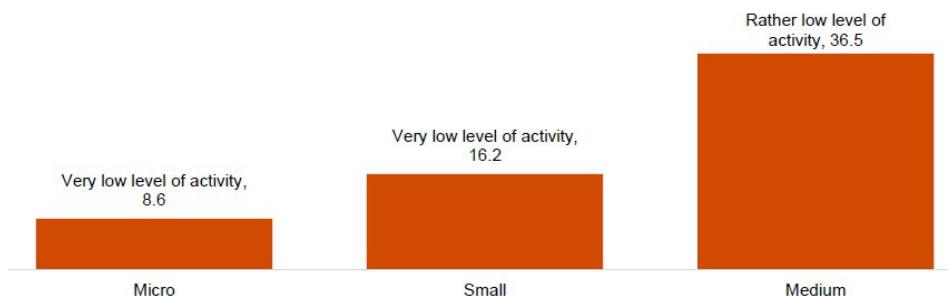


Figure 29. Change of The Trademarks and Patents Index of SMEs, depending on their size.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

Weak positive dynamics of the average value of the index for the creation of intellectual property in the period 2011-2020 is observed in all regions of the country. The

southwestern region of the country is best represented, followed by the south-central one. The average estimates by region for the period 2011 - 2020 are shown in Figure 30.

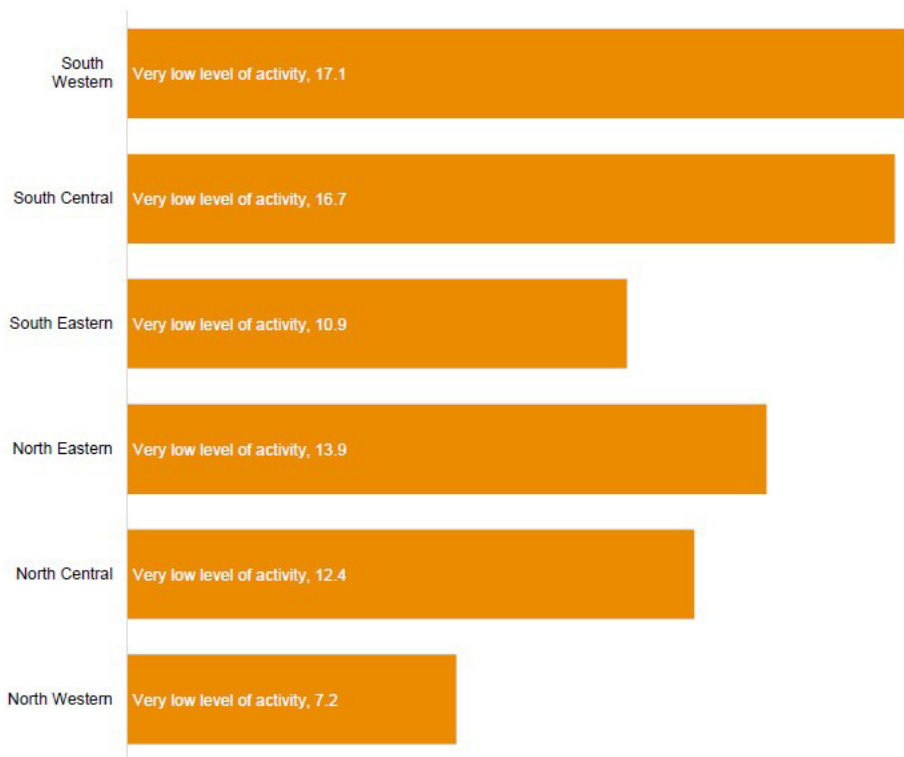


Figure 30. The Trademarks and Patents Index of SMEs by region.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

Interesting and up-to-date data on the innovation activity of SMEs in our country are presented in the report on the results of a survey conducted in March 2020 among 500 SMEs (KANTAR - National Representative Survey among Small and Medium Enterprises, 2020). According to them, about 32% of companies have carried out activities aimed at better digitalization of their business, and another 17% have upgraded their ICT systems and implemented new technologies and solutions for information and data. The results also show that:

- 44.2% of SMEs have innovated their products and services;
- 18.4% have introduced new business process management systems;
- 12.0% have implemented systems / production automation;
- 31.9% used new digital channels for sales, and / or for marketing and communication;
- 17.1% have upgraded their ICT systems / implemented new technologies and solutions for information and data;

- 7.8% have implemented new logistics processes, including automation;
- 34.4% have established new business partnerships;
- 11.7% have started activity / business on markets outside Bulgaria;
- 14.0% carried out research and development activities, including in partnership;
- 29.4% provided training and qualification of employees.

It was found that automated systems are present in about half of the enterprises, and about 72% do not intend to implement others in the next 1-2 years. The main automated systems currently used are: Customer Relationship Management - implemented by 30.7% of companies and planned for future implementation by 17.7%; Integrated internal process management system - currently 24% of companies have such systems, and another 15% plan to use them; Supplier relationship management - used by 18% of enterprises and planned for implementation by another 10% of SMEs. The priorities for innovation in the coming periods are the creation of new business partnerships, including with representatives of other sectors of 41% of SMEs; raising the qualification of employees - 36% SMEs and using new digital channels for marketing / sales and communication - 31% SMEs.

According to the Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020 (European Commission, 2020), the main problems facing the innovation activity of SMEs in Bulgaria are: lack of innovation infrastructure in small enterprises and its insufficient development in the others; insufficient professional skills and competence among managers and associates; insufficient

human resources employed in research and development, high age of those already employed and shortage of young researchers; lack of financial resources for innovation, especially for smaller enterprises.

Unfortunately, the funds allocated in our country for research and innovation are too small and insufficient for the accelerated development of innovation. According to Eurostat, these funds were 0.49% of GDP in the period 2009 - 2018, while the EU average was 2.1%. The funds for this purpose that the business has invested in 2018 are only BGN 594.8 million, of which 60.6% are invested by SMEs. In the same year the total number of people employed in research and development in business organizations was 13 thousand people, as 71.1% were from SMEs. Moreover, only 12.3% of SMEs had a research and development unit.

The main components of the innovation infrastructure of enterprises that would stimulate their innovation are:

- Organizing and maintaining professional libraries;
- Availability of the necessary technologies and their level;
- Existence of a research and development unit, as well as research staff;
- Formation of human capital with the necessary specialized professional skills;
- Close cooperation with academic institutions and researchers;
- Availability of the necessary funding for innovation.

A study conducted for the purposes of this report has yielded interesting results on the state of the components of the innovation infrastructure of SMEs as a percentage of enterprises. They are shown in Figure 31.

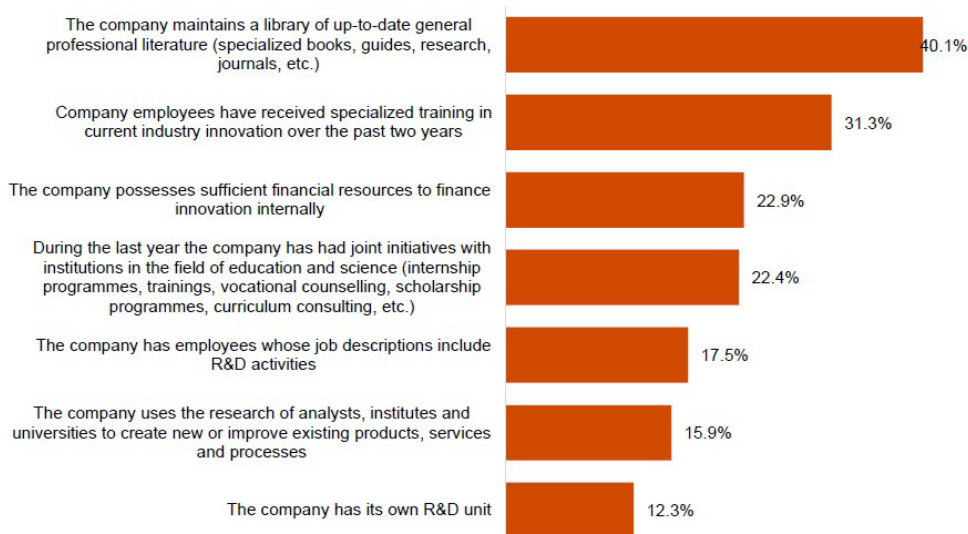


Figure 31. Development of the components of the innovation infrastructure in the Bulgarian SMEs.

Source: European Commission, Technical Report including in-depth analysis of the SMEs in Bulgaria and preliminary recommendations for the directions of action of the new strategy, 2020.

Results of the empirical study of the innovation activity of SMEs

Initially, as a result of the study, the levels of innovation capacity of the surveyed enterprises and its determinants were determined. The results show that the determinants of the innovation capacity of SMEs are too low at the level of development. The average innovation capacity of SMEs in the entire sample is also low. It is at a level more than three times lower than the maximum possible. This inevitably

had a great impact on the innovation activity of these enterprises.

It was found that the levels of determinants and innovation capacity of SMEs differ significantly depending on their size (Figure 32). For example, the average score for the innovation capacity of micro-enterprises is only 176, which is well below the average for the rating scale. For medium-sized enterprises, this estimate is slightly higher, although it is below the required level - 240.75.

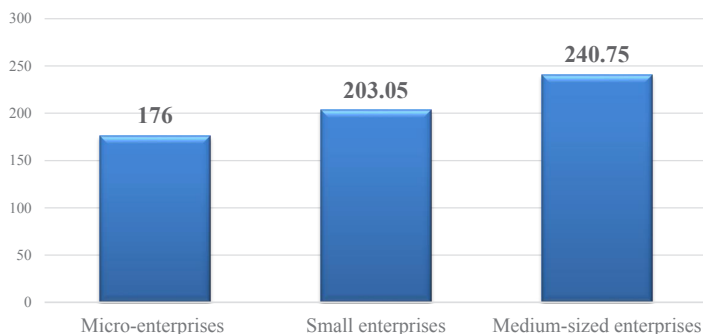


Figure 32. Average level of innovation capacity of the studied population of SMEs of different sizes.

This proves the first research hypothesis that the level of innovation capacity of the surveyed SMEs is not high and is lower in the smaller enterprises.

The study examined the total number of innovations that SMEs have implemented during the analyzed period. It was found that for the whole period 48 SMEs (48%) made

innovations, which shows moderate innovation activity (Figure 33). Some SMEs have carried out one or more innovations over the years of the period. These results partially prove the second research hypothesis – that the innovation activity of the surveyed SMEs is low.

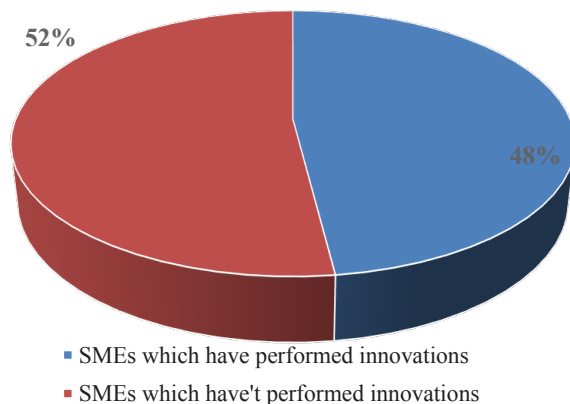


Figure 33. Relative share of innovation performing SMEs

The distribution of SMEs that have innovated according to their size is: number of micro-enterprises that have innovated - 26 (37.14%), number of small enterprises - 14

(70%), number of medium-sized enterprises that have innovated - 8 (80%) - Figure 34. This shows that the innovation activity of SMEs decreases with their reduction.

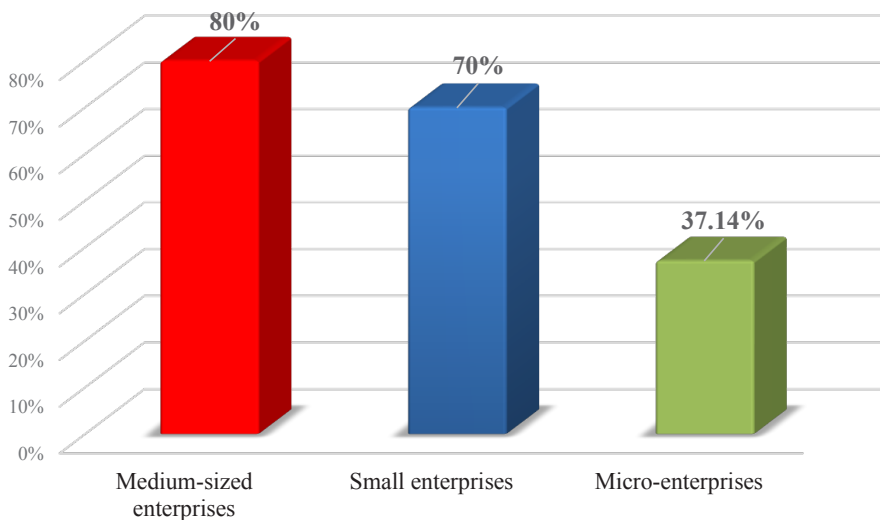


Figure 34. Relative shares of SMEs that innovated during the period by size

It can be assumed that it is the lower level of innovation capacity of smaller enterprises that has had an impact on their insufficient innovation activity. This proves the third research hypothesis that the low level of innovation capacity of SMEs is a factor for their insufficient innovation activity.

During the year, a number of SMEs carried out several types of innovations

simultaneously, but most of the innovations are in process. They were mainly related to the introduction of new equipment and technologies in order to reduce production costs and increase productivity. Such innovations have been implemented by 40% of the surveyed enterprises. Product innovations were implemented by 38% of enterprises, organizational - 33%, marketing - 20%.

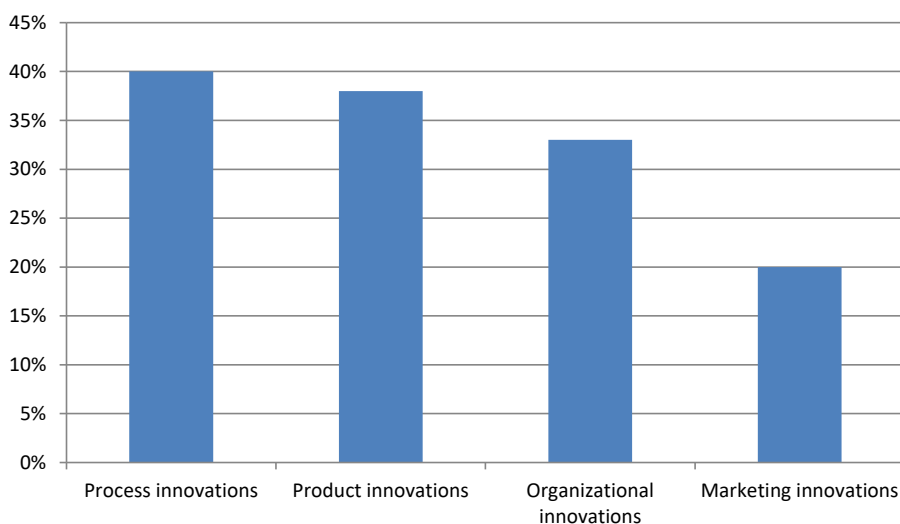


Figure 35. Shares of the implemented innovations by SMEs by types.

In all types of innovations, the highest activity during the year had the larger enterprises, which also have a higher level of their innovation capacity. For example, 35.71% of micro-enterprises have implemented process innovations, 28.57% - product, 30.0%

- organizational and only 11.43% marketing, while these percentages in medium-sized enterprises are respectively 60, 70, 50, and 60%. The distribution of SMEs by type of innovation is shown in Table 1.

Table 1. Number and share of SMEs that have implemented the respective types of innovations

Kind of innovation	Micro-enterprises		Small enterprises		Medium-sized enterprises	
	Number of enterprises	%	Number of enterprises	%	Number of enterprises	%
Process innovations	25	33,71 %	9	45,0 %	6	60,0 %
Product innovations	20	28,57 %	11	55,0 %	7	70 %
Organizational innovations	21	30,0 %	7	35,0 %	5	50,0 %
Marketing innovations	8	11,43 %	6	30,0 %	6	60,0 %

The obtained results give grounds to confirm the fourth research hypothesis, namely that the innovation activity of the surveyed SMEs is lower in enterprises with a smaller size.

Discussion of the results

The first purpose of this study was to perform a comparative analysis of the innovation activity of Bulgarian SMEs compared to the other EU countries and to determine the main areas of achievement and lag. The comparative analysis was performed on the basis of data from official national, European and world sources, as well as from published research results on this issue.

The obtained results showed that the innovation activity of Bulgarian SMEs is not high and they lag behind this indicator compared to other European Union countries, as well as compared to the average level for the union. They lag behind in almost all indicators that characterize this activity.

The second purpose of this article was to present the results of an empirical study of the innovation activity of a sample of Bulgarian SMEs, conducted by the authors. The survey covers 100 micro, small and medium-sized enterprises from different sectors of the processing industry and its purpose is to check, supplement and clarify secondary information studied for the first stage.

The empirical study confirmed the conclusions already made and found that the innovation activity of SMEs in the sample was moderate during the period, being low in micro-enterprises, but increasing with the increase in the size of enterprises. The levels of the determinants of innovation capacity and of the innovation capacity of SMEs themselves are too low and this is the main reason for their insufficient innovation activity.

These levels vary considerably depending on the size of the SME. They are lowest in micro-enterprises and higher in medium-sized enterprises.

Important obstacles to innovation activity of SMEs are the insufficient development of their innovation infrastructure, the insufficient professional skills and competence among managers and staff, the lack or the small number of staff engaged in innovation, the lack of financial resources and others. To overcome these obstacles, it is necessary to conduct an effective state policy to stimulate the development of SMEs and innovation in them. It should include measures for the development of the national innovation ecosystem, human capital, stimulating cooperation with the main participants in the innovation system (enterprises, business service providers, universities, government organizations, financiers), project financing of innovation, financial incentives for the introduction of modern information and communication technologies, etc.

Conclusion

Small and medium enterprises are of growing importance for the Bulgarian economy. Their innovation activity significantly determines the overall innovative performance of our country, and therefore the pace of its development. In view of this, the publication makes a critical assessment of the innovation activity of Bulgarian SMEs and on the basis of a comparative analysis compared to other European Union countries, the main areas of lag are identified.

The obtained results showed that the innovation activity of Bulgarian SMEs is not high and they lag behind this indicator compared to other EU countries, as well as compared to the average level for the union.

These results can be a basis for further discussion on the issues raised and can be useful for properly targeting the efforts of government agencies and managers to stimulate the development of SMEs and their innovation. These results can be useful for future research and applied research concerning corporate innovation, as well as for business leaders to properly guide the innovation efforts of companies.

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