

SPIN-OFF COMPANIES AND THEIR ROLE IN KNOWLEDGE-BASED ECONOMY

*Lidia MAIER¹, scientific researcher,
National Institute for Economic Research
Iulita BIRCA², scientific researcher,
National Institute for Economic Research*

In the Republic of Moldova, the term of “spin-off” is little known, and research of the phenomenon, the possibilities for creating “spin-off” enterprises and the benefits they bring have not been achieved. The actuality of the theme is related to the need to create different groups of SMEs, given the importance that they have in the economy and the creation of new innovative enterprises (spin-offs) due to the implementation and marketing of knowledge products through the development of innovation activities and technology transfer and cooperation between SMEs and research institutions/universities. The purpose of this article is to show what companies are of “spin-off” type, the context in which there was necessary for creating them, their interaction with research organizations/universities, possible barriers to create such companies and the benefits of their creation. The following methods have been used in this article: analysis and generalization of literature, analytical materials, legislation creating innovative business abroad. As a result, it was found that “spin-off” companies are a new business model and one of the most effective and meaningful mechanisms to transfer and direct marketing knowledge from universities and public research institutions, or large companies with scientific activity. They are small businesses based on innovations and new technologies whose intellectual capital originates from organizations with scientific activity. These companies are designed to contribute to innovation, growth and jobs at local and national level and revenue generation. They are flexible and dynamic, they have great potential for growth, giving rise to fields and markets, and playing a key role in the development of high-tech clusters. There have been also drafted recommendations to facilitate the process of creating “spin-off” companies in Moldova by scientific/academic staff.

Key words: *economy, innovation, research, enterprise, SME, spin-off.*

În Republica Moldova, termenul de „spin-off” este puțin cunoscut, iar cercetarea fenomenului, a posibilităților de creare a întreprinderilor de tipul „spin-off” și a beneficiilor aduse de acestea nu s-a realizat până acum. Actualitatea temei respective ține de necesitatea creării diferitor grupe de IMM-uri, datorită importanței pe care o au acestea în economie și de crearea unor noi întreprinderi inovative (spin-off-uri) în rezultatul implementării și comercializării produselor de cunoaștere prin dezvoltarea activităților de inovare și transfer tehnologic și a cooperării dintre IMM-uri și instituțiile de cercetare/universități. Scopul prezentului articol este de a stabili ce întreprinderi se raportează la întreprinderile de tipul „spin-off”, contextul în care a apărut necesitatea de creare a acestora, interacțiunea dintre acestea și organizațiile de cercetare/universități, posibilele bariere în calea creării unor asemenea întreprinderi, dar și beneficiile aduse de crearea lor. Metodele folosite la elaborarea articolului au fost: analiza și generalizarea literaturii de specialitate, a materialelor analitice, actelor legislative de creare a afacerilor inovative în străinătate. În rezultat, s-a constatat că întreprinderile de tipul „spin-off” sunt un nou model de afaceri și unul dintre cel mai eficient și mai semnificativ mecanism de transfer și comercializare directă a cunoștințelor din universități și instituțiile de cercetare publice sau din marile companii cu activitate științifică. Ele sunt întreprinderi mici bazate pe inovații și noi tehnologii, al căror capital intelectual are originea în organizații cu activitate științifică. Aceste întreprinderi sunt concepute pentru a contribui la inovare, creștere economică și locuri de muncă la nivel local și național și generare de venituri. Ele sunt flexibile și dinamice, dispun de un mare potențial de creștere, dând naștere la domenii și piețe noi, și jucând un rol esențial în dezvoltarea de clustere de înaltă tehnologie. De asemenea, au fost elaborate recomandări pentru a facilita procesul de creare a întreprinderilor de tipul „spin-off” în Republica Moldova de către personalul științific/universitar.

Cuvinte-cheie: *economie, inovație, cercetare, dezvoltare economică, întreprindere, IMM, spin-off.*

¹ © Lidia MAIER, heart1961@mail.ru

² © Iulita BIRCA, bircaulita@mail.ru

В Республике Молдова термин «спин-офф» малоизвестен, а исследования этого явления, возможностей создания предприятий типа «спин-офф» и их преимущества до сих пор не были реализованы. Актуальность этой тематики связана с необходимостью создания различных групп малых и средних предприятий, учитывая их важность и роль в экономике и создания новых инновационных предприятий («спин-офф») в результате внедрения и коммерциализации наукоемких продуктов, развития деятельности в сфере инноваций и трансфера технологий и сотрудничества между МСП и научно-исследовательскими учреждениями/университетами. Цель статьи - показать какие предприятия относятся к «спин-офф», контекст, в котором возникает необходимость их создания, взаимодействие между ними и научно-исследовательскими организациями/университетами, возможные барьеры в создании таких предприятий, а также их преимущества. Для разработки статьи были использованы такие методы как анализ и обобщение специализированной литературы, аналитических материалов, законодательства о создании инновационного бизнеса за рубежом. В результате установлено, что предприятия типа «спин-офф» являются новой бизнес-моделей и одной из самых эффективных и значимых механизмов трансфера технологий и прямой коммерциализации знаний государственных научно-исследовательских институтов и университетов или крупных компаний, вовлеченных в научно-исследовательской деятельности. Они являются малыми предприятиями, основанных на инновациях и новых технологиях, интеллектуальный капитал которых происходит из организаций с научной деятельностью. Эти предприятия призваны содействовать инновациям, экономическому росту и созданию рабочих мест на местном и национальном уровне при генерации доходов. Они являются гибкими и динамичными, имеют большой потенциал роста, что приводит к появлению новых отраслей и новых рынков, и играют ключевую роль в развитии высокотехнологичных кластеров. Также, были разработаны рекомендации для продвижения процесса создания предприятий типа «спин-офф» в Молдове научно-исследовательским персоналом.

Ключевые слова: экономика, инновации, исследования, предприятия, малого и среднего бизнеса, спин-офф.

JEL Classification: G0; O3; O31; I2; M2; F63; P31; P42.

Introduction. Currently, in the economy, there are two major trends in the development of SMEs: 1) creation of different groups of SMEs, given the importance that they have in the economy and 2) the creation of new innovative enterprises due to the implementation and marketing of the knowledge products through disseminating innovation and technology transfer activities and cooperation between SMEs and research institutions/universities.

These two trends are promoted simultaneously, because increasing the number of reliable companies capable of creating quality jobs, ensuring high productivity and competitive export-oriented cannot be ensured without the development and continued support of science, the development of innovation and technology transfer activities, providing knowledge marketing and implementation. The transfer, marketing and implementation of knowledge products contribute to enhancing the competitiveness of SMEs, in particular, and to the development of the knowledge economy in general.

Knowledge-based economy is a new concept, new approach to the economy that will help the country to evolve rapidly and overtake the developed nations. This new economy is a gateway which US economist Joseph E. Stiglitz, Nobel Economics Laureate in 2001, considers as having “a greater chance for a democratic and sustained economic growth, which will bring in future prosperity and social justice”.

Knowledge-based economy is the only mechanism for rapid economic growth. In XXI century society, value is not represented by tangible goods but by intangible ones, such as human capital, knowledge, intellectual property etc. Investments in human capital, in education, in research and development are accompanied by positive effects.

The development of the knowledge-based economy is forcing government authorities to support a series of measures to create and develop SMEs and the dissemination and commercialization of research results and technology transfer in different regions of the country, identifying relevant technologies relevant for the development directions of the respective regions and establishing connections of SMEs with the research environment and large companies from the field of research and innovation. Among these measures are named the creation of innovation and technology transfer centers, scientific-technological parks, innovation incubators, innovation clusters etc., which could facilitate SMEs'

access to knowledge and new technologies, for which it is performed most often with difficulty. Also, these measures include a series of programs that have given rise in recent years, to a number of projects designed to stimulate entrepreneurial development, increasing SMEs competitiveness through research, innovation, technology transfer, and to facilitate the development of new business models. Programs that are directly related to the increasing number of SMEs and marketing of knowledge-based products are based on promoting and fostering technology transfer [11]. In the technology transfer process, in order to capitalize the results of the research, an important role is given to research institutions and universities that are moving from their traditional roles of research, teaching and dissemination of knowledge to playing a more advanced role in the creation of “spin-offs” and promoting the academic entrepreneurship [15].

In the Republic of Moldova, the notion of “spin-off” is little known, and the researches of the phenomenon and possibilities for creating “spin-off” enterprises and their benefits have not been achieved yet. The purpose of this article is to show how companies are related to the “spin-off” concept, the context in which it was necessary for creating them, their interaction with the research organizations/universities, possible barriers to create such companies and the benefits of their creation.

“Spin-off” does not have a uniform definition [16], [14], but all the definitions found in the literature converge on common characteristics: the parent organization of the “spin-off” is an organization with research/academic activity; “spin-off” is an entity legally separated and is not an extension of the public research institution; “spin-off” must exploit the knowledge derived from scientific/academic activities; the “spin-off” activity must aim at generating profit and commercialization of technology.

In other words, “spin-off” companies are innovative enterprises created by “detachment” from a larger entity, for example, a new company created by a scientist or group of scientists from research institutions / universities or from a company with scientific activity. This is one of the most interesting and challenging instruments of technology transfer: *the transfer of people with ideas for products/services from universities or research organizations, but not a transfer to an organization or enterprise that already exists and functions* [17]. This organization must be established simultaneously with the development and implementation of the idea. “Detachment” from the public or private research institution is done in order to continue in the newly created company of the researched solutions till their completion, in order to produce and market the outcomes.

So, if the previous academic and entrepreneurship activity is considered to be incompatible, in present it appears that in many cases they go (must go) hand in hand. In particular, scientists and university teaching staff do not need to sacrifice academic freedom for the opportunity to bring their achievements on the market. Moreover, many successful entrepreneurs and academics from abroad show that it is possible to be part of academia while marketing the scientific achievements.

It’s worth noting that “spin-off” companies are created not only within public research programs, they are also created within many large companies with scientific activity. Referring to the “spin-offs” it should be mentioned that “separation” from private company is a strategy and it takes place when:

- The parent company feels the need to divide the produced products;
- The need to “translate” into practice the ideas/new (revolutionary) technologies – either because their result to be taken and implemented in the work of the parent company or to be placed on the market.

In both cases the advantages of this strategy are:

- 1) Flexibility and rapid reaction to the constantly changing demand and market trends. Large companies cannot react and cannot quickly adapt to fluctuating demand and contextual developments as opposed to “spin-offs”. In the case of revolutionary innovations, initially, there are needed some unusual approaches both to decisions making process, and to the style of the team: no days off, no limits of the working day, the total gift of self;
- 2) High motivation of company’s employees, increase of the responsibility. Large companies encourage some experts and some teams involved in research not only allowing them to set up businesses such as “spin-off”, but offering them money for the rapid development of innovative ideas;
- 3) Greater opportunities for interaction with the innovation infrastructure agencies, the scientific community and the sphere of production;
- 4) Reducing expenditures for development, implementation, marketing and technology transfer from the account of specialization, reducing administration and trading costs.

The context of the necessity of “spin-offs” creation. Under the conditions where the competitiveness of enterprises began to depend largely on their degree of innovation, the role of science intensified and relations between business and research have become increasingly noticeable, being subject to fundamental changes caused both by globalization and other factors that converge to accelerate the development of the knowledge market. The most visible changes are the emergence of expanded partnerships between research institutions/universities and businesses and the development of activities in the field of transfer, implementation and commercialization of science results in the socio-economic environment. Both partnerships and technology transfer activities were determined due to lower budgetary resources allocated to research, which in result led to turn research institutions and universities to seek new sources of funding for keeping their researchers / teachers and which now is a natural and legitimate way [20].

However, the large number of existing patents, large stocks of untapped knowledge and changing the development paradigm for innovation led developed countries to seek and create institutional and organizational advantageous conditions for innovation and technology transfer, making them a problematic issue for science and technology policy. The result proved that certain small innovative enterprises (spin-offs) can be the lever that “bind” together science and industry and have the highest potential for growth. They initially assume the risk of transformation of ideas into prototypes, without which it is impossible to evaluate its market perspectives and if is generally appropriate for the market. Namely because of this, large enterprises do not do major investment in innovation because they require at least some guarantee of success [23].

In European countries, the Lisbon Strategy which perceives innovation as an engine for economic change, and the strategy “Europe 2020” provide that each country must consider all possible types of mechanisms and structures for technology transfer to promote the use of research with public funding and maximize the socio-economic impact. The European Commission urged Member States [18] to develop and disseminate “*policy of creating “spin-offs”, allowing staff of the public research organizations to engage, if necessary, in the creation of such enterprises – and to encourage in this purpose – to establish clear long-term relations between “spin-offs” and public organization*”.

Another context that favored the necessity of creating a “spin-off” business was the fact that research institutions in their innovative approach have encountered many problems:

- 1) for the transfer and assimilation of knowledge products in the economy, has proven that large financial resources are needed and also more time for gaining profit;
- 2) businesses, wanting immediate gains, but lacking of financial resources, proved to be uninterested in taking new knowledge and technology from the academic environment; and more,
- 3) scientific institutions were not able to react quickly and flexibly to business needs and develop unique innovations and other innovations standardized on request.

These three main reasons determined the weak cooperation among the academic and private sector and the need for the creation of innovative small businesses by researchers, teachers, PhD and master students etc. [22].

Additionally, research institutions and universities, understood, that in order to achieve a genuine economic progress, must themselves “feed the economic engine” cooperating extensively with business and contributing to the development of academic entrepreneurship. Academic entrepreneurship is one of the ways to transfer the results of academic/university research in the enterprise’s activity and produce economic and social value for both external stakeholders and members of academia and in which at least one member of academia, maintains the main role [2]. A report published by the Council of European Francophone Rectors (CEFR), expresses clear and unequivocal the point of view of academic authorities about the phenomenon: *Since businesses are defined as the “engine” of the economy, academic/university research must be one of “its fuels” [20].*

In addition, it should be mentioned the context of the development of personal will of scientists to create innovative enterprises, including the need to increase material wealth and “instinct of the creator” (“*desire to participate in the further development of its implementation, to be proud of its usefulness for the country and the world*” [25]).

The first “spin-off” companies appeared in the US, the cradle of university entrepreneurship, being promoted in the Silicon Valley and Route 128 next to prestigious universities Stanford and Massachusetts

Institute of Technology, and being a part of the university American landscape till nowadays. In Europe, research institutions and universities just recently realized the proactive role of “spin-offs” in the economic development of the regions where they are located and decided to develop and disseminate a policy on the creation of “spin-offs” and now they are the most common mechanism for technology transfer and commercialization of innovation.

It is worth mentioning also that the American concept of “spin-off” differs from European concept. For instance, in the American approach, a “spin-off” is an entity created by members of the academic community for knowledge transfer and commercialization, which is *an element of intellectual property* created in the parent academic institution. While in the European approach, the concept of “spin-off” is understood as any involvement of academic institutions/universities, their employees, doctoral students in the business and creation of all kinds of businesses (*not necessarily using intellectual property*). The differences between European and American approaches result in a lower level of entrepreneurship in Europe and the need to support the development of entrepreneurial spirit and skills among European population [9].

Steps for setting up “spin-off” enterprises. “Spin-offs” are usually created at the initiative of university researchers and teachers to achieve technology transfer from research institutions to enterprises and to ensure the development of new areas of business and innovation activities. “Spin-off” projects provide a researcher or group of researchers the possibility to be “away” from public or private institution, where there was developed a research project and obtained results, in order to continue the researched solution till its completion, for the production and realization of the outcomes on the market. These activities are economic in nature, as they consist of production and the marketing of products and services.

The most important steps in creating “spin-off” enterprises [24] are:

1. *Evaluation of the potential market.* At this stage it is very important to know which will be the product/service manufactured/provided by the “spin-off”, who will be consumers and market and what is the situation on the market regarding this expected product/service (are there any similar products on market, prices, which is the level of demand etc.). Knowing as many details about the potential market, there could be developed business plans, including plans for information, advertising actions and positioning of the product/service on the market.
2. *Creation of the team.* When creating a “spin-off” enterprise the human factor is decisive and the properly formed team provides virtually 90% of the company’s success. It is well known that during the emergence and development of the idea of innovative product/service, the leading role belongs to scientist/researcher. In the preparation phase of transformation, the ideas into products/service and its entrance on the market, the main role belongs to those able to manage business processes, to conduct negotiations with investors, partners etc. Scientists do not always possess such qualities, so only in rare cases the project manager can be also the general manager of the company. Experience shows that investor invests rather in a team than technology, because even the best and most promising idea can be “destroyed” by an incompetent team, and vice versa – a good team is able to successfully commercialize an idea that is not too promising.
3. *Selection of founders.* Not all team members can become founders of the company, while not all founders actively participate in the marketing of scientific achievements. Typically, one of the founders of “spin-off” is the research institution/university or private company with scientific activity, because here goes about commercialization of intellectual property created within it. Also, the founders may be the employees of research institutions/universities or private companies – authors of the idea, as well as other persons who actively participate in promotion. If in the process of creation of a company an investor appears ready to invest in business development, it also can be among the founders. In addition, each founder may hold different levels of participation, depending on the amount invested and participation in the “spin-off”.
4. *Development of a business plan.* The business plan is the basis for investment decisions, so it must be carefully prepared and includes the project summary, the organizational plan, marketing plan, production plan, and financial plan.
5. *Making contracts with the organization of research/university.* The final stage is the negotiation with the public research institution or a private company with scientific activity (institution/parent company) and the conclusion of lease contracts (premises, equipment etc.) and services (financial, accounting, human resources, promotion etc.) [21].

Attracting investments in “spin-off” enterprises. The initial capital for the creation of the enterprise is made of the own savings of the team and non-refundable state grants. For example, in Russia there are state grants supporting programs to create small businesses through the innovative sphere through the Assistance Fund of development of small enterprises in the technical and scientific sphere [27] as well as regional government programs.

Although in some countries public research institutions participate partially in the financing of the creation of businesses (usually around 25% of statutory capital in case of holding of own funds), there is not possible to count on them for the purposes of investment as they are non-profit organizations and do not have the means to financially support the “spin-offs”. In a document of the University of Iowa (USA) “Policy on Accepting Equity” it is directly stated that the university does not prefer to invest in created companies, focusing on other forms of support (rights to exploit intellectual property for the use of machines and premises, indication of the public institution as the main beneficiary, use of the logo and other symbols etc.). However, in exchange for financial contribution to the establishment of “spin-off”, the parent institution can receive a share of profit. However, the financial contribution may not come from resources allocated to research directly or indirectly by the state, if only there are conditions in which there are used instruments dedicated to the support of “spin-offs” within technological and innovation incubators or science and technology parks.

In many cases, understanding the importance of financial investments for creation and development of “spin-off” companies, near the public research institutions there are created venture funds to attract professional venture companies, and sometimes, even the state.

Also, in “spin-off” companies, foreign investors may also invest, such as business angels or corporate investors interested in developing “spin-off” in their own interest, in exchange for equity shares in the share capital of the company.

Periodically, the “spin-off” must present the participants and the founders a progress report, economic and financial documents, as well as plannings for the next year. Annually, the parent institution’s management should perform an assessment on its participation in the “spin-off” [13].

Some obstacles which hinder the creation and development of “spin-off” companies. While “spin-off” companies prove to be an effective tool to increase the number of SMEs and to implement and market the knowledge, there are some obstacles to their creation and development [8]. First, entrepreneurs from academia must possess a rare blend of skills – traditional skills of scientists, including inner forces, rigor and technical skills and traditional skills of businessmen, including the ability to recognize business opportunities and create value for consumers, and the ability to assume risks. The effectively combination of these qualities and skills is important to the success of “spin-off”, *but is not always a feature of the academic environment.*

Secondly, *the academic and university culture itself is a serious obstacle* in the way of academic entrepreneurship and “spin-off” business development. In many countries, traditional science education does not include entrepreneurship. At the same time, it believes that doctoral and postdoctoral studies should focus entirely on research and in no case on entrepreneurship. Thus, even in an environment favorable to entrepreneurship academic challenges of making a person become both a world-class researcher and one that sells its own achievements are seen as incompatible.

However, *lack of entrepreneurial component in university education and lack of entrepreneurial skills in academics*, in many cases, is perceived as a problem, at least as regards to their practical experience in entrepreneurship [23]. Although most countries report that teachers and researchers are offered some training in entrepreneurship, is urgently needed an improvement, and a systemic approach in this area.

Other barriers may be considered: *weak methodical and informational support; insufficient funds and shortage of skilled human resources; lack of infrastructure for innovation or an imperfect, poorly functioning innovation infrastructure; high economic risk.* In addition, in some countries there are legal impediments that do not allow academic staff to participate to scientific and business creation and development of commercial activities.

The benefits of creating “spin-off” enterprises for organizations with scientific activity and regions. In recent years, civil servants from ministries, academic institutions and universities from all countries are extremely interested in promoting the creation of “spin-offs” which are based on published research as “spin-offs”:

- Exploit the intellectual property of universities and other public and private research organizations;
- Increase the effectiveness of public funds use, aimed at developing innovations;

- Provides an inexpensive and non-confrontational channel for technology transfer and commercialization of research results of science in production;
- Improve the financial situation of research institutions/universities and private companies involved in scientific activities;
- Halt the brain drain abroad.

These companies are designed to contribute to innovation, growth, employment (job quality) and income generation. They are perceived to be flexible and dynamic, giving rise to new areas and markets and playing an essential role in the development of high technology clusters [1]. Businesses such as “spin-off” have a multiplier effect in the diffusion of knowledge and technology, including hastening of the speed of implementation of research results. They have a strong positive influence on local economic development; encouraging entrepreneurial behavior among researchers and inventors involved in the marketing of research results; they are also a more profitable trading form than licensing; they reduce development, transfer and commercialization costs of technology [12], [25].

General policy framework for supporting the creation of academic/university “spin-offs” in the main European countries, including Russia. The attention paid in recent years to become more competitive economy, to SMEs and entrepreneurship has created an environment to develop the spirit, culture and entrepreneurial skills, including through a better exploitation of basic science and technology, and to facilitate the actions of the players involved (universities, research institutions, schools of engineering and entrepreneurship, enterprises with scientific activity etc.). Public authorities, aware of the need to increase scientific and technological performance, sought to develop policies and introduce mechanisms that would create favorable conditions for the emergence of an environment conducive to innovation and technology transfer and the development of the knowledge-based economy. First, laws were passed that allowed to lift legal restrictions that previously prevented research/university staff to participate in creating a business, develop and commercialize their accomplishments or provide business expertise. These laws allowed the research staff to temporarily leave the public service in order to participate in creating a business that will develop their idea or its realization for a certain period. They also allowed the researchers to provide scientific support for a business, to hold a shareholding in the capital of innovative companies and to be a member of the management board, while continuing to be a public servant.

Secondly, in order to develop research results in their fields of activity and to strengthen relations between science and industry, research institutions/universities began to create structures that support the creation and development of small and medium-tech enterprises, such as technology transfer offices, innovation centers, scientific and technological parks and innovation incubators to host innovative companies and support their development. These structures promote the dissemination of innovation, creating premises, providing equipment, materials, knowledge, know-how and public research to businesses and individuals.

Third, there was introduced a tax framework favorable for innovative firms and a legal framework adapted to the situation of innovative companies, as it turned out, that the existing framework was inappropriate for young businesses with high risk and high growth potential, in which researchers develop their findings.

For example, appeared the law on innovation and research **in France**, adopted on 12 July 1999, the main aim of which was to transfer knowledge, publicly funded by industry and “*promoting the creation of innovative technological enterprises*” [10]. This law allowed researchers, teachers and students to participate in the creation, reconciliation and management of innovative companies and to participate in the capital of created companies [7]. Researchers can start a “spin-off” business without losing the status of public servants, they can return to their entity in case of failure or participate in creating enterprise without leaving the laboratory working [6].

In Germany the creation of innovative enterprises such as “spin-off” was promoted especially since the end of 1998 through the EXIST Programme (competition for new business creation by the scientific community) as a part of the “High-Tech Strategy for Germany” and funded by the German Ministry of Education and Research (BMBF) with the support of European funds [5]. In Germany researchers have the right to open a “spin-off” business and return to scientific work at any time in case of failure.

In the same year, 1998, the **UK** government published the White Paper on competitiveness (“Our Competitive Future: Building the Knowledge Driven Economy”, DTI, 1998) [19], which highlighted role of authorities, research and business in improving the competitiveness, and in 2000 – the White Paper on

research and technology transfer (“Science and Innovation: Excellence and Opportunity”) [3], which highlighted the crucial role of authorities in encouraging the exploitation of knowledge and new technologies. There were also promoted a series of government programs to support and encourage the creation of “spin-offs”, which can be grouped into six main chapters: Status researchers, intellectual property, entrepreneurship training, competitions, innovation incubators and initial capital.

In **Italy**, in order to strengthen competitiveness of “*technological industries and to increase the share of innovative production and employment of highly qualified work force*” by Legislative Decree no. 297 of 27 July 1999 [4] researchers from academia and teachers university were allowed to “fall off” from public institutions to create “spin-offs” and the White Paper of the Ministry of Industry from November 2000 defines the mobilization of financial resources for technological companies created by scientific research. The researcher is entitled to leave its laboratory for a period of four years without losing the status, then having the chance to return and continue its activity.

Later in 2009, the Federal Law № 217-ФЗ was adopted in **Russia**, which allowed research institutions and universities to create small companies for practical application of the results of intellectual activity. The purpose of this law is not only to create innovative small enterprises, but enterprises that would produce competitive products and generate profit. The law provides the ability to attract third party as founders of “spin-off”, with the condition that the share of participation of the scientific institution in the capital of J.S.C. will be over 25% and of the LLC – over 33% [26].

Conclusions and recommendations. “Spin-off” businesses are a new business model and one of the most effective and most significant trading mechanisms and direct transfer of knowledge from universities and public research institutions, or large companies with scientific activity. They are small businesses based on innovations and new technologies whose intellectual capital originates from organizations with scientific activity. These undertakings are designed to contribute to innovation, growth and jobs at the local and national levels. They are flexible and dynamic, have great potential for growth, giving rise to fields and markets, and playing a key role in the development of high-tech clusters.

Having an important place in the innovation process, promoting the creation of “spin-off” enterprises must be part of a set of policies which favor an entrepreneurial climate and encourage networking between universities, industry and public sector. Policy objectives, aimed at creating “spin-off” enterprises by scientific/scholarly staff should include:

- Creation of favorable conditions for the emergence of an environment conducive to innovation and technology transfer and the development of the knowledge economy;
- Improvement of the mechanisms for transfer of knowledge between science and industry by promoting “spin-off” strategies that serve as facilitators of effective links between innovation infrastructure agencies, the scientific community and the sphere of production;
- Adoption of an appropriate legal and regulatory framework to stimulate individual researchers and research organizations financed from public funds to establish new “spin-off” businesses. In this regard, it is easier for the governments to take the political decision to support the creation of “spin-offs” than to promote collaboration research and development with companies, as “spin-off” strategies allow a better control over the results of research projects publicly funded at the academic level;
- The adoption of laws that would allow to lift legal restrictions for research/university staff to participate in creating a business and develop and commercialize achievements, to participate in the capital of innovative companies and to be a member of council management, while continuing to be a public servant;
- Provision of infrastructure to support the creation and development of technologically advanced small and medium enterprises, such as technology transfer offices, innovation centers, scientific and technological parks and innovation incubators to host innovative companies and support their development;
- Providing financial support for the creation and development of “spin-offs”;
- Introduction of a favorable tax framework for innovative companies and a legal framework adapted to the situation of the innovative firms.

The “spin-off” phenomenon appeared for the first time in the US and is relatively new to many countries in Europe. In the Republic of Moldova, the term “spin-off” is little known and is not developed. Local science faces various problems; the most pressing is the problem of funding and the economic exploitation of scientific results obtained by scientific institutions and universities. The gaps currently

existing in innovation policy and technology transfer, including scientific-technological parks and innovation incubators prevents the creation of “spin-off” enterprises and at the same time inhibits the growth of the knowledge-based economy. To address these issues, following the example of developed countries, the country should pursue the way of innovation, transfer and dissemination of knowledge to the socio-economic environment, to develop and adopt clear and stimulant policies of these activities.

REFERENCES

1. BORȘA, A. Studii privind implementarea, dezvoltarea și monitorizarea spin-off-urilor academice în domeniul industriei alimentare: rezumat al tezei de doctorat. Universitatea de Științe Agricole și Medicină Veterinară Cluj-Napoca. Cluj-Napoca, 2013 [accesat 14 iulie 2015]. Disponibil: <http://www.usamvcluj.ro/files/teze/2013/borsa.pdf>
2. CANTARAGIU, R. Towards a conceptual delimitation of academic entrepreneurship. In: Management & Marketing Challenges for the Knowledge Society. Bucharest, 2012, vol. 7, no. 4, pp. 683-700.
3. COSTAS, I., OURO, A. et al. From research to market: key issues of technology transfer from public research centres to business [accesat 14 iulie 2015]. Disponibil: <http://www.interreg-sudoe.eu/contenido-dinamico/libreria-ficheros/3D0ED325-A000-2BDC-F737-7534920D685C.pdf>
4. Decreto Legislativo Riordino della disciplina e snellimento delle procedure per il sostegno della ricerca scientifica e tecnologica, per la diffusione delle tecnologie, per la mobilità dei ricercatori: nr. 297 27 luglio 1999. In: Gazzetta Ufficiale. 1999, 27 agosto, nr. 201 [accesat 14 iulie 2015]. Disponibil: http://www.edscuola.it/archivio/norme/decreti/dlavori_99.html
5. ERAWATCH. EXIST - Existengründungen aus der Wissenschaft [accesat 14 iulie 2015]. Disponibil: http://erawatch.jrc.ec.europa.eu/erawatch/opencms/information/country_pages
6. FRANÇOIS-NOYER, V., MARION, S., PHILIPPART, P., VERSTRAETE, T. Promotion of public research: interventions by the french state to promote high-tech venture start-ups by researchers. 2001 [accesat 14 iulie 2015]. Disponibil: http://www.researchgate.net/publication/238789188_PROMOTION_OF_PUBLIC_RESEARCH_IN_INTERVENTIONS_BY_THE_FRENCH_STATE_TO_PROMOTE_HIGH-TECH_VENTURE_START-UPS_BY_RESEARCHERS
7. GALLOCHAT, A. French technology transfer and ip policies [accesat 14 iulie 2015]. Disponibil: <http://www3.grips.ac.jp/~sumikura-mostip/smips/1C1%20GALLOCHAT%20PAPER%20E.pdf>
8. GARCIA-MARTINEZ, J. The Third Way: Becoming an Academic Entrepreneur. 2014, march 20 [accesat 14 iulie 2015]. Disponibil: http://sciencecareers.sciencemag.org/career_magazine/previous_issues/articles/2014_03_20/caredit.a1400073
9. ȚĂCKA, I. The Role of Academic Entrepreneurship and Spin-Off Companies in the Process of Technology Transfer and Commercialisation. In: Journal of Entrepreneurship, Management and Innovation (JEMI). 2012, vol. 8, issue 1, pp. 68-83.
10. LOI sur l'innovation et la recherche: no. 99-587 du 12.07.1999. In: Journal officiel de la République française. 1999, 13 juillet [accesat 14 iulie 2015]. Disponibil: <http://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000759583&categorieLien=id>
11. LERNER, J. The University and the Start-Up: Lessons from the Past Two Decades. In: The Journal of Technology Transfer. 2004, vol. 30, issue 1, pp. 49-56.
12. MAZURKIEWICZ, A., POTERALSKA, B., WNUK, U. Research-Based Spin-Off Creation Models in Polish Economic Conditions. In: Innovation and Entrepreneurship (ECIE): 6th European Conference, 15-16 september 2011. Aberdeen, 2011, pp. 629-636.
13. Norma ANCS nr. 9685/2008 privind înființarea și dezvoltarea de SPIN-OFF-uri de către personalul de cercetare din cadrul unităților de cercetare-dezvoltare. București, 2008 [accesat 14 iulie 2015]. Disponibil: <http://www.usamvcluj.ro/files/carta/corectat/ultima/Regulament%20spin%20off%20USAMVCN.pdf>
14. OZEGALSKA-TRYBALSKA, J. Spin-offs as a form of IP Commercialisation. IPR Regulations for Higher Education Institutions. Krakow, 2010 [accesat 14 iulie 2015]. Disponibil: http://www.mercury-project.eu/fileadmin/mercury/documents/events/TrainingVisits/Krakow/Spin-offs_as_a_form_of_IP_Commercialisation.pdf

15. PATTNAIK, P.N., PANDEY, S.C. University Spinoffs: What, Why, and How? In: Technology Innovation Management Review. Hyderabad, 2014, december, pp. 44-50.
16. PIRNAY, F., SURLEMONT, B., NLEMVO, F. Toward a Typology of University Spin-Offs. In: Small Business Economics. 2003, vol. 21, issue 4, pp. 355-369.
17. RÂNEA, C., FILIPOIU, I.D. ș.a. *Bazele managementului inovării și transferului tehnologic*. Universitatea Politehnică din București. București, 2012. 71 p.
18. Recomandarea Comisiei Europene din 10 aprilie 2008 privind gestionarea proprietății intelectuale în activitățile de transfer de cunoștințe și Codul de bune practici pentru universități și alte organizații publice de cercetare (2008/416/CE) [accesat 14 iulie 2015]. Disponibil: <http://eur-lex.europa.eu/legal-content/RO/TXT/?uri=celex:32008H0416>
19. ROSLI, A., ROSSI, F. Explaining the gap between policy aspirations and implementation: the case of university knowledge transfer policy in the United Kingdom. In: CIMR Research Working Paper Series. 2014, no. 20. ISSN 2052-062X [accesat 14 iulie 2015]. Disponibil: <http://www.bbk.ac.uk/innovation/publications/docs/WP20.pdf>
20. SOMEȘAN, C. Rolul incubatorului universitar, în dezvoltarea inovării, transferului de tehnologii și antreprenoriatului academic. Cazul ITA GOLDTECH ARAD. In: Studia Universitatis „Vasile Goldiș”. Seria Științe Economice. Arad, 2011, vol. 1, pp. 161-174.
21. ȘTRENȚ, A.C., POPESCU, M.I. *Valorificarea rezultatelor cercetării din universități: proprietatea intelectuală și planul de afaceri*. Sibiu: Ed. Universității „Lucian Blaga” din Sibiu. Sibiu, 2011. 209 p. ISBN 978-606-12-0222-5.
22. ГОРДИЕНКО, А.И., ПОБОЛЬ, А.И., ПОБОЛЬ, И.Л. Фирмы спин-офф вокруг академического института как форма развития инновационных сетей в Беларуси. В: Актуальные вопросы развития инновационной деятельности: материалы VII межд. науч.-практ. конф. НАН Украины. Симферополь, 2003, сс. 139-142.
23. ГУЛЯЕВСКАЯ, Н.В., ШУМАКОВА, С.Ю., ПОПОВ, А.И. Взаимодействие предпринимательских структур и научных организаций в развитии экономики инновационного типа. Санкт-Петербургский университет ГПС МЧС России [accesat 14 iulie 2015]. Disponibil: <http://vestnik.igps.ru/wp-content/uploads/V23/7.pdf>
24. НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ «ВЫСШАЯ ШКОЛА ЭКОНОМИКИ». *Коммерциализация университетских разработок*. Москва, 2012. 42 с.
25. ПОБОЛЬ, А.И. Научно-техническое предпринимательство в национальной инновационной системе: закономерности функционирования и развития: автореферат диссертации на соискание ученой степени кандидата экономических наук. Минск, 2009 [accesat 14 iulie 2015]. Disponibil: <http://www.bsu.by/Cache/pdf/303733.pdf>
26. Федеральный закон О внесении изменений в отдельные законодательные акты Российской Федерации по вопросам создания бюджетными научными и образовательными учреждениями хозяйственных обществ в целях практического применения (внедрения) результатов интеллектуальной деятельности: № 217 от 02.08.2009 [accesat 14 iulie 2015]. Disponibil: http://www.consultant.ru/document/cons_doc_LAW_90201/
27. Фонд содействия развитию малых форм предприятий в научно-технической сфере [accesat 03 iulie 2015]. Disponibil: <http://www.fasie.ru/programmy/kommertsializatsiya/>

Recommended for publication: 15.07.2015