

L.V. Tashenova

Ye.A. Buketov Karaganda State University
(E-mail: larisatash_88@mail.ru)

Regional differentiation and the main problems of patent activity in the Republic of Kazakhstan

In the article by the method of cluster analysis reflected the differentiation of regions of Kazakhstan by patent activity. Multidimensional classification of regions of Kazakhstan is carried out by using such indicators of patent activity of subjects of the market by the 2015 year as a number of inventive security documents were issued for inventions, utility models, industrial designs, selection achievements, trademarks. As a result of analysis 7 clusters were obtained. Cluster analysis was allowed to classify the regions of Kazakhstan taking into account features that reflect the essence, the nature of the market for innovation, which has led to better knowledge of the totality of classified regions in terms of inventive activity. Based on the study research the problems of inventive activity in Kazakhstan, such as legal, personnel, financial and informational nature, as well as the registration and examination of innovative developments were identified.

Key words: patent activity, cluster analysis, inventions, utility models, industrial designs, selection achievements, trademarks, innovative development.

At the moment the distinctive feature of functioning of the market of intellectual products is the possession of his subjects high scientific and technical potential, which, in turn, highly dependent on the characteristics of the region.

Currently, relevant strategic objective is the development of domestic high-tech industry, the development and introduction of new high-tech and information technology are aimed at obtaining competitive products and ensure the interests of national economic security through the preservation and development of industrial and scientific-technical potential of the republic.

According to the National Institute of Intellectual Property (NIIP), during the analyzed period 41,511 applications for protective documents for inventions were received. From national inventors by the analyzed period 35686 applications were received, accounting for 86% of their total number, respectively, of foreign inventors — 5825 applications (14%) [1; 16].

The inventive activity in the regional context of the Republic of Kazakhstan was studied (Figure 1).

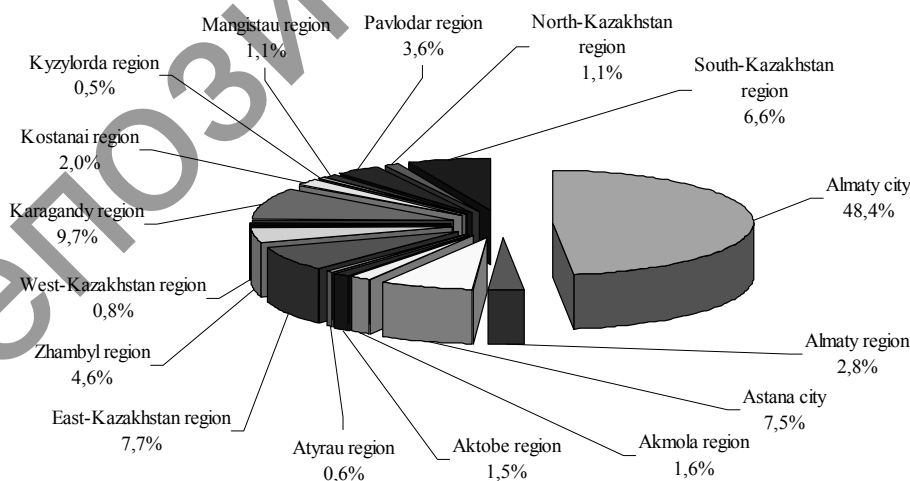


Figure 1. Regional distribution received from national applicants applications for protective documents in the 1992–2015 years, in % (compiled using the data of RSE «NIIP»)

Most inventive activity at the regional level is observed in the city of Almaty. Inventors from Almaty city occupy a large share, so in the period from 1992 to 2015, they filed 17,263 applications (48.4%). After the Almaty inventors followed by the inventors of Karaganda, East-Kazakhstan, South-Kazakhstan regions

and Astana city, whose share is 9.7%, 7.7%, 6.6% and 7.5% respectively. Other regions of Kazakhstan on the level of inventive activity are less than 5% contribution to the innovation market.

The analysis showed that the dominant role in the filing of applications on inventions by foreign applicants belongs to the United States in 2015 (28%), Switzerland (12.9%), France (9.1%) and Germany (6.5%) (Figure 2).

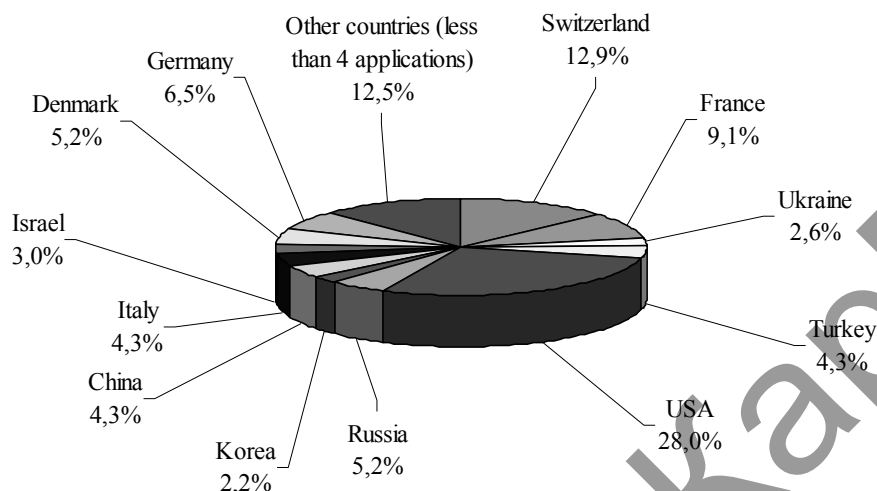


Figure 2. Country distribution the applications for protective documents for inventions are received from foreign applicants in 2015, % (compiled using the data of RSE «NIIP»)

On the other countries, including Russia, Denmark, Italy, China, Turkey, Israel, Ukraine, Korea, less than 5% of the total filing applications are accounted.

In 2015, the largest number of protective documents on inventions, according to the International Patent Classifications (IPC), was issued under the following sections: «Human necessities» (485 patents and innovation patents), «Chemistry and Metallurgy» (371), «Various processes» (191), «Mechanics, illumination, heating» (167), «Construction, mining» (137).

Special place in the analysis of development of the regional market of intellectual property covers the analysis of regional differentiation by the patent activity. For this analysis the method of grouping was used, by means of which the totality of regional entities homogeneous were divided into several groups.

Formations of groups of regions with different rates of patent activity are conducted using cluster analysis.

«Cluster» is a accumulation, a group of elements are characterized by a common property. The basis of this method is based on a set of data describing the objects under the research for a number of grounds. The method is based on a cluster analysis of the natural stratification process laid objects on distinct clusters are disposed apart at a certain distance [2; 45].

Cluster analysis allows solving the following problems of economic-statistical research: to form a homogeneous population, choose the essential features, highlight the typical group. Cluster analysis algorithm is based on calculating the distance matrix. In this article, the ordinary Euclidean distance was used to calculate the distance matrix.

Official statistics does not contain the complete information describing the volume, dynamics and trends of intellectual property development of the regional markets of Kazakhstan. Only the analysis of the available publications on patent activity by region, Republic of Kazakhstan allows classifying regions by the ranking on the mentioned market.

Using the cluster analysis, the classification of the regions of Kazakhstan on innovative activity was conducted [3; 20–21, 4; 65–67]. Multidimensional classification of regions of Kazakhstan was carried out using indicators such as patent activity of market entities in 2015 as the number of issued titles of protection for inventions, utility models, industrial designs, selection achievements and trademarks (Table).

**The distribution by regions the issued by residents the security documents
on the industrial property objects for 2015, units**

№	Region	Number of issued protective documents				
		for the inventions	for the utility models	for the industrial designs	for the selection achievements	for the trademarks
1	Almaty city	639	29	33	21	1011
2	Almaty region	43	1	13	21	123
3	Astana city	183	29	6	-	310
4	Akmola region	23	1	1	14	26
5	Aktobe region	6	2	2	4	57
6	Atyrau region	5	-	1	-	29
7	East-Kazakhstan region	65	11	1	10	60
8	Zhambyl region	61	1	12	-	40
9	West-Kazakhstan region	24	2	4	-	26
10	Karagandy region	91	5	-	-	90
11	Kostanai region	15	6	-	4	50
12	Kyzylorda region	14	-	-	2	11
13	Mangistau region	9	-	-	-	16
14	Pavlodar region	61	1	1	6	29
15	North-Kazakhstan region	21	6	14	1	48
16	South-Kazakhstan region	74	8	6	5	112
Total		1334	102	94	88	2038

Note. Compiled using the data of RSE «NIIP»

16 of the Republic of Kazakhstan regions were selected for analysis in this sample population of Almaty city was excluded, because it is much greater than for the rest of the analyzed indicators.

7 clusters were obtained by multivariate classification (Figure 3):

- the first cluster combined two regions — Almaty and South-Kazakhstan;
- the second cluster is presented by Akmola, Aktobe and North-Kazakhstan regions;
- the third includes 2 areas — the East-Kazakhstan and Pavlodar regions;
- the fourth cluster combined Zhambyl region and West-Kazakhstan;
- the fifth cluster by the level of patent activity is presented by Kostanai region;
- the sixth cluster was made by Atyrau, Kyzylorda, Mangistau and Karaganda regions;
- the seventh cluster is the city of Astana.

Analyzing the resulting classification, it may be noted that the seventh cluster is represented by the city of Astana, is the most powerful.

The first cluster also integrates the regions with a high level of patent activity. Indicators on this cluster regions exceed the corresponding regions of the data got in the second cluster, on average, in 2.72 times, included in the third cluster — in 1.67 times, in the fourth cluster — in 2.41 times, the fifth cluster — in 2.7 cluster and sixth cluster — in 3 times, respectively. This reflects about the tendency of the first cluster of regions to innovative development and, consequently, to an increase an investment attractiveness. Thus, the average volume of issued property documents for trademarks and service marks of the analyzed cluster amounted to 118 units, the number of patents granted for inventions — 59, for utility models — 5, on industrial designs — 10, for selection achievements — 13.

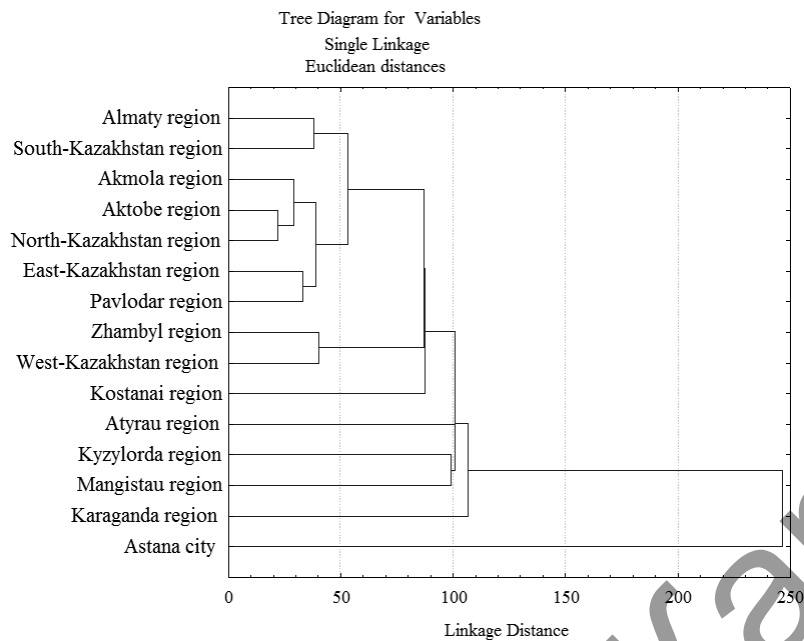


Figure 3. The dendrogram of regions of the Republic of Kazakhstan by the level of innovation activity (compiled using the data of RSE «NIIP» via the package of applied programs Statistica 6.0)

Regions of the second, fourth, fifth and sixth clusters have significantly lower values of these indices, all of these indicating their low activity patent. Like the researches have shown, in these regions the utility models virtually are not invented, and in the future, of course, it will play a negative role and will have a negative impact on their innovative development.

Regions in the third cluster are characterized by an average level of patent activity. Thus, according to research's information, they have the highest rate in the parameter of «the number of issued protective documents for the inventions»: on average, it amounted to 63 units. By one of the criteria for assessing the patent activity of the analyzed regions «the number of issued protective documents for the trademarks» Akmola, Aktobe and North-Kazakhstan region, are included in the second cluster, have average index — 43.7 units.

The cluster analysis allowed solving the following tasks:

- to classify regions of the Republic of Kazakhstan taking into account the features that reflect the essence of the market nature of innovation, which has led to better knowledge of the totality of classified regions by the level inventive activity;
- to build a new classification of regions of the Republic of Kazakhstan on the level of patent activity and to establish relationships within the selected population.

Problems of promotion and development of invention, patent and licensing activities in the regions, there are not in the country the first year.

Unfortunately, only a small part of the inventions in the Republic find its practical implementation. One of the reasons is the lack of government organizations, are involved in the implementation of patented inventions.

In this regard there was a necessity of the expert survey, which revealed the major problems in the implementation of innovations in the economy.

The survey involved a patent attorney of the Republic of Kazakhstan. Respondents noted the most encountered problems of the inventors during the registration of inventions, industrial designs and utility models [5; 363].

According to experts, the main problem is lack of knowledge of legislation in the sphere of the protection documents (83%). They also observe the high rates of registration and support of the protection document (67%); the terms of the application (50%); inability to identify an invention, utility model, as well as the wrong scope (17%).

According to the survey, all experts see the need for a marketing service specialist for the successful commercialization of the research.

Marketing of intellectual industrial property, in their opinion, it is necessary for the study and analysis of the patent situation, checks patents-analogues and the life cycle of intellectual industrial property. At the same time analyzes the supply and demand for similar products are compared all the parameters of the inspected object with the likes given or functioning in the market, predicted the expected demand for new technologies or products, select the type and method of advertising activity, plans are to promote products, selected depth and width of the channels goods movement. The experts noted the need for and specialists from the legal and finance spheres (50 and 33% respectively).

On the question of what are the business intentions of the inventors, the experts noted the following: licensing and the search for investors, patent sales, product sales. As another variant of the answer, the experts drew the attention on the intention of the inventors of a patent for the using of thesis defense — vain desire to be the «inventor».

The most effective elements of infrastructure of supporting the innovation activity, experts consider the targeted program support and development of small businesses, as well as the program of financing of innovative activity. 3 experts have identified the need to create and conduct special training programs in the field of business innovation and the formation of a larger number of venture capital funds. However, they do not consider mandatory elements of an infrastructure of support of innovative activity — technological parks, innovative technology centers, business — centers and small business associations.

The experts were asked at what stage it is advisable to sell innovative business results of scientific activity? Experts, relying on personal professional experience, pointed out that the most advisable to sell the industrial design, as a model of production and technology, driven to industrial applications.

On the issue of the need to increase the number of patent attorneys in Kazakhstan, respondents said that the current number of patent attorneys is sufficient to document the service of inventors, however, need to improve the quality of services provided and their professional competence.

Thus, based on the research, the problems of innovative business in the Republic of Kazakhstan were revealed, which implies the commercialization of intellectual industrial property objects:

- *the registration and examination of innovations*: the ignorance of the inventors of the legislation; high rates of registration and support of protection; long-term consideration of the application; the absence of a search of the electronic database of trademarks and service marks;
- *human resource constraints*: insufficient level of qualification of experts (patent no education); insufficient number of specialists in the field of marketing, management, able to promote innovation in the market; no program of compulsory education heads of enterprises, universities, aimed at the elimination of illiteracy of the patent; the absence of specific services to enterprises on patenting and innovation;
- *financial nature*: insufficient state financing of innovations; high duties on equipment; lack of benefits for income tax; minimum demand for small innovative businesses;
- *information character*: the absence of accurate data on innovative enterprises; lack of information about new domestic and innovative developments.

Many inventions include the narrow scope of the legal protection, enabling other persons legally circumvent a patent, slightly modifying the process parameters or design elements. This is due to the fact that the majority of applicants are no methodological skills submission invention and its preparation of the formula. Not all organizations that create technical innovations, there are competent specialists able to provide methodological assistance in patenting inventions. Problems of training in the field of patents, in line with international standards (lawyers, experts, economists) were exacerbated. It is necessary to address the issue of training of specialists in the field of patents in high schools, with appropriate material and methodological base and qualified teaching staff.

References

- 1 Годовой отчет «Национального института интеллектуальной собственности» Комитета по правам интеллектуальной собственности Министерства юстиции Республики Казахстан / Под ред. С.Е. Бекенова. — Астана: ПТ «Астана», 2015. — 98 с.
- 2 Мандель И.Д. Кластерный анализ. — М.: Финансы и статистика, 1988. — 176 с.
- 3 Шапкина Ж.М., Мамраева Д.Г., Ташенова Л.В. Исследование патентной активности регионов Казахстана // Вестн. Карагандинского ун-та. — Сер. Экономика. — 2015. — № 3 (79). — С. 19–23.
- 4 Мамраева Д.Г., Ташенова Л.В. Изобретательская активность в Казахстане: состояние и проблемы // Менеджмент в России и за рубежом. — 2015. — № 3. — С. 64–69.

5 Мамраева Д.Г. Проблемы коммерциализации изобретений в Казахстане: взгляд экспертов // Внешнеэкономическая деятельность страны в условиях вступления мировой экономики в режим турбулентности: материалы междунар. науч.-практ. конф. (16 окт., 2015 г.). Ч.2 / ЕНУ. — Астана, 2015. — С. 361–366.

Л.В. Ташенова

Қазақстан Республикасындағы патенттік белсенділіктің аймақтық саралануы және негізгі мәселелері

Мақалада кластерлік талдау әдісі арқылы Қазақстан аймақтарының патенттік белсенділігі сараланған. Қазақстан аймақтарының көпөлшемді жіктелуі 2015 жылғы көрсеткіштер: өнертапқыштық нарықтың өнертабысқа берілген қорғаныш құжаттарының саны, пайдалы модельдер, өнеркәсіптік үлгілер, сұрыптау жетістіктері, тауарлық белгілер сияқты патенттік белсенділік өлшемдерімен жүргізілді. Талдау нәтижесінде жеті кластер анықталды. Кластерлі талдау Қазақстан аймақтарын инновация нарығының мәнін, табиғатын ашатын белгілерді есепке ала отырып, өнертапқыштық белсенділік деңгейі бойынша жіктелетін аймақтар жиынтығы бойынша білімді тереңдету әкелді. Зерттеу негізінде Қазақстандағы зерттеушілік әрекеттің негізгі құқықтық, кадрлік, қаржылық және ақпараттық сипаттағы, сонымен бірге инновациялық әзірлемелерді тіркеу мен сараптама кезеңіндегі мәселелер анықталды.

Л.В. Ташенова

Региональная дифференциация и основные проблемы патентной активности в Республике Казахстан

В статье с помощью метода кластерного анализа отражена дифференциация регионов Казахстана по патентной активности. Многомерная классификация регионов Казахстана проведена с использованием таких показателей патентной активности субъектов изобретательского рынка за 2015 г., как количество выданных охранных документов на изобретения, полезные модели, промышленные образцы, селекционные достижения, товарные знаки. В результате анализа получено 7 кластеров. Кластерный анализ позволил классифицировать регионы Казахстана с учетом признаков, отражающих сущность, природу рынка инноваций, что привело к углублению знаний о совокупности классифицируемых регионов по уровню изобретательской активности. На основе исследования выявлены проблемы изобретательской деятельности правового, кадрового, финансового и информационного характера: а также возникающие при регистрации и экспертизе инновационных разработок.

References

- 1 Annual report of the «National Institute of Intellectual Property» Intellectual Property Rights Committee of the Ministry of Justice of the Republic of Kazakhstan, ed. by S.Y. Bekenov, Astana: PT «Astana», 2015, 98 p.
- 2 Mandel I.D. *Cluster analysis*, Moscow: Finance and statistics, 1988, 176 p.
- 3 Shayekina Zh.M., Mamrayeva D.G., Tashenova L.V. *Bull. of Karaganda University*, Series of Economics, 2015, 3 (79), p. 19–23.
- 4 Mamrayeva D.G., Tashenova L.V. *Management in Russia and abroad*, 2015, 3, p. 64–69.
- 5 Mamrayeva D.G. *Foreign economic activities in the country of entry conditions of the world economy in turbulent regime: proceedings of the international. scientific-practical conference (16 October, 2015), Part 2 / ENU, Astana, 2015, p. 361–366.*