
INVENTION AND PATENT ACTIVITY IN BULGARIA IN THE PERIOD 2012–2017

Plamen M. Pavlov¹

¹ *University of Economics, Varna, Bulgaria*

E-mail: ¹ pavlov@ue-varna.bg

Abstract: Patents provide for serious protection for inventors, thereby enabling them, on the one hand, to recover costs faster and, on the other, to gain a larger market share or to protect existing positions in a competitive environment. In this regard, the purpose of the article is to identify the dynamics and trends in the invention activity of national and foreign applicants, and on this basis to draw conclusions and guidelines that would be useful for the business. The research uses a systematic approach, analysing data from the database of the Patent Office of the Republic of Bulgaria for the period 2012–2017. The survey shows that Bulgaria is of interest to patent holders mainly from the EU, US, Switzerland and JAPAN. On the other hand, the Bulgarian applicants are sufficiently active in the invention activity, which has an effect on the competitiveness of the national economy.

Keywords: invention activity, patents, innovations.

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Introduction

In our days, new technologies and innovations are a must in maintaining high competitiveness and economic growth in the economy and well-being of people. It is no accident that the vast majority of the world's leading companies are highly innovative according to Ceoworld.biz (2019). What is more - even those who develop traditional businesses apply a variety of cutting edge technologies in manufacturing, sales, communications, supplier and customer relationships, etc. With the advancement of the 21st

century, the speed of development and implementation of new products and services, which give different advantages to companies over their competitors, is also accelerating. To ensure that an innovation will not be immediately duplicated by competition, that they will enjoy exclusive rights to their innovation achievements for as long as possible, large companies, as well as small companies and individual inventors, resort to the instruments of patent law. Indeed, security is not the only reason to resort to patenting. According to the World Intellectual Property Organization - WIPO (2019), thanks to patents, inventors can gain a strong market position, a higher return on investment, the opportunity to license or sell the invention, a positive image, etc.

Information in patent offices on the documents that protect inventions and utility models that can be acquired by their authors can be extremely useful for analysing various interests in markets, regions, specific scientific fields, etc.

The article deals with both patents issued between 2012 and 2017¹ by the Bulgarian Patent Office, and those issued by the European Patent Office, valid on the territory of the Republic of Bulgaria, the description and the patent claims in which is provided in Bulgarian. The object of the study is the invention activity in Bulgaria as well as the activity of the foreign applicants, who wish to have their patents effective on the Bulgarian territory.

The main research purpose of the article is to identify the dynamics and trends in the invention activity of our and foreign applicants and to draw conclusions and directions that are useful both for the academic community and for the business which would be interested in specific high achievements, new technologies and innovations in various fields.

The main objectives of the study, in conformity with its purpose, are:

1. To explore the theoretical and methodological aspects of invention and patent activity;
2. To analyse the Bulgarian and the foreign invention activity on the territory of the Republic of Bulgaria for the period 2012-2017;
3. To draw core conclusions about the invention activity of Bulgarian and foreign inventors with patents effective on the territory of the Republic of Bulgaria.

The research methodology of the study is based on the systematic approach. Various research methods and approaches have been used to address the formulated research tasks, including methods of analysis and synthesis, inductive and deductive, comparison of cause and effect relation-

¹ After April 2018, a number of patents for inventions do not indicate the nationality of the patent holder, which does not allow conducting complete comprehensive analyses after that period, based only on data from the Official Gazette of the Patent Office.

ships, as well as systemic, complex, integrated, interdisciplinary and historical methods.

The primary source of information of this study is the Official Gazette of the Patent Office of the Republic of Bulgaria for the period 2012-2017. It provides for new information on technical and technological achievements in the economy, including in industries that reflect to a large extent the level of innovation of the national economy, the priority sectors, the sectors of the highest innovation activity, as well as the sectors that are most attractive to foreign investment. Data was collected manually from the Official Gazette of the Patent Office of Republic of Bulgaria.

1. Theoretical foundations of the paper

Research and innovation provide for new solutions to existing problems or, in other words, create inventions, utility models, and industrial designs. Complying with the requirements laid down in the Patents and Utility Model Registration Act (SG No. 64/2006) for worldwide novelty, inventive step and industrial application, patentable inventions can be justifiably considered as cutting-edge innovation.

"An invention" is the solution of a particular problem related to the creation of a new product, technology, process or method. According to the Law on Patents and Registration of Utility Models (Art. 6 - SG 64/06) in the Republic of Bulgaria, 'inventions from all fields of technology that are new, have an inventive step and are industrially applicable are patentable'. The definition identifies three main features:

- ✓ novelty – i.e. no written or verbal descriptions anywhere in the world before the filing date or the priority date as appropriate, of the patent application;

- ✓ inventive step - the invention has an inventive step, if having regard to the state of the art at the filing date or the priority date, respectively, it is not obvious to a person skilled in the art;

- ✓ industrial application – susceptible to industrial application are the inventions the subject matter of which can be made or used repeatedly in any branch of industry or agriculture.

It is clear that legislation seeks to avoid the grant of inapplicable patents and to stimulate innovations and their use in practice. It is not enough for people to have good ideas which to patent. It is more important to transform these ideas into viable innovations, because only then we can expect a positive effect on the economy.

Patent-protected inventions are of particular interest because, on the one hand, they are largely used on the market (it is economically unjustified

and irrational to pay fees for having them if they are not used or if they are not going to be used on the market). On the other hand, they refer to worldwide novelty, not continental, national, regional, market-specific or enterprise-specific. Last but not least, large volumes of research and serious funding are needed to obtain a patent.

Patent information may be obtained on the level of invention activity. It is recent, specific, tested through specialized expertise, made by specialized bodies (in Bulgaria it is the "Patent Office") and provides for detailed information on the level of scientific and technical progress and innovation.

Patent information has some basic features that make it extremely valuable and useful:

- It is ahead of all other types due to the requirement for novelty;
- It reflects fully and specifically the new developments in science, technology and manufacturing;
- It contains not only technical information but also legal information;
- It is absolutely trustworthy.

Patent information is found in the patent literature, which can be classified as primary and secondary. The primary sources cover descriptions of discoveries, inventions, trademark claims, industrial designs and utility models. It also includes communications regarding patent proceedings published in the Official Gazettes. The secondary patent literature refers to the results of the revision of the primary, namely reports, annotations, etc.

Patent information is categorised according to an international patent classification. It is a hierarchical system of the following levels: Sections; Classes; Subclasses; Groups; Subgroups.

The highest classification level is the Section. All human technical knowledge is arranged in 8 sections in capital Latin letters:

- A. Human Necessities;
- B. Performing Operations; Transporting;
- C. Chemistry; Metallurgy;
- D. Textiles; Paper;
- E. Fixed Constructions;
- F. Mechanical Engineering; Lighting; Heating; Weapons; Blasting,
- G. Physics;
- H. Electricity.

The eight Sections are subdivided into 115 classes each of which indicated by a two-digit number. These classes are further subdivided into Subclasses, Groups and Subgroups.

Patent literature is distinguished by a number of features that give it certain advantages over other types of scientific and technical literature. Станев и Павлов (2016) summarise these advantages as follows:

- It gives **beforehand information** due to the requirement for novelty of the invention. A publication before filing the application would infringe the requirement for novelty and would be a reason not to grant a patent. Therefore, the patent description precedes at least a year or two other scientific and technical publications on the issue under consideration;

- The patent literature is **specific**. It reflects most fully and precisely the latest developments in science and technology. This arises from the requirement for a detailed description and for observance of well-defined rules (standardised to a high extent) in the description of the invention;

- An important feature of patent literature is its **credibility**. It is guaranteed by the requirement of feasibility and repeated use of the invention. In addition, the patent description is subject to prior scientific and technical and patent expertise, and as a rule does not contain promotional or misleading information;

- Patent literature is **critical**, due to the section on "criticism of the prior art" in the description. This section notes the shortcomings of previous technical solutions and proposes new, more sophisticated solutions. Thus, patent literature gives an idea not only of the advantages but also of the disadvantages of already protected technical solutions.

A particularly important feature of patent literature is its **systematization**. In countries with developed patent law, patent literature is grouped in special patent funds, with patents classified by special classification systems, which facilitates their finding and use.

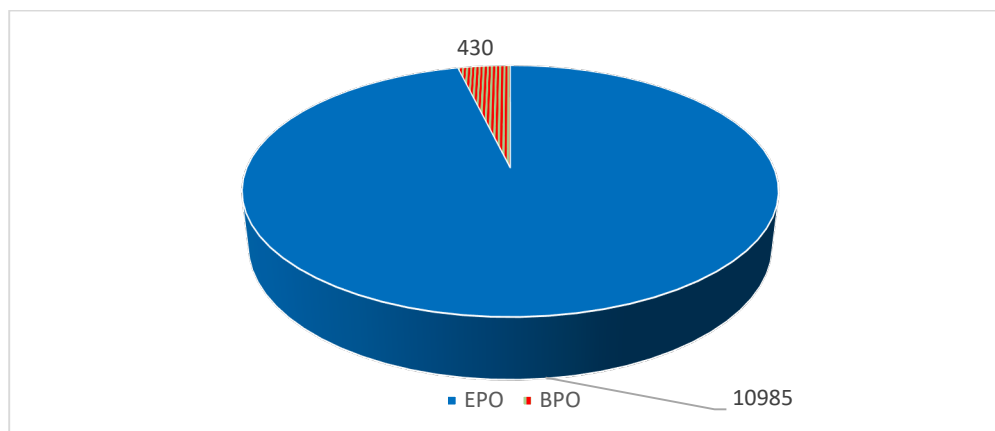
According to WIPO, patent information can also be extremely useful for the commercial strategy of a business or an organisation, especially in finding business partners; suppliers of materials or equipment; identifying market niches; tracing the activity of the competition, etc.

An analysis of patent information can predict what future developments are expected in the economy and in its individual industries or in different markets. This information can be used to develop strategies in the fields of marketing, import and export activities, investments, but mostly gives an idea of innovative activity in different countries. This is the reason underlying the conducted analysis of patents on inventions in force in the Republic of Bulgaria issued in the period 2012-2017².

² According to data from the Patent Office in our country, patent descriptions have been published since 1921, when Bulgaria became a member of the Paris Union. Between 1921 and 1944 6933 patents were issued and the holders of 680 of them were Bulgarian nationals. The descriptions of these patents were destroyed in World War II. From 1944 to 1963, 350 copyright certificates and 462 patents were issued. In 1963, a single numbering for authorizations and patents was introduced, still valid today. Since 1950, more than 50,000 copyright certificates and patents have been issued.

2. Invention activity in the period 2012-2017.

A total number of 11415 invention patents were reviewed, all issued in the period 2012-2017, 10985 issued by the European Patent Office (EPO) and 430 by the Patent Office of the Republic of Bulgaria - BPO.



Source: Official Gazette of the Patent Office of Republic of Bulgaria

Figure 1. Patents for inventions effective on the territory of Republic of Bulgaria for the period 2012–2017

The big difference in the number of patent certificates in force on the territory of Bulgaria, issued by both agencies is striking. The reasons are various, but one of the most important is that European patent protection can be obtained for all countries in the community through a single procedure. On the other hand, it is appropriate for individual inventors or organizations with lower budgets, especially those that have interests mainly on the Bulgarian market, to benefit from the relatively lower fees in the BPO. Another reason for the much smaller number of patents granted in Bulgaria is that mostly Bulgarian inventors apply for patents at the BPO - almost 70% of all patents (see Table 1), while our country is not among the leading in the field of innovation and new technologies.

The breakdown of patents by section and country for the period under review is as follows (Table 1)

Table 1

**Patents granted by the BPO and the EPO for the period 2012–2017
valid on the territory of the Republic of Bulgaria**

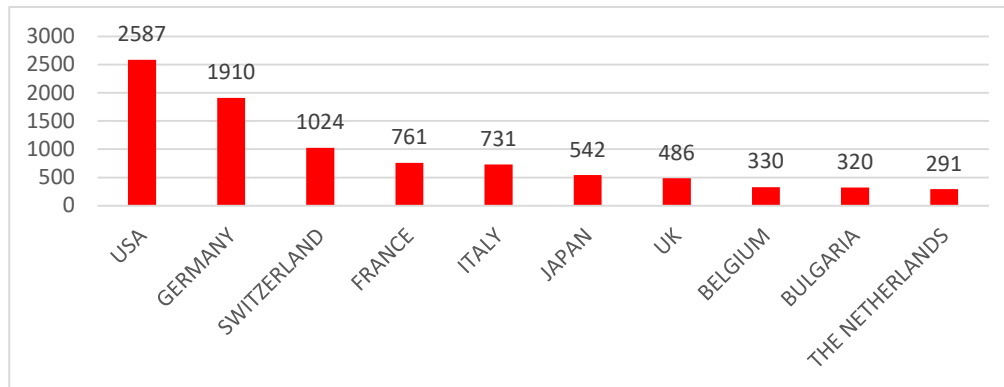
TOTAL FOR 2012-2017	A	B	C	D	E	F	G	H	ОБЩО
The USA	1004	104	1229	16	25	32	103	47	2560
GERMANY	449	415	506	8	137	150	80	143	1888
SWITZERLAND	363	158	380	2	13	34	20	43	1013
FRANCE	207	84	335	5	14	34	37	36	752
ITALY	259	156	142	12	43	62	26	28	728
JAPAN	168	23	291	2	2	5	25	26	542
UNITED KINGDOM	162	67	198	2	13	17	19	7	485
BELGIUM	117	25	141	1	17	7	12	3	323
THE NETHERLANDS	89	53	73	4	13	14	22	21	289
AUSTRIA	60	101	38	2	19	17	19	10	266
SPAIN	87	29	72	1	10	4	5	6	214
SWEDEN	64	25	74	1	9	7	8	10	198
DENMARK	62	28	73	0	2	2	3	2	172
CHINA	30	7	27	2	2	3	1	58	130
FINLAND	9	20	47	5	14	9	15	8	127
SOUTH KOREA	16	4	21	0	2	0	2	58	103
CANADA	35	11	45	1	1	3	3	2	101
LUXEMBOURG	46	11	29	0	3	3	0	3	95
IRELAND	41	9	37	0	2	2	1	0	92
POLAND	39	17	13	1	10	7	0	5	92
ISRAEL	57	4	24	0	3	1	2	0	91
NORWAY	37	12	14	0	1	2	4	4	74
TURKEY	37	10	8	1	5	6	1	0	68
AUSTRALIA	24	9	16	0	4	7	2	2	64
INDIA	20	1	29	0	0	0	0	3	53
CZECH REPUBLIC	11	6	11	2	3	3	3	2	41
RUSSIA	16	3	10	0	1	6	1	0	37
HUNGARY	15	1	14	0	0	0	0	1	31
BAHAMAS	8	3	13	1	1	0	1	0	27
GREECE	11	3	5	0	5	0	0	2	26
PORTUGAL	9	5	9	0	0	0	0	0	23
TAIWAN	6	4	4	2	4	1	1	1	23
BULGARIA	2	6	3	0	5	4	1	2	23
CYPRUS	8	7	2	1	0	0	0	2	20
LIECHTENSTEIN	10	0	9	0	1	0	0	0	20
VIRGIN ISLANDS	5	1	6	0	0	2	0	1	15
SLOVENIA	6	3	2	0	1	0	0	3	15
SINGAPORE	3	0	7	0	1	1	0	1	13
NEW ZEALAND	6	4	2	0	0	1	0	0	13
SOUTH AFRICA	7	2	1	0	1	0	0	0	11
BERMUDA	6	0	5	0	0	0	0	0	11
MEXICO	5	1	3	0	1	0	0	0	10
CURACAO	1	2	4	3	0	0	0	0	10
CUBA	7	0	3	0	0	0	0	0	10
MALAYSIA	3	2	1	0	0	0	0	2	8

HONG KONG	4	0	0	1	0	0	2	0	7
LATVIA	0	0	6	0	0	0	0	0	6
SLOVAKIA	1	1	2	1	0	1	0	0	6
CAYMAN ISLANDS	1	0	4	0	0	0	0	1	6
MALTA	3	0	3	0	0	0	0	0	6
BRAZIL	2	0	0	1	0	2	0	0	5
CROATIA	1	0	0	0	1	0	2	0	4
CHILE	1	2	0	0	1	0	0	0	4
ICELAND	2	0	1	0	0	0	0	0	3
UAE	1	2	0	0	0	0	0	0	3
ROMANIA	0	2	0	0	0	0	1	0	3
ESTONIA	0	1	0	0	0	1	0	1	3
EGYPT	1	0	0	0	1	0	0	0	2
PANAMA	1	1	0	0	0	0	0	0	2
SAUDI ARABIA	1	0	1	0	0	0	0	0	2
ARGENTINA	2	0	0	0	0	0	0	0	2
AZERBAIJAN	0	1	0	0	1	0	0	0	2
MONACO	2	0	0	0	0	0	0	0	2
MOLDOVA	0	0	0	0	0	0	0	1	1
SAINT VINC. AND GREN.	0	0	0	0	0	1	0	0	1
LEBANON	1	0	0	0	0	0	0	0	1
TUNISIA	1	0	0	0	0	0	0	0	1
ANTIGUA	1	0	0	0	0	0	0	0	1
BARBADOS	1	0	0	0	0	0	0	0	1
PUERTO RICO	1	0	0	0	0	0	0	0	1
MAURITIUS	0	1	0	0	0	0	0	0	1
BANGLADESH	1	0	0	0	0	0	0	0	1
BELARUS	1	0	0	0	0	0	0	0	1
Total by sections	3657	1447	3993	78	392	451	422	545	
									Total: 10985
PATENTS GRANTED BY THE BULGARIAN PATENT OFFICE									
	A	B	C	D	E	F	G	H	
BULGARIA	27	59	47	2	17	23	58	64	297
THE USA	10	1	14	0	0	0	2	0	27
GERMANY	9	0	12	0	0	0	1	0	22
SWITZERLAND	8	0	2	0	0	0	1	0	11
FRANCE	6	0	2	0	0	0	0	1	9
BELGIUM	5	1	1	0	0	0	0	0	7
SWEDEN	2	0	4	0	0	0	0	0	6
NORWAY	3	0	2	0	0	0	0	0	5
IRELAND	0	0	4	0	0	0	1	0	5
SPAIN	0	0	3	0	0	0	0	0	3
DENMARK	1	0	2	0	0	0	0	0	3
ITALY	1	0	1	0	0	1	0	0	3
FINLAND	1	0	2	0	0	0	0	0	3
RUSSIA	0	1	1	0	0	0	1	0	3
SOUTH KOREA	2	0	0	0	0	0	0	0	2
CANADA	1	0	1	0	0	0	0	0	2
SLOVENIA	1	0	0	0	0	0	0	1	2
CUBA	0	0	2	0	0	0	0	0	2

HUNGARY	1	0	1	0	0	0	0	0	2
THE NETHERLANDS	0	1	1	0	0	0	0	0	2
TURKEY	0	1	1	0	0	0	0	0	2
BAHAMAS	0	0	1	0	0	0	0	0	1
CHINA	1	0	0	0	0	0	0	0	1
PORTUGAL	0	0	0	0	1	0	0	0	1
AUSTRALIA	0	0	1	0	0	0	0	0	1
ISRAEL	0	1	0	0	0	0	0	0	1
BERMUDA	1	0	0	0	0	0	0	0	1
UNITED KINGDOM	0	0	1	0	0	0	0	0	1
JAPAN	1	0	0	0	0	0	0	0	1
INDIA	1	0	0	0	0	0	0	0	1
UKRAINE	1	0	0	0	0	0	0	0	1
CZECH REPUBLIC	0	1	0	0	0	0	0	0	1
GREECE	1	0	0	0	0	0	0	0	1
Total by sections	84	66	106	2	18	24	64	66	430
	A	B	C	D	E	F	G	H	

Source: Official Gazette of the Patent Office of Republic of Bulgaria

The ten countries of the highest number of patents on the Bulgarian territory³ are: 1. the USA – 2587; 2. Germany – 1910; 3. Switzerland – 1024; 4. France – 761; 5. Italy – 731; 6. Japan – 542; 7. UK – 486; 8. Belgium – 330; 9. **Bulgaria** – 320; 10. the Netherlands – 291.



Source: Official Gazette of the Patent Office of Republic of Bulgaria

Figure 2. Countries of the highest number of patents registered, 2012–2017, effective on the Bulgarian territory

³ Patents for inventions, issued both by the Patent Office of Republic of Bulgaria and the European Patent Office.

All top ten countries (with the exception of Bulgaria, which is a "host country" after all) are among the world's most innovative economies, and it is very logical that their companies or individual inventors are the most numerous among patent holders operating on our territory as well. The Bulgarian market, although small in comparison to many others, is after all part of the European market and this can also be taken as a reason for this interest.

The importance of the EU market for our economy in this case is also evidenced by the fact that 6296 (55.16%) of the patents for inventions effective on the Bulgarian territory are held by patent holders from the EU. In fact, the only EU member state that has not registered a patent with effect on the Bulgarian territory for the period under review is Lithuania. This can be interpreted primarily as a lack of interest by the Lithuanian business, science and invention activity in the Bulgarian economy, rather than a low innovativeness because, according to the Global Innovation Index (2019), Lithuania ranks 38th in the world (Bulgaria ranks 40th).

Regarding the distribution of registered patents by section - most of them are in section C - Chemistry and Metallurgy; A - Human Necessities and B – Performing Operations and Transporting. (Table 2 and Figure 3).

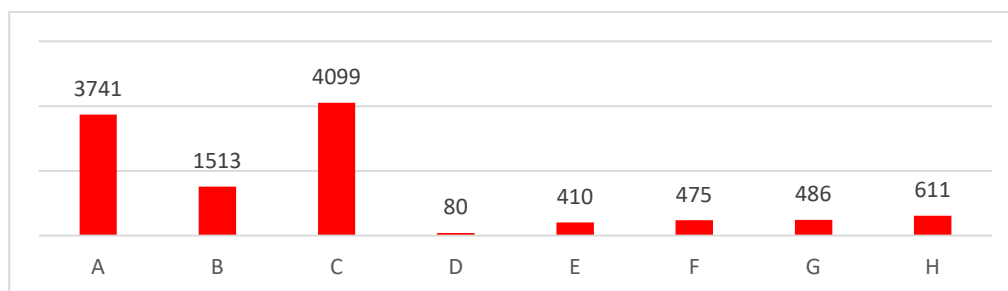
Table 2

Distribution of patents by section

A	B	C	D	E	F	G	H
3741	1513	4099	80	410	475	486	611

Source: Official Gazette of the Patent Office of Republic of Bulgaria

The fewest in number are the patents in section D - Textiles and Paper; however, this trend has been characteristic for the latest over 30 years⁴.



Source: Official Gazette of the Patent Office of Republic of Bulgaria

Figure 3. *Distribution of patents by section*

⁴ According to a research presented in the dissertation of the author.

It should also be noted that the patents in Section H rank fourth, after the already mentioned Sections C, A and B, which is primarily due to the development of new products and technologies in mobile and electronic communications in the modern world.

If an analysis of the protected inventions operating in the Bulgarian territory is made on two factors together - by country and by section, interesting information can also be obtained (Table 3). Here, for example, it can be seen in which areas, the respective economies have the most serious interest on the Bulgarian market (and not only on it).

Table 3

Leading countries with patents by section, issued in the period 2012-2017, effective in the Republic of Bulgaria

Section			
A	1. USA – 1014	2. Germany – 458	3. Switzerland - 371
B	1. Germany - 415	2. Switzerland - 158	3. Italy - 156
C	1. USA – 1243	2. Germany - 518	3. Switzerland - 382
D	1. USA – 16	2. Italy – 12	3. Germany - 8
E	1. Germany - 137	2. Italy – 43	3. USA - 25
F	1. Germany - 150	2. Italy – 63	3. Switzerland and France - 34
G	1. USA – 105	2. Germany - 81	3. Bulgaria - 59
H	1. Germany - 143	2. Bulgaria - 66	3. China and South Korea - 58

Source: Official Gazette of the Patent Office of Republic of Bulgaria

Undoubtedly the leading countries with the largest number of patents in several sections are the USA and Germany. The United States has the highest number of patents in areas such as Human Necessities; Chemistry and Metallurgy; Textiles and Paper and Physics and rank third in Mechanical Engineering, Lighting, Heating, Weapons, Blasting. We should go into more detail here and make it clear that, in fact, some of the commonly obtained patents held by US companies or individual inventors are for new drugs, new chemical formulas and combinations or the like, related in one or another way to areas such as pharmaceuticals, medicine and bioengineering. In these fields, a large number of patents are held by German, Swiss and French inventors.

German inventors are leading in fields such as Performing Operations and Transporting; Fixed Constructions; Mechanical Engineering, Lighting, Heating, Weapons, Blasting and Electricity. Although not having the largest number of patents, German inventors are also well represented in the sections

Human Necessities; Chemistry and Metallurgy; Physics and Textiles and Paper.

Swiss companies and individual inventors are most represented in the sections Performing Operations and Transporting; Mechanical Engineering, Lighting, Heating, Weapons, Blasting; Human Necessities and Chemistry and Metallurgy. It is found that German and Swiss inventors have similar priorities, which largely reflects on the structure of their market presence on the Bulgarian market.

Another EU member who also clearly has a strong interest in the Bulgarian market is Italy. It is seriously represented in the sections of Textiles and Paper; Fixed Constructions; Mechanical Engineering, Lighting, Heating, Weapons, Blasting; Performing Operations and Transporting.

We should also mention the relatively good representation of Bulgarian companies, scientific organizations and individual inventors in the sections Electricity and Physics, as well as in Fixed Constructions (where Bulgaria ranks 4th).

China and South Korea have a very strong interest in section Electricity. It should be noted here that there is a big share of patents issued in the period 2012-2017 and operating in our territory from the two countries mentioned in the field of products and technologies in mobile communications and are owned by two of their multinational companies - Samsung and Huawei.

Another interesting cross-section of the various patents in force on Bulgarian territory, issued between 2012 and 2017, is in the geographical aspect. It is quite logical that the number of the European patents is the highest (Tables 1 and 4).

Table 4

Number of patents in Europe issued between 2012 and 2017 in force in Republic of Bulgaria

EUROPE	A	B	C	D	E	F	G	H	Total
GERMANY	458	415	518	8	137	150	81	143	1910
SWITZERLAND	371	158	382	2	13	34	21	43	1024
FRANCE	213	84	337	5	14	34	37	37	761
ITALY	260	156	143	12	43	63	26	28	731
UNITED KINGDOM	162	67	199	2	13	17	19	7	486
BELGIUM	122	26	142	1	17	7	12	3	330
BULGARIA	29	65	50	2	22	27	59	66	320
THE NETHERLANDS	89	54	74	4	13	14	22	21	291
AUSTRIA	60	101	38	2	19	17	19	10	266
SPAIN	87	29	75	1	10	4	5	6	217
SWEDEN	66	25	78	1	9	7	8	10	204

DENMARK	63	28	75	0	2	2	3	2	175
FINLAND	10	20	49	5	14	9	15	8	130
IRELAND	41	9	41	0	2	2	2	0	97
LUXEMBOURG	46	11	29	0	3	3	0	3	95
POLAND	39	17	13	1	10	7	0	5	92
NORWAY	40	12	16	0	1	2	4	4	79
TURKEY	37	11	9	1	5	6	1	0	70
CZECH REPUBLIC	11	7	11	2	3	3	3	2	42
RUSSIA	16	4	11	0	1	6	2	0	40
HUNGARY	16	1	15	0	0	0	0	1	33
GREECE	12	3	5	0	5	0	0	2	27
PORTUGAL	9	5	9	0	1	0	0	0	24
CYPRUS	8	7	2	1	0	0	0	2	20
LIECHTENSTEIN	10	0	9	0	1	0	0	0	20
SLOVENIA	7	3	2	0	1	0	0	4	17
LATVIA	0	0	6	0	0	0	0	0	6
SLOVAKIA	1	1	2	1	0	1	0	0	6
MALTA	3	0	3	0	0	0	0	0	6
CROATIA	1	0	0	0	1	0	2	0	4
ICELAND	2	0	1	0	0	0	0	0	3
ROMANIA	0	2	0	0	0	0	1	0	3
ESTONIA	0	1	0	0	0	1	0	1	3
AZERBAIJAN	0	1	0	0	1	0	0	0	2
MONACO	2	0	0	0	0	0	0	0	2
MOLDOVA	0	0	0	0	0	0	0	1	1
UKRAINE	1	0	0	0	0	0	0	0	1
BELARUS	1	0	0	0	0	0	0	0	1
	2293	1323	2344	51	361	416	342	409	7539
	A	B	C	D	E	F	G	H	

Source: Official Gazette of the Patent Office of Republic of Bulgaria

The largest number of patents in Europe is held by Germany, followed by Switzerland, France, Italy, the United Kingdom, Belgium, Bulgaria, the Netherlands, Austria, Spain, Sweden, Denmark and Finland. In fact, all these countries are members of the EU, with the exception of Switzerland, which is a major partner of the Union and a member of the European Free Trade Association. Russia and Turkey, with which we traditionally have very strong trade relations, are not at the top of the table, mostly because their economies are not among the most innovative⁵, not due to lack of interest in the Bulgarian market.

The American continent has also had a strong interest in the Bulgarian market. The large number of patents is due primarily to the innovativeness of

⁵ The Russian Federation is ranked 46th, Turkey is 49th according to Global Innovation Index 2019.

the US economy, as well as, of course, to some specific interests of US companies, organizations and other inventors in Bulgaria (Table 5).

Table 5
Number of patents from North and Central America issued between 2012 and 2017, in force in Republic of Bulgaria

NORTH AND CENTRAL AMERICA	A	B	C	D	E	F	G	H	TOTA
THE USA	1014	105	1243	16	25	32	105	47	2587
CANADA	36	11	46	1	1	3	3	2	103
BAHAMAS	8	3	14	1	1	0	1	0	28
VIRGIN ISLANDS	5	1	6	0	0	2	0	1	15
CUBA	7	0	5	0	0	0	0	0	12
BERMUDA	7	0	5	0	0	0	0	0	12
MEXICO	5	1	3	0	1	0	0	0	10
CURACAO	1	2	4	3	0	0	0	0	10
CAYMAN ISLANDS	1	0	4	0	0	0	0	1	6
PANAMA	1	1	0	0	0	0	0	0	2
SAINT VINC. AND GREN.	0	0	0	0	0	1	0	0	1
ANTIGUA	1	0	0	0	0	0	0	0	1
BARBADOS	1	0	0	0	0	0	0	0	1
PUERTO RICO	1	0	0	0	0	0	0	0	1
	1088	124	1330	21	28	38	109	51	2789

Source: Official Gazette of the Patent Office of Republic of Bulgaria

While the second position of Canada in the ranking is not surprising, it is interesting that third and fourth in number of patents are the Bahamas and the Virgin Islands. However, this may be due not to the innovativeness and high technology of the Bahamas or the Virginian economy, but to the extremely favourable tax legislation in these countries for which reason many inventors who are foreign to the Bahamas or Virgin Islands prefer to register the firms that hold patents there. A large proportion of patent holders, both in the Bahamas and the Virgin Islands, and in Bermuda and Curacao, are large, usually multinational, companies.

The next continent that is interesting to consider in terms of patents from there, effective in Bulgaria is Asia (Table 6).

Japan has the largest number of registered patents from the Asian continent operating in the Bulgarian territory. This is rather natural, based on the high level of innovation of the Japanese economy. As for the following countries, China and South Korea - both of them show interest in the Bulgarian market. The two countries have the largest number of patents in

section H - Electricity, more specifically in electronics and mobile communications.

Table 6
Number of patents from Asia, issued between 2012 and 2017 effective in Republic of Bulgaria

<i>ASIA</i>	A	B	C	D	E	F	G	H	<i>TOTAL</i>
JAPAN	169	23	291	2	2	5	25	26	543
CHINA	31	7	27	2	2	3	1	58	131
SOUTH KOREA	18	4	21	0	2	0	2	58	105
ISRAEL	57	5	24	0	3	1	2	0	92
INDIA	21	1	29	0	0	0	0	3	54
TAIWAN	6	4	4	2	4	1	1	1	23
SINGAPORE	3	0	7	0	1	1	0	1	13
MALAYSIA	3	2	1	0	0	0	0	2	8
HONG KONG	4	0	0	1	0	0	2	0	7
UAE	1	2	0	0	0	0	0	0	3
SAUDI ARABIA	1	0	1	0	0	0	0	0	2
LEBANON	1	0	0	0	0	0	0	0	1
BANGLADESH	1	0	0	0	0	0	0	0	1
	316	48	405	7	14	11	33	149	983
	A	B	C	D	E	F	G	H	

Source: Official Gazette of the Patent Office of Republic of Bulgaria

Israel and India, ranked fourth and fifth, have the highest number of patents registered in Sections A and C, most of which are directly or indirectly related to medical developments.

Apart from the above mentioned continents, during the period under review, only 9 other countries have registered patents with effect on the territory of Bulgaria. Three of them are from South America with a total of 11 patents, four are from Africa with 15 patents and Australia and New Zealand with a total of 78 patents. In fact, the more interesting is the case of Australia because citizens and businesses from this country have obtained a total of 65 patents, most of them in Sections A and C, and like the US, Germany, Switzerland, Israel and some other countries, a large number of these patents are related to medical developments.

3. Conclusions and guidelines

1. Most Bulgarian patents in the period 2012-2017 were issued in sections H; B; G and C, which contrasts with the activity of the leading countries with the most patents such as the USA, Germany, Switzerland, Japan, France, which hold patents most often in sections A and C.

2. In the fields of high added value and importance in the context of the concept of sustainable development, such as medicine, pharmacy, bioengineering, chemistry, the leading are the American, the German and the Swiss inventors.

3. Germany is the undisputed leader in Performing Operations and Transporting. The same can be said of the sections Electricity and Mechanical Engineering, Lighting, Heating, Weapons, Blasting, in which the number of patents German inventors hold is many times more than the number of patents held by the countries that follow them in the ranking.

4. Bulgaria and the Bulgarian market are the most attractive to patent holders from the EU, US, Switzerland and Japan. To this list we have to add China, South Korea, Canada and Israel, which also have certain interests. The trade policy of Bulgaria in the future should account for this fact and strive to further develop the economic relations with these countries.

5. A priority for the business and the government is to stimulate the invention activity in sections A and C, which are lagging behind the global trends in the leading innovative economies. This, in turn, would also increase the competitiveness of the companies and of the national economy as a whole.

6. The strong invention activity in an economy requires effective support by the state, at least in the following three directions:

First, by creating a good environment for inventors (whether businesses or individuals)⁶.

Second, by indirect impact on the entities involved in invention and innovation activity⁷.

Third, through direct involvement of the state in co-financing the expenditures of the research units, of consultancy assistance for various high-tech projects and others.

In conclusion, it should be noted that, while not having very high innovation and invention potential, Bulgaria should benefit from its EU membership not only in the common market but also in its capacity to

⁶ The Law on Patent and Utility Model Registration currently in force is sufficiently up-to-date, but actions can be taken to strengthen its implementation control, as well as of the other intellectual property acts.

⁷ There are many opportunities here, such as corporate tax relief for inventors, income tax relief for research staff, etc.

cooperate with other interested research organizations, innovative companies and individual inventors, especially in areas where we are lagging behind in global excellence. The state should play a major role in stimulating patent as well as innovation activity for Bulgarian companies and individual inventors, because there are many levers in this field that can be exploited.

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* * *

Plamen M. Pavlov is Head Assistant Professor, PhD in Economics in the Department of Industrial Business, Varna University of Economics, Bulgaria. Research interests: innovation management, organization of labour, intellectual property.

ORCID ID: 0000-0003-4234-8016

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Deyana Vesselinova – technical secretary

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Blagovesta Borisova – computer graphic design

☎ (+359) 882 552 516, e-mail: b.borisova@uni-svishtov.bg

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