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Patenting in Kazakhstan. An empirical study

Abstract

The main problem: The purpose of this article is to perform an empirical analysis of the patenting activity of Kazakhstan, concerning the participation of at least one inventor residing in Kazakhstan and to give information about procedures for Patenting. The empirical research is based on the study of patent office databases and interviews with consulting experts. The analysis showed the prevalence of domestic applicants among the sample. Foreign applicants are represented mostly by business companies. Less than a third of all applications in the sample included a woman inventor. However, the average participation rate of women is close to the average world figure.

Objective: To provide a concrete analysis of the relationship between inventions and patents in Kazakhstan. Furthermore, to offer information about procedures for Patenting and exams the innovative performance in Kazakhstan.

Methods: The study utilized the analysis of existing database on the official websites and some interview with consulting experts in the city of Pavlodar.

Results and their significance: The research outcome is current knowledge of the relationship between research and development and patenting by companies and university research centers.

Keywords: patent, research and development, inventions, investments

Introduction

This study examines the innovative performance of the Republic of Kazakhstan. New technologies are crucial for long-term economic growth. Therefore, development in science and technology determines the competitiveness of a country and its economic development. Development of technological innovations increases the role of research and development (R&D) and intellectual property (IP). Investment in R&D contributes to innovation development and the absorption of external knowledge. Patenting aims to promote innovation in any technological field. Intellectual property rights (IPRs) help to protect innovations and better appropriate economic returns. Countries that want to maintain and increase their competitiveness in the global market must constantly innovate, because knowledge is a cumulative process. Enterprises need a good absorptive capacity to acquire new knowledge and build innovative capabilities to face international competition. Intellectual property rights are important for competitiveness. On the other hand, firms can use public information on patents and other patents and other IPRs to monitor the performance of their competitors and improve their own.

Materials and methods

A patent is a legal title that protects a technical innovation, or a product or process that provides a new solution to a technical problem. It allows those who have made an invention to be able to produce and market it exclusively in the state where the patent has been applied for. Technologies covered by patents are much more defensible in the marketplace. There are different types of patents: their international classification, called IPC (International Patent Classification), is the most widely used system to validate and recognise them. Established following the 1971 Strasbourg Agreement, it is structured in a hierarchical manner and divides patentable technologies into eight sections (A - H), which in turn are distributed into increasingly detailed levels (subsections, classes, subclasses, groups and subgroups). WIPO (World Intellectual Property Organisation) researchers periodically update the IPC classification: since 2006, the eighth version has been in force and contains about 70,000 entries. There is a dedicated OFFICIAL WEBSITE where you can get all the information. The IPC not only

classifies and searches patents, but also publications, scientific articles and technical texts in general, to assess the state of the art in a particular field.

Invention and Patent. The patent is the title that confers on the applicant a temporary monopoly of exploitation of the invented invention, consisting of the exclusive right to make it, dispose of it and make commercial use of it, preventing such activities by unauthorized third parties. The patent is a form of «exchange» between the inventor and the State, involving the public disclosure of the invention by the inventor, in exchange for a series of exclusive rights to what has been declared in the patent application. The State derives a cognitive ‘gain’ from this, in terms of enrichment of the stock of knowledge and further stimulus to the evolution of the state of the art. The subject matter of a patent for industrial invention is any solution in any field of technology that is new, involves an inventive step and is capable of industrial application. The invention is thus considered a solution to a technical problem. It may consist of a new product or a new process. The following are not considered as inventions and therefore cannot be patented as such: discoveries, scientific theories and mathematical methods; plans, principles and methods for intellectual activities, for play or for commercial activity and computer programs; presentations of information. In addition, the following cannot constitute patentable subject matter methods for the surgical or therapeutic treatment of the human or animal body and methods of diagnosis applied to the human or animal body; plant varieties and animal breeds and essentially biological processes for the production of animals or plants, including new plant varieties in respect of which the invention consists exclusively of the genetic modification of another plant variety, even if said modification is the result of a genetic engineering process plant varieties registered in the National Register of Agricultural and Food Biodiversity as well as varieties from which products bearing the marks of protected designation of origin, protected geographical indication or traditional specialty guaranteed and from which traditional agri-food products are derived. The patent application must contain a sufficient and detailed description of the invention, and the level of detail and description must be such as to allow an expert in the field (including the examiner) to understand and replicate the invention.

The complete patent documentation of the invention is made available to the public a few months after the filing date, the secrecy period remaining for this period.

Different protections for each nation. The application for a patent (for an invention or for a utility model) is not mandatory. However, patenting confers on the owner an industrial property right and related exclusive rights and constitutes an intangible asset, with a greater economic value than the absence of a right. To protect what has been conceived and the conditions are met, it is also possible to evaluate the trade secret. It is possible to obtain a patent in all countries that provide for the protection of innovations and therefore almost all over the world. In some countries, however, the concept of a «utility model» does not exist and innovation will still be treated as an invention. In addition, in some countries the patentability of what is not provided for in Europe (such as computer programs or commercial methods) is allowed.

As with trademarks and designs, there is no patent application that can guarantee «worldwide protection»: each country, in fact, provides for separate procedures and specific fees for the submission of the application and for maintaining the grant. Finally, some states have adhered to special agreements so that it is possible to obtain as many registrations as there are countries of interest with a single application.

Patenting, therefore, can take place: at the national level (single State); international (PCT patent application, with subsequent nationalization of the patent in the individual States of interest). Before filing a patent application, it is advisable to check the novelty of the invention created through a patent antecedence search.

The latter is based on the consultation of specialized databases containing patent applications and patents granted, as well as on the verification of any sector publications and market survey.

International Patent. There is an international agreement between 157 countries, according to which it is possible, with a single application for extension and without the use of a legal representative in each state, to obtain as many patents as there are designated countries. This agreement is called the «Patent Cooperation Treaty». Obtaining a patent right means being recognized a title that constitutes an intangible asset, usable, from an economic point of view, both directly and indirectly (e.g. assignment or license agreements). In fact, for the patent not to remain just a title, it is necessary to implement actions to enhance it. It is also important to defend what has been achieved, through periodic checks and surveillance aimed at preventing the unauthorized circulation of products

identical to or like the one covered by the patent. Finally, it should not be forgotten that the validity and duration of the title is not automatic but is closely linked to the payment of life maintenance fees.

Patent procedures. According to the World Intellectual Property Organization (WIPO), a patent is granted by a national patent office of a country or by a regional office that operates for several countries. There are five regional patent offices:

- African Intellectual Property Organization (OAPI);
- African Regional Intellectual Property Organization (ARIPO);
- European Patent Office (EPO);
- Patent Office of the Cooperation Council for the Arab States of the Gulf (GCC Patent Office);
- Eurasian Patent Organization (EAPO).

If an inventor seeks to obtain patent protection in many countries around the world simultaneously, she can file an international application under the Patent Cooperation Treaty (PCT). To obtain patent protection an inventor must file an application. If she applies for a patent in a national patent office only, the patent will be valid only in the country where it is granted. The regional offices make it possible to apply for invention protection in one or more member states of the regional organization. In the patent application, an inventor must provide the title of an invention, the related technical fields and a summary. Also, the inventor must describe the invention in details and clear language as well as its backgrounds (previous patented inventions or scientific literature); such a description is usually accompanied by visual materials such as drawings, plans, or diagrams. The «claims» part of the patent application defines the specific items for which patent protection is sought. Additional supporting documents may be required depending on the patent office. In principle, applicants may prepare and file their patent applications on their own, but most of the time, due to the complexity of patent documents, they resort to the services of patent attorneys.

The PCT procedure. To protect an invention from infringers or imitators in today's global economy, an inventor needs patent protection in the entire world. Every country has its own legal procedures regarding IPRs and the foreign inventors must comply with them. To file a patent application in each country of interest would require a large investment to meet the costs due to filing fees, translation charges and attorney fees. The PCT procedure enables an inventor to file for a single international patent in as many countries as she wishes, provided the countries are signatories to the Patent Cooperation Treaty (Cook 2002).

PCT came into force in 1978. All activities related to PCT are coordinated by WIPO located in Geneva. Nowadays, the PCT has 153 Contracting States. The PCT gives to inventors an alternative route to submitting patent applications simultaneously in the patent offices of all member countries and obtain priority for their inventions, without having to submit separate application in the countries of interest. PCT helps patent offices to make decisions about granting a patent and facilitates access to technical information regarding inventions (Vepachedu 2004). According to «The PCT Applicant's Guide» issued by WIPO (2020), the PCT procedure consists of two main phases: international phase and national phase. It starts with the international phase, which includes filing an international application, international search and international publication. Within 12 months from the date of filing of the first patent application, the inventor can file an international application under the PCT to the national or regional patent office or to the WIPO. This must comply with the PCT formality requirements. The application must be filed in one single language, and the applicant should pay one set of fees (WIPO 2017). The country of origin is defined as the country of the inventor. If in one application there is more than one inventor, the application is divided equally between all of them and subsequently among their countries of residence. Then, the patent application is processed by the «Receiving Office». The second stage involves the establishment of the international search report and written opinion by one of the «International Searching Authorities», which occurs after 16 months from the priority date. The international search is carried out to identify published patent documents and technical literature, which can influence the invention patentability. In the third stage takes place the publication of the international application together with the international search report by the International Bureau of WIPO. After 18 months from the priority date, the content of the international application is disclosed to the world. After 28 months from the priority date, it is provided supplementary international search and international preliminary examination (the additional patentability analysis is usually carried out on an amended version of the application). These stages are optional. The PCT procedure ends with the grant of national or regional patent. This is called the «national phase». The patent granting remains under the control of the national or regional patent

offices. Therefore, after about 30 months from the earliest filing date of initial application, and after paying the national fees an inventor starts to pursue the grant of a patent directly before the national (or regional) Patent Offices (Rockman 2020).

Innovation and Patent Activities in Kazakhstan. The national intellectual property system in Kazakhstan has developed after its independence. In 1992, by the Decree of the President of the Republic of Kazakhstan № 806 «On the National Patent Office under the Cabinet of Ministers of the Republic of Kazakhstan», the national patent office was established. Later it was developed to The Republican State Enterprise «National Institute of Intellectual Property» according to the Resolution of the Government of the Republic of Kazakhstan № 756 in 2002. The National Institute of Intellectual Property (NIIP) takes part in international cooperation in the field of the legal protection of intellectual property. It performs work on international applications under the Patent Cooperation Treaty and the Madrid Agreement. Also, the NIIP performs work within the international cooperation with the WIPO, patent offices of other countries, and other international organizations. IPRs play an important role in protecting inventions. Disclosed information of inventions can promote further technological developments, induce more innovation and technological progress. Innovations lead to the economic development of a country and enable sustainable economic growth. Kazakhstan is a country heavily dependent on natural resources and vulnerable to external shocks. Intellectual properties are a useful tool to foster innovation and to transfer knowledge. It is important to educate business companies about the importance of IP rights and the patenting process. In any technological field, the technical solutions concerned with a product, the method and usage of a known product for a new purpose may be protected as intellectual property. According to the Patent Law of the Republic of Kazakhstan (1999), the «product» may be defined as a device, substance, microorganism strain, plant or animals cell culture. The term «method» refers to «the process of affecting a material object using material resources».

The Patent Law of Kazakhstan emphasizes that the following cannot be recognized as patentable inventions:

- discoveries, scientific theories and mathematical methods;
- methods of organization and management of the economy;
- symbols, schedules, rules;
- rules and methods of performing the mental operations, gaming;
- computer programs and algorithms;
- projects and arrangements for structures, buildings, territories;
- proposals relating solely the exterior appearance of manufactured articles;
- proposals that are contrary to the public interest, the principles of humanity and morality.

Obtain a Patent. A patent certifies the priority, authorship and exclusive right to exploit an invention. A patent for an invention is valid for twenty years from the filing application date. In the case of an invention relating to a medical product or a pesticide (chemical), the period of validity of the exclusive right may be extended at the request of the patent owner, but not more than five years. To obtain a patent for an invention valid in the territory of the Republic of Kazakhstan, an inventor must file a patent application to the NIIP and attach supplementary documents, such as the receipt of payment of the application fee. The application must include names of inventions, applicants and their place of residence or location. Non-residents can also apply for a patent, but only with an attorney who is licensed to practice law. The application must be compiled under the established requirements. The description and drawings of the invention must be presented in a clear and accurate form. They must disclose the invention in sufficient detail to be replicated by others in a relevant field of knowledge. Filed applications are assigned for examination. Examination of patent applications consists of the two stages: formal examination and substantive examination. The formal examination consists of a study of the application for compliance with the legal requirements. The applicant is notified about the result. If the application does not meet the requirements, the applicant is asked to submit corrected or missing documents within the period of three months from the filing date. In case of positive result of the formal examination, the applicant must pay a fee to proceed with the substantive examination within three months since the notification. The substantive examination of the application includes the assessment on patentability, a search for the state of the art, a verification of compliance with the requirement of unity of the invention. If the claimed invention is not patentable, it has a lack of novelty or it differs only in an obvious manner from what is found in the prior art, the claims may be rejected. In the case of rejection, within three months an applicant has the right to file an objection to the Appeal Council. The appeal is considered by the Board of Appeal within four months from the

date of its receipt. If the decision on patentability is favorable, a patent is granted. Within three months from the date of notification about the decision, the applicant must pay the fee for preparing a patent for its issue. Failure to pay the fee on time may result in the cancellation of the application. The payment period may be restored within three months if an applicant pays the fee for restoring the missed deadline. The National Institute of Intellectual Property enters the information into the State Register of inventions, publishes information on the issuance of an electronic bulletin, prepares the patent and sends it to the patent owner by courier or through the postal service. An applicant may draw up amendments (corrections of mistakes without changing the entity of an invention) or withdraw the patent application at any stage of its examination, but before entering the information in the State Register.

R&D activities in Kazakhstan. The relationship between R&D expenditures and patent performance is expressed through research productivity and patent propensity. In other words, an increase in R&D efforts may be translated into more patents in the long run. R&D intensity (gross expenditure on R&D as a percentage of GDP) is the indicator used to compare the resources devoted to science and technology in different countries. According to the UNESCO Institute of Statistics, in 2017 the total amount of R&D expenditure at current PPP prices in Central Asia was almost 1.7 million dollars. The biggest share between the Central Asian countries, 36 % (almost 620 thousand dollars), refers to Kazakhstan. In 2018 the total R&D expenditures in Kazakhstan were roughly twice as much as in Uzbekistan. A possible cause may be the faster economic growth in Kazakhstan in the same time span. According to the National Statistics Committee R&D investments are concentrated in the most developed cities: Almaty and Nur-Sultan (Astana), and They are followed by the Mangystau and East-Kazakhstan regions. In Kazakhstan, as it generally happens, basic research is conducted mainly by public and higher education institutions, while applied research and experimental development by business enterprises. To compare the differences in R&D expenses among fields of science and technology we considered the shares recorded in the business sector. Among the business enterprises sector, the most R&D-intensive field is «Engineering and technology»: in 2018 it accounted for 81 % of total business, the second R&D-intensive field is «Natural sciences», and third the share of «Agricultural and veterinary» sciences. According to the UNESCO Institute of Statistics, in 2018 the number of personnel involved in R&D in Kazakhstan was 22,378 people. The biggest share of R&D staff was involved in the higher education sector (39 %). Personnel related to the Business sector accounted for 36 %, followed by R&D staff working in government (17 %) and private non-profit organizations (8 %). If compared at international level, the number of R&D personnel has to be normalized by the number of people employed. According to the UNESCO Institute of Statistics, in 2017 Kazakhstan and Uzbekistan had a similar level of R&D staff, 2.5 and 2.6 R&D personnel per thousand of total employment respectively. At the same time in the Russian Federation, it was much higher, roughly 4 times more.

Patenting activity in Kazakhstan. Generally domestic applicants tend to file more patents in their home country than non-resident applicants. However, in recent years it was mainly due to a significant decrease in the patent applications from residents. The total number of patent applications is distributed among regions unevenly. About 46 % of all patent applications were filed by applicants from Almaty city. The second inventive region was Nur-Sultan (Astana), the current capital of Kazakhstan. The number of national applications received from Nur-Sultan is much less than from Almaty. This can be explained by the fact that Almaty has long been the Kazakhstan's most developed city: it has been a financial, economic and science hub. Besides the Kazakhstan's main cities, the highest number of patent applications are obtained from three regions: Karagandy region, East Kazakhstan region and South Kazakhstan region. It should be noted that these areas are also the most populated. To assess the patent intensity of the regions, the number of patent applications has been normalized by the number of resident people.

The calculations has been done based on the data from the Statistics Committee of Kazakhstan. Thus, in terms of patent intensity the most innovative areas were Almaty, Nur-Sultan, and three more industrialized regions: Karagandy, Pavlodar and East Kazakhstan region. The bulk of R&D investments are concentrated in Almaty and Nur-Sultan, because they are the most developed cities, as well as East Kazakhstan region, the largest metallurgical center of Kazakhstan. At the East Kazakhstan region, Almaty city and the Pavlodar region have the highest level of innovative capacity.

Discussion

A patent is a legal title that protects a technical innovation, or a product or process that provides a new solution to a technical problem. It allows those who have made an invention to be able

to produce and market it exclusively in the state where the patent has been applied for. Technologies covered by patents are much more defensible in the marketplace. Countries that want to maintain and increase their competitiveness in the global market must constantly innovate, because knowledge is a cumulative process. Enterprises need a good absorptive capacity to acquire new knowledge and build innovative capabilities to face international competition.

Conclusion

Intellectual property rights play an important role in protecting inventions. Disclosure of information about inventions can encourage further technological development, more innovation and technological progress. Innovation leads to a country's economic development and enables sustainable economic growth. Kazakhstan is a country heavily dependent on natural resources and vulnerable to external shocks. Therefore, Kazakhstan is trying to diversify its economy and achieve sustainable growth through industrial and innovative development. However, the country does not perform well in terms of innovation activity. Kazakhstan's R&D expenditure is critically low compared to other countries. Most of the R&D has been carried out by universities and the public sector, which indicates a low motivation of business enterprises to carry out R&D. As a result, the results of R&D often have no practical application. The number of Kazakh female inventors involved in international patenting activities is low, although it has improved over time. The ratio of female to male inventors in Kazakhstan was 1/5. Less than a third of all international applications included at least one female inventor. The under-representation of women in patenting activity can be explained by the role of women in society, where family and childcare take priority. Intellectual property is a useful tool for promoting innovation and transferring knowledge. It is important to educate businesses about the importance of IP rights and the patenting process. Cooperation between local researchers and the international scientific community would be beneficial for the development of innovation. In addition, the involvement of more female researchers in innovative activities can help increase IP output in Kazakhstan. The role of the government in all of the above is crucial.

СПИСОК ИСПОЛЬЗОВАННЫХ ИСТОЧНИКОВ

- 1 Caputo P. Business and Management - Classroom in a Book. Vesuvian Academy Publishing, 2024.
- 2 Abdymanapov, S., Toxanova, A., Galiyeva, A., Muhamedzhanova, A., Ashikbayeva, Zh. & Baidalinova, A. (2016). Government Support of Innovative. Business in the Republic of Kazakhstan. International Electronic Journal of Mathematics Education 11(5), 1033-1049.

REFERENCES

- 1 Caputo P. (2024). Business and Management - Classroom in a Book. Vesuvian Academy Publishing. [in English].
- 2 Abdymanapov, S., Toxanova, A., Galiyeva, A., Muhamedzhanova, A., Ashikbayeva, Zh. & Baidalinova, A. (2016). Government Support of Innovative. Business in the Republic of Kazakhstan. International Electronic Journal of Mathematics Education [in English].

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Қазақстан Республикасында патенттеу. Эмпирикалық зерттеулер

Осы баптың мақсаты Қазақстанда тұратын кем дегенде бір өнертапқыштың қатысуына қатысты Қазақстанның патенттік қызметіне эмпирикалық талдау жүргізу және патенттеу рәсімдері туралы ақпарат беру болып табылады. Эмпирикалық зерттеу патенттік ведомстволардың деректер базасын зерделеу және сарапшы-консультанттармен әңгімелесу негізінде жүргізіледі. Талдау отандық үміткерлердің іріктеме арасында басым екенін көрсетті. Шетелдік өтініш берушілер негізінен коммерциялық компаниялар болып табылады. Үлгідегі барлық өтінімдердің үштен бірінен азы әйел ііонертапқышты қамтыды. Алайда, әйелдердің орташа қатысу деңгейі әлемдік орташа деңгейге жақын.

Қазақстандағы өнертабыстар мен патенттер арасындағы өзара байланысқа нақты талдау жасауды қамтамасыз ету. Бұдан басқа, Қазақстанда инновациялық қызметті патенттеу және сараптау рәсімдері туралы ақпарат ұсынылсын.

Зерттеу барысында ресми сайттардағы қолда бар деректер базасын талдау және Павлодар қаласы бойынша сарапшы-консультанттармен әңгімелесу пайдаланылды.

Зерттеу нәтижесі – компаниялар мен университеттердің ғылыми орталықтарының ғылыми-зерттеу және патенттеу арасындағы өзара байланыс туралы ағымдағы білімі.

Түйінді сөздер: патенттік, ғылыми-зерттеу және тәжірибелік-конструкторлық әзірлемелер, өнертабыстар, инвестициялар

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Патентование в Казахстане. Эмпирическое исследование

Целью данной статьи является проведение эмпирического анализа патентной деятельности Казахстана в отношении участия хотя бы одного изобретателя, проживающего в Казахстане, и предоставление информации о процедурах патентования. Эмпирическое исследование основано на изучении баз данных патентных ведомств и интервью с экспертами-консультантами. Проведенный анализ показал преобладание отечественных абитуриентов среди выборки. Иностранные заявители представлены в основном коммерческими компаниями. Менее трети всех заявок в выборке включали женщину-изобретателя. Тем не менее, средний уровень участия женщин близок к среднемировому показателю.

Необходимо произвести конкретный анализ взаимосвязи между изобретениями и патентами в Казахстане. Кроме того, предоставить информацию о процедурах патентования и экспертизы инновационной деятельности в Казахстане.

В исследовании использовался анализ существующей базы данных на официальных сайтах и интервью с экспертами-консультантами в городе Павлодар.

Результатом исследования являются современные знания о взаимосвязи между исследованиями и разработками и патентованием компаниями и университетскими исследовательскими центрами.

Ключевые слова: патент, исследования и разработки, изобретения, инвестиции.

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