VILNIUS TECH
Vilnius Gediminas Technical University

13th International Scientific Conference

BUSINESS AND MANAGEMENT 2023

May 11–12, 2023, Vilnius, Lithuania

ISSN 2029-4441 / eISSN 2029-929X
ISBN 978-609-476-333-5 / eISBN 978-609-476-334-2
Article Number: bm.2023.965
https://doi.org/10.3846/bm.2023.965

BUSINESS TECHNOLOGIES AND SUSTAINABLE ENTREPRENEURSHIP *http://vilniustech.lt/bm*

MODEL FOR ASSESSING THE CURRENT STATE OF INNOVATION DEVELOPMENT OF THE INDUSTRIAL SECTOR IN BULGARIA

Georgi BOYANOV, Milena FILIPOVA*

Department of Management and Marketing, Faculty of Economics,
South-West University "Neofit Rilski"- Blagoevgrad, 66, Ivan Mihailov str., Blagoevgrad, Bulgaria

Received 13-02-2023; accepted 29-03-2023

Abstract. The purpose of this study is to propose a model for assessing the current state of innovation development of industrial enterprises in Bulgaria by evaluating the status of key indicators. The main task to achieve the so defined objective is to define indicators that serve to build the assessment model. The methods used to achieve the goal and accomplish the tasks are factor analysis, methods of comparison, analysis and synthesis. As a result, a model was developed to assess the level of innovation development of industrial enterprises, which can serve for future assessments, comparisons and revealing opportunities for enhancing innovation development.

Keywords: industrial enterprise, innovation development, knowledge, digital skills, innovation policies.

JEL Classification: L00, O10, O32.

Introduction

Bulgaria's industrial sector and its sustainable development are of particular importance for the country's economic growth. In order to develop in a positive direction, industrial enterprises need to pursue an innovation policy that allows them to adapt to European innovation policies. Our country's membership of the European Union implies compliance with common European policies, investment in research and development, cooperation in innovation projects for a successful transition to a green economy based on digital skills, knowledge and smart growth.

The object of research in this article is the current state of innovative development of the industrial sector in Bulgaria. The subject of research in the article is the model for evaluating this current state of innovation development. The main goal of the present study is to propose a model for evaluating the current state of innovation development of industrial enterprises in Bulgaria.

In order to achieve the goal thus set, the following research tasks should be performed:

1. Carrying out a literature review of innovation policy and innovation development.
2. Analysis of models for evaluating innovation development, the results of which form the country's innovation policy and contribute to the formulation of strengths and weaknesses at the national and global level.
3. Identification of the strengths and weaknesses of Bulgaria's innovation development and determination of evaluation indicators that will serve to build an evaluation model.
4. Formulation of a model for evaluation through indicators measuring the level of innovation development at the national and European level and their application to innovative enterprises from key sectors.
5. Provision of recommendations and ideas for improving the innovative development of the industrial sector in Bulgaria based on the proposed model.

The research methodology on the given topic includes systematic methods for collecting, analyzing and interpreting data related to innovations in the Bulgarian industrial sector. Methods such as factor analysis, methods of comparison, analysis and synthesis were used.

In the scientific literature, the concept of innovation policy is considered by researchers at several levels: state, regional and enterprise level. For the effective implementation of the innovation strategies of enterprises, it is of particular importance that the state innovation

* Corresponding author. E-mail: *mfilipova@swu.bg*

policy has an encouraging effect and supports industrial enterprises.

According to R. Waterman (Waterman, 2008, p. 368) government innovation policy is the foundation of enterprise innovation policy. This is because the state innovation policy is the basis for conducting innovation policy at the regional and corporate level, defines the objectives of the innovation strategy, the mechanisms for supporting priority innovation programs and projects.

C. Shevchenko (Shevchenko, 2010, pp. 7–9) Innovation policy of the enterprise is a set of goals, tasks, principles and measures in the field of innovative development of the enterprise, which ensure the effective interaction of all subjects of innovative activity, the adaptation of the enterprise to changes in the external environment; the achievement of strategic development directions; increasing the competitiveness of the enterprise; the realization of interests at all levels (enterprise, employee, region, state).

According to L. Ogoleva (Ogoleva, 2004, p. 238) innovation policy is a determining factor for the innovative activity of the enterprise and contributes to the discovery of innovation potential.

V. Kyurova has a particular view on the innovation policy of the enterprise. Starting from the marketing activity of the enterprise, she considers the creation of new products or new markets for the enterprise as part of its innovation policy (Kyurova, 2013, p. 20). Morozov, Yu. (Morozov, 2005, pp. 20–34) argues that innovation policy is a system of innovative activities aimed at achieving the strategic goals of the enterprise.

According to Waterman (Waterman, 2008, p. 368) enterprise innovation policy is interconnected with corporate marketing and financial strategies, which underpin their construction.

In this regard, C. Kyurova and D. Yaneva emphasize the need for enterprises in Bulgaria to perceive innovation activity as one of their strategic priorities (Kyurova & Yaneva, 2017, p. 497). Analyzing the definitions of innovation policy, we can find that the direction of its implementation is in the strategic plan of the company. The strategic directions of development to be established, the innovative activities aimed at achieving strategic goals, the corporate marketing and financial strategies, all these highlights in the above definitions allow us to conclude that the innovation policy of enterprises should work in favor of the optimal future development of the company's innovation potential and the achievement of strategic goals in an effective way.

In developing the strategic objectives in the innovation policy, Bulgaria strictly complies with the European directives for innovation activities and follows the guidelines of the European innovation policy. The main objective of the Ministry of Innovation and Growth is to develop the tradition of education and science as well as the development of modern technologies. It is the institution which supervises, organises and coordinates the implementation of state policy in the field of innovation, as well as the technological and economic development of the Republic of Bulgaria (Ministry of Innovation and Growth).

The key strategic documents that serve as instruments for achieving our country's innovation goals are:

- National Development Programme BULGARIA 2030 (Ministry of Finance of Republic Bulgaria, 2020a);
- Smart Specialisation Innovation Strategy 2021–2027 (Ministry of Innovation and Growth, 2022);
- National Innovation Fund (Ministry of Economy of Republic Bulgaria, n.d.);
- Financing of enterprises under the National Recovery and Sustainability Plan (Council of Ministers of the Republic of Bulgaria, 2022);
- Enterprise Finance under the Enterprise Competitiveness and Innovation Programme 2021–2027 (European Regional Development Fund);
- Legislative framework (Ministry of Innovation and Growth).

In this paper, the focus is on the industrial enterprise and its innovative development. In the next section we will look in more detail at the theoretical formulation of innovation development in order to obtain a basis for building a model for assessing the current state of innovation development of industrial enterprises in Bulgaria.

1. Theoretical basis of innovation development

The problem of innovative development and its role for the world economy as a factor of economic growth is the subject of the works of N. Kondratieff (Kondratieff, 1984), G. Mensch (Mensch, 1979), J. Schumpeter (Schumpeter, 2017), S. Kuznets (Kuznets, 2016).

The orientation towards scientific and technical progress and innovation activity is an important prerequisite for improving firm competitiveness and profitability (Yaneva, 2021, p. 182).

As the main objective of the innovative development of the enterprise can be pointed out the increase of its competitive advantages through several activities, which includes the preservation of economic benefits through targeted modification of internal factors such as technological solutions, new management methods, as well as changes in the structure of production of the new product or service (Morozov, 2010, pp. 181–183).

The methodological foundations of the innovative development of the enterprise reveal the main economic categories, signs, subjects, objects, organizational structures, processes, factors, conditions and results (Lapaev, 2016, p. 40).

The innovative development of the enterprise is interlinked with innovation, innovation activities and innovation processes (Plotnikov, 2014, p. 48). Innovation is an essential element of global success in an economics. In this rapidly changing world and bringing predicaments

and also favorable opportunities for business, innovation can benefit from these changes and significantly support business (Yuleva-Chuchulaina, 2019, pp. 111–123).

In this regard, V. Kyurova and Bl. Koyundzhiyska-Davidkova (Kyurova & Koyundzhiyska-Davidkova, 2020, p. 200) make the important conclusion that it is innovation that helps not only to build competitive advantage and increase competitiveness, but also to advance scientific and technical progress.

According to V. Zhuravlev (Zhuravlev, 2010, p. 49) the main factors that ensure the effective growth of the innovation-creative economy and its development are human capital, domestic demand, investment, innovation, modernization, and creative activity of all market entities. It is necessary to take into account that creativity contributes to the stimulation of innovative behavior and a fuller use of the innovative potential of managers and employees in the enterprise (Kyurova, 2020, p. 363).

In our opinion, the development of creativity and the investment in the human resources of the enterprise as a source of creativity are of particular importance for innovation development.

The key force for achieving the goals set for the enterprise is the qualities of the people and their contribution to the realization of these goals (Dimitrova, 2022, p. 19). The successful production process of an innovative enterprise requires not only organisational structures, techniques, technologies and new concepts. A major factor for the success of the enterprise is the recruitment of suitable employees and their effective management (Dimitrova & Sotirova, 2020, p. 162).

The application of adequate management methods to enhance the innovative development of enterprises should be a continuous and mutual process between the government and business, as it is important that innovation is stimulated and encouraged by government measures and policies.

The changes brought about by innovation in the enterprise are mainly large-scale. Processes are being renewed, work is change and the demands on the workforce change in equal measure (Yuleva-Chuchulaina, 2021a, pp. 54–60).

Making good management decisions based on systems-oriented approaches provides a clear view of the systemic nature and hierarchy of the individual elements. Through proper analysis and synthesis, any innovation activity can go beyond the effect of sectoral solutions. It can be postulated that any innovation considered as a result of a managerial impact changes not only the subsystem in which it is implemented, but all its subsystems, as well as those systems of which the subsystem is a part (Kalaidzhieva, 2016, pp. 99–108).

Innovation management can be defined as the formation and implementation of strategies to reach innovation development targets, as well as modifications to introduce and use new types of equipment and processes in the enterprise's operations (Zharov, 2011, pp. 5–10). Yuleva-Chuchulaina mentions that innovation is the embedding of concepts or creativity that improve products, processes and procedures by increasing the relevance, usefulness and efficiency of products or services (Yuleva-Chuchulaina, 2021b, pp. 314–320).

According to some authors (Hall et al., 2010, pp. 1033–1082) technological innovation helps to improve the productivity of enterprises.

R. Chobanova. According to her (Chobanova, 2003, p. 11) the existing interrelation implies the formulation of the participants in the innovation process in five main sectors: research, education, non-commercial, business and government. The innovation process, according to Chobanova (Chobanova, 2003, p. 24) can be characterized using four sets of indicators: human resources; new knowledge creation; new knowledge transmission and application; innovation finance, innovation performance and markets.

It is important to note that to the innovation performance indicator, the impact of modern innovation is mainly associated with the use of modern information and communication technologies. The authors Lu (Lu, 2017) and Witkowski (Witkowski, 2017) also focus on the relationship between innovation development and the development of the Internet, as well as the existence of big data.

As the need for modern and adequate innovation policies is at the core of the innovative development of the industrial sector companies due to their resource intensity compared to the service companies, the next section of this paper will focus on the policies and strategies for innovative development in Bulgaria.

2. Innovative development of the industry in Bulgaria – policy and development strategy

Bulgarian Ministry of Finance publishes the National Development Programme BULGARIA 2030 (Ministry of Finance of Republic Bulgaria, 2020a), which is a strategic framework document of the highest order in the hierarchy of national programming documents, determining the vision and overall objectives of development policies in all sectors.

This document presents our country's policy on Smart Industry. The Smart Industry policy will aim to stimulate the digitization process of the real economy. The prerequisites for modernization and automation of Bulgarian enterprises will be created. The envisaged interventions will contribute to the implementation of specific aspects of Goal 8 "Stimulate sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" and Goal 9 "Build sustainable infrastructure, promote inclusive and sustainable industrialisation and stimulate innovation" of the UN Sustainable Development Goals (Ministry of Finance of Republic Bulgaria, 2020a, p. 14).

Overall, smart industry policy encompasses objectives that create opportunities for the development of the Industry 4.0 concept. These include:

– strengthening the link between science and industry;
– creation of a fund to finance Bulgarian projects in the field of Industry 4.0 and artificial intelligence;
– technological renewal by introducing standards, building infrastructure, developing specific mechanisms to stimulate the development and market introduction of technological innovations (new products, services and production processes); building human, scientific, organizational and institutional capacity for the development of Industry 4.0;
– application of financial instruments (Ministry of Finance of Republic Bulgaria, 2020b, pp. 14–15).

In the field of Green and Sustainable Bulgaria (Ministry of Finance of Republic Bulgaria, 2020b, p. 17).

Three national priorities are set:
– circular and low-carbon economy;
– clean air and biodiversity;
– sustainable agriculture.

Bulgaria is the most resource-intensive in the community and for this reason government policies are aimed at transforming our linear economy into a circular one.

In the agricultural sector, the focus on improving competitiveness will be strengthened, including through a focus on research, technology and digitisation, as well as value chain development (Ministry of Finance of Republic Bulgaria, 2020b, p. 23).

In the next section of this paper, we will analyse two main sources of statistical data at international and European level, namely the European Innovation Scoreboard (European Commision, 2022a) and the Global Innovation Index (Global Innovation Index Database, WIPO, 2022).

The Global Innovation Index (GII) project was launched by Sumitra Dutta in 2007 at the University of Oxford. WIPO's association with the GII began co-publishing in 2012. From 2021, the GII is published by WIPO in partnership with the Portulans Institute (Global Innovation Index Database, WIPO, 2022).

The European Innovation Scoreboard provides benchmarking data on innovation in the countries of the European Union. Based on the results of the analysis of the strengths and weaknesses of their national innovation systems, countries are subdivided into: innovation leaders, strong innovators, moderate innovators and emerging innovators (European Commision, 2022a).

3. Current state of innovation development of industrial enterprises in Bulgaria

An important topic of the last months in the political and economic life of our country, as well as an important topic for the citizens, is the non-admission of our country and Romania in Schengen, along with the admission of Croatia. Are our indicators in the area of innovation similar to those of our neighbor Romania and is Croatia significantly more developed than us? We are talking about countries belonging to the group of emerging innovators according to the European Innovation Scoreboard (European Commision, 2022a). In the first table (Table 1) we will look in detail at the performance data for Bulgaria compared to the European Union for 2022.

Table 1. European Innovation Scoreboard 2022, Bulgaria (source: European Commision, 2022b)

Bulgaria	Performance relative to the European Union in 2022	Productivity change 2015–2022	Productivity change 2021–2022
AGGREGATED INNOVATION INDEX	45.2	1.5	3
Human Resources	33.5	–4.8	–4.8
Attractive research systems	27.6	16.7	4.2
Digitalization	47	4.8	4.8
Finance and support	22.6	–7	2
Company investments	35.1	–6.5	–0.1
Use of information technology	35.9	–26.1	–9.8
Innovators	56	56.7	27.8
Links	34.4	24.2	15.8
Intellectual assets	74.1	–27.8	–6.2
Impact on employment	55.3	21.4	9.6
Impact on sales	60.6	31.1	11.2
Environmental sustainability	53.5	–26.6	–3.5

As the table above shows, Bulgaria belongs to the group of emerging innovators with a performance of 45.2% of the EU average.

Table 2. European Innovation Scoreboard 2022, Romania (source: European Commision, 2022d)

Bulgaria	Performance relative to the European Union in 2022	Productivity change 2015–2022	Productivity change 2021–2022
AGGREGATED INNOVATION INDEX	45.2	1.5	3
Human Resources	33.5	–4.8	–4.8
Attractive research systems	27.6	16.7	4.2
Digitalization	47	4.8	4.8
Finance and support	22.6	–7	2

End of Table 2

Bulgaria	Performance relative to the European Union in 2022	Productivity change 2015–2022	Productivity change 2021–2022
Company investments	35.1	–6.5	–0.1
Use of information technology	35.9	–26.1	–9.8
Innovators	56	56.7	27.8
Links	34.4	24.2	15.8
Intellectual assets	74.1	–27.8	–6.2
Impact on employment	55.3	21.4	9.6
Impact on sales	60.6	31.1	11.2
Environmental sustainability	53.5	–26.6	–3.5

In Table 2 we observe the same indicators for Romania and we can conclude that its performance score relative to the European Union average is 32.6%.

Table 3. European Innovation Scoreboard 2022, Croatia (source: European Commision, 2022c)

Bulgaria	Performance relative to the European Union in 2022	Productivity change 2015–2022	Productivity change 2021–2022
AGGREGATED INNOVATION INDEX	45.2	1.5	3
Human Resources	33.5	–4.8	–4.8
Attractive research systems	27.6	16.7	4.2
Digitalization	47	4.8	4.8
Finance and support	22.6	–7	2
Company investments	35.1	–6.5	–0.1
Use of information technology	35.9	–26.1	–9.8
Innovators	56	56.7	27.8
Links	34.4	24.2	15.8
Intellectual assets	74.1	–27.8	–6.2
Impact on employment	55.3	21.4	9.6
Impact on sales	60.6	31.1	11.2
Environmental sustainability	53.5	–26.6	–3.5

The Table 3 we append to our analysis presents the productivity results for Croatia, which is also among the rising innovators. The performance is 66.5% of the European Union average.

The above three tables express the difference in the performance of the three countries compared to the European Union – Bulgaria and Romania show an increasing gap, while in Croatia the gap is getting smaller.

It's time to look at the Global Innovation Index 2022. We will again present in tabular form the performance of the three countries we compare on a number of indicators (Table 4).

Table 4. Global Innovation Index 2022 – Bulgaria, Romania, Croatia (source: Global Innovation Index Database, WIPO, 2022, pp. 50–51)

Indicator		Bulgaria	Romania	Croatia
Institutions	Evaluation	55.9	54.1	52.6
	Rank	67	75	77
Human capital and research	Evaluation	30.50	29	36.9
	Rank	68	74	46
Infrastructure	Evaluation	54.7	54.8	56.2
	Rank	34	33	31
Market experience	Evaluation	33.4	33.2	35.1
	Rank	62	63	56
Business experience	Evaluation	36.4	31.4	32.6
	Rank	40	51	46
Knowledge and technology outcomes	Evaluation	35.4	34.8	29.0
	Rank	30	31	45
Creative results	Evaluation	38.3	20.7	28
	Rank	23	57	39

The comparison of our country according to indicators at the European level with countries of the same group of innovators is important because it contributes to the formulation of ideas about the innovative development of our country according to the European innovation policies.

The comparison using an international index broadens our view beyond the European Union and European countries to identify the important indicators for global evaluation through compliance with European policies in the compared countries.

Having analyzed which of the innovation indicators are relevant to the industrial sector and have a bearing on the development of industry in Bulgaria, we can formulate a model for assessing the state of innovation development.

4. Model for assessing the state of innovation development

On the basis of the presented statistical data and the analysis of the indicators that include the innovation development assessment tools, we will propose a model to formulate an assessment of the innovation development

of the industrial enterprise that is applicable at the sectoral level.

By including key indicators that are used as the basis of models for evaluating innovation development at the European and global level, we can reliably build a model for evaluating the innovation development of industrial enterprises in Bulgaria by assessing the state of enterprises in the industrial sector On the side. This assessment will contribute to the identification of the problem areas of industrial development that must be emphasized in order for our country to be competitive on European and world markets with its innovative activity.

In our opinion, the main indicators for the assessment of innovation development are the following:

- Resources;
- Funding;
- Creativity;
- Energy intensity;
- Digitalization;
- Investment;
- Research and Development;
- Added value.

The graphically presented model for evaluating the innovation development of the industrial sector in Bulgaria based on the evaluation of the innovation development of industrial enterprises can be presented as Figure 1.

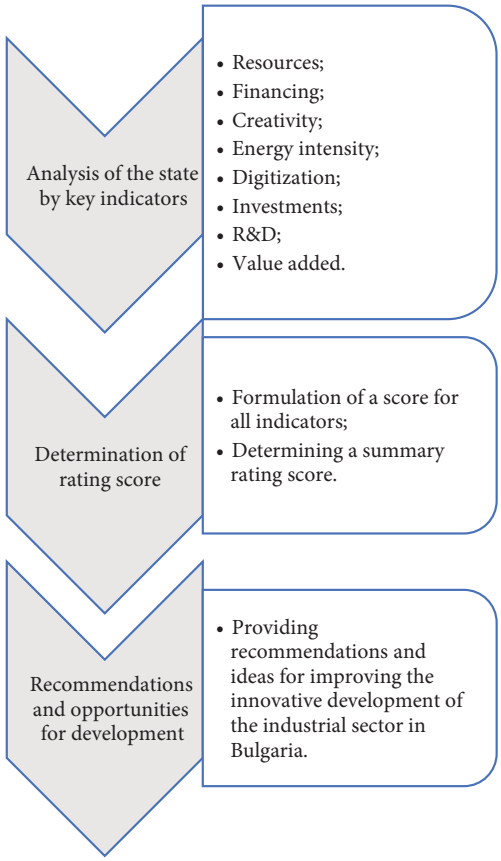

Figure 1. Model for evaluating the innovation development of the industrial sector in Bulgaria (source: Author's systematization)

On the basis of a comparison between the individual enterprises in the analyzed sector according to the listed indicators, we can determine the rating of a given enterprise among the others according to the level reached in the defined indicator. In this way, the strengths and weaknesses of the enterprise relative to the others can be highlighted and an objective assessment of the current state of the enterprise can be formulated. According to this assessment, management decisions can be taken for successful development in the field of innovation.

Conclusions

The economic growth of the country is directly linked to the innovative development of the enterprises in the industrial sector. They in turn must strive to meet the demands imposed by the current political, economic and environmental environment. Our membership of the European Union is one of the main reasons why we should strive to pursue an active innovation policy in order to catch up in terms of performance and evaluation with other countries that have a similar innovation development to ours.

The main goal of this article is to propose a model for evaluating the current state of innovation development of industrial enterprises in Bulgaria.

The main objective formulated in this way is fulfilled by carrying out the set research tasks in relation to the objective.

A literature review was carried out on the researched topic. Through it, it becomes clear why the innovative development of industrial enterprises is important for a country and how the national innovation policy must be in sync with European and international requirements to ensure the competitiveness of enterprises and therefore more effective innovation activity. It is important to take into account the key goals in innovation productions in relation to requirements for basic factors on which innovation development depends.

The second task has also been fulfilled by analyzing the main tools and their way of application and interpretation of the results in connection with the evaluation of the innovation development of certain countries at the national level.

Through this analysis, transforming the results presented for a group of countries close in terms of economic and innovation development to Bulgaria, to information important for identifying strengths and weaknesses in the innovation activity of our country, we can get an idea of the indicators that should be of focus on increasing the results of innovation activity of industrial enterprises in Bulgaria.

After identifying the main indicators that need to be improved in comparison with the values of countries close to Bulgaria as indicators, we can formulate a model for evaluating innovation development, in which the lower-scoring indicators from the European and global indices will be included.

The essence of the proposed evaluation model is to perform a rating evaluation at the enterprise level, taking into account the evaluations of all the investigated indicators. The summary ball assessment presents information on innovation development and its state at the sectoral level, with the key national sectors applying innovation policy in their industrial activity providing an opportunity to gain insight into the state of innovation development in the industrial sector at the national level.

The last research task to the set goal of the present development was achieved by identifying the indicators that deserve attention in connection with the improvement of innovation activity and the increase of innovation development. Opportunities and ideas to improve innovation development should include proposals regarding the indicators with lower results compared to other countries of the same group of innovators.

In conclusion, we can summarize that the innovation development of the enterprise is a systematic process that must be continuously improved. It is important to be in sync with the industrial requirements imposed by the modern market, to satisfy consumer demand, while at the same time doing so with care for the environment.

It is particularly important to apply creative solutions to achieve more efficient use of resources and energy and to achieve higher added value from the products produced.

Our country's national priorities for a "Green" and sustainable Bulgaria should be embedded in every manufacturing initiative at sector and enterprise level. In this way, we will improve our performance in areas of innovation development that are experiencing negative movement compared to previous periods. These are the areas of human resources, financing and support for innovation, company investment, the significant decline in the indicators Use of Information Technology and Intellectual Assets. Last but not least, we have to take into account the decline in the Environmental Sustainability indicator.

By following an effective innovation policy and taking a cue from successful countries with similar and more advanced innovation development to ours, we will be able to build a more competitive industry that will contribute to the sustainable economic development of our country.

Disclosure statement

The authors do not have any competing financial, professional, or personal interests from other parties.

References

Chobanova, R. (2003). Innovations and economic development. *Economic Thought*, 2, 3–35.

Council of Ministers of the Republic of Bulgaria. (2022). *National recovery and resilience plan*. Retrieved January 26, 2023 from https://www.nextgeneration.bg/14

Dimitrova, R. (2022). State of education and training of adults in Bulgaria. In *Yearbook of the College of Tourism* (vol. 1/2022, pp. 18–32).

Dimitrova, R., & Sotirova, A. (2020). Human resource management within the context of innovational development of the enterprise. In Ł. Burkiewicz & A. Knap-Stefaniuk (Eds.), *Management – Tourism – Culture. Studies and Reflections on Tourism Management* (pp. 161–174). Ignatianum University Press.

European Commision. (2022a, September 22). *European innovation scoreboard*. Retrieved January 20, 2023, from https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

European Commision. (2022b, September 22). *Scientific research and innovation*. Retrieved September 20, 2023, from Country profiles: EU, Bulgaria. https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-bg.pdf

European Commision. (2022c, September 22). *Scientific research and innovation*. Retrieved September 20, 2023, from Country profiles: EU, Croatia. https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-hr.pdf

European Commision. (2022d, September 22). *Scientific research and innovation*. Retrieved September 20, 2023, from Country profiles: EU, Romania. https://ec.europa.eu/assets/rtd/eis/2022/ec_rtd_eis-country-profile-ro.pdf

European Regional Development Fund. (n.d.). *OPIC, New program period 2021–2027*. Retrieved January 26, 2023, from https://opic.bg/opik/nov-programen-period-2021-2027-g

Global Innovation Index Database. (2022, September). *Global Innovation Index 2022. What is the future of innovation driven growth?* (15th ed.). WIPO. Retrieved January 20, 2023, from Global Innovation Index: https://www.globalinnovationindex.org/gii-2022-report

Hall, B., Mairesse, J., & Mohnen, P. (2010). Measuring the returns to R.&D. In B. Hall & N. Rosenberg (Eds.), *Handbook of the economics of innovation* (pp. 1033–1082). North Holland.
https://doi.org/10.1016/S0169-7218(10)02008-3

Kalaidzhieva, V. (2016). Organizational and management approaches in the implementation of the innovation process in the enterprises of the industrial sector. *Economics and Social Alternatives*, 3, 99–108.

Kondratieff, N. (1984). *The long wave cycle.* E P Dutton.

Kuznets, S. (2016). *Six lectures on economic growth.* Routledge.
https://doi.org/10.4324/9781315443089

Kyurova, V. (2013). Assessment of the innovation activity of the entrepreneurial business. *Economics and Management*, *9*(3), 20–25.

Kyurova, V. (2020). Study on the creativity of the entrepreneurial business. *Revista Inclusiones, Vol. 7, num Especial: Abril-Junio*, 355–366.

Kyurova, V., & Koyundzhiyska-Davidkova, B. (2020). Research of entrepreneurial business innovations in times of crisis. *Revista Inclusiones, Vol. 7, num Especial: Octubre-Diciembre*, 199–209.

Kyurova, V., & Yaneva, D. (2017). Research on the impact of the corporate image on the competitiveness of interior design enterprises. In *CBU International Conference Proceedings* (vol. 5, pp. 495–498). Prague, Czech Republic: https://ojs.journals.cz/index.php/CBUIC/issue/view/81

Lapaev, P. (2016). Methodological foundations of innovative enterprise development. *Intelligence. Innovations. Investments*, 36–41.

Lu, Y. (2017). Industry 4.0: A survey on technologies, applications and open research issues. *Journal of Industrial Information Integration*, *6*, 763–769. https://doi.org/10.1016/j.jii.2017.04.005

Mensch, G. (1979). *Stalemate in technology: Innovations overcome the depression.* Ballinger Publishing Company.

Ministry of Economy of Republic Bulgaria. (n.d.). *National Innovational Fund*. Retrieved January 23, 2023, from Executive Agency for the Promotion of Small and Medium Enterprises. https://www.sme.government.bg/?page_id=17643

Ministry of Finance of Republic Bulgaria. (2020a). *Appendix 1 – Vision, goals and priorities of the National Development Program BULGARIA 2030.* Retrieved January 20, 2023, from National Development Program: Bulgaria 2030: https://www.minfin.bg/bg/1394

Ministry of Finance of Republic Bulgaria. (2020b). *National Development Program BULGARIA 2030*. Retrieved January 23, 2023, from Ministry of Finance: https://www.minfin.bg/bg/1394

Ministry of Innovation and Growth of Republic Bulgaria. (2022, August). *Innovation Strategy for Smart Specialization 2021–2027*. Retrieved January 26, 2023, from https://www.strategy.bg/PublicConsultations/View.aspx?lang=bg-BG&Id=7006

Morozov, D. (2010). Principles of innovative enterprise development. *Current Issues of Economic Sciences*, *15*(1), 181–185.

Morozov, Y. (2005). *Innovational management.* UNITY-DANA.

Ogoleva, R. (2004). *Innovational management.* Financial Academy under the Government of the Russian Federation.

Plotnikov, A. (2014). Innovative development and economy of enterprises. *Innovative Activity*, 1–1(28), 47–53.

Schumpeter, J. (2017). *Theory of economic development.* Routledge. https://doi.org/10.4324/9781315135564

Shevchenko, S. (2010). Innovation as a key category of innovation economy: Basic approaches to defining concepts. *Questions of Economic Sciences*, *5*(44), 7–10.

Waterman, R. (2008). *Update factor – how the best companies maintain competitiveness.* Progress.

Witkowski, K. (2017). Internet of Things, Big Data, Industry 4.0 – innovative solutions in logistics and supply chains management. *Procedia Engineering*, *182*, 763–769. https://doi.org/10.1016/j.proeng.2017.03.197

Yaneva, D. (2021). *Strategic decisions in the management of the marketing activity of the enterprise.* Blagoevgrad: University of Economics "N. Rilski".

Yuleva-Chuchulaina, R. (2021a). Digital business transformation. *Jubilee Scientific Conference "Challenges for Contemporary Economic Science – Sustainability and Digitalization"* (pp. 54–60). Blagoevgrad: SWU "Neofit Rilski".

Yuleva-Chuchulaina, R. (2021b, June). Impact of the COVID-19 pandemic on the innovation activity and competitiveness of small and medium-sized enterprises from the Southwest Region of Bulgaria. In *Collection of scientific reports – XIX International Scientific Conference "Management and Engineering'21"* (pp. 314–320). Sozopol.

Yuleva-Chuchulaina, R. (2019). Innovations – a source of competitive advantages in small and medium enterprises. In *Innovations and entrepreneurship in education and business* (pp. 111–123). Sofia: International Higher Business University. https://ibsedu.bg/media/Conference/2019/Section_3._Transformation_of_modern_business_models.pdf

Zharov, V. (2011). Formation of innovative activity analysis. *Problems of Social and Economic Development of the North Region*, *10*, 5–10.

Zhuravlev, V. (2010). The innovation industry is the most important part of the innovation-creative economy. *Creative Economy*, *4*(3), 49–55.