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INNOVATION SUPPORT MEASURES IN UKRAINE: SOME LEGISLATIVE AND ORGANIZATIONAL ASPECTS

Abstract. This article contains brief description of the situation in innovation sphere in Ukraine, based on utilization of traditional statistics of innovation activities, results of calculations of the place of Ukraine in the EU Innovation Scoreboard. Special attention is paid to the evolution of the legal foundations of support in innovation activities and the existing elements of innovation infrastructure. Also, it focuses the importance in the innovations ventures like techno parks, science parks and others have for the future of Ukraine. Finally, conclusions and recommendations are made about the current status of the S&T and innovation activities in the country.

Keywords: Innovation policy, technopaks, science parks, legislation, European Innovation Scoreboard.

INTRODUCTION

Key features of the Ukrainian innovation system. In recent year Ukraine has experience a difficult period of its history. The economic crisis and the political unrest had negative impact on the R&D sector and innovation activities in the country. In this regard, the share of R&D expenditures in GDP dropped to all times low level of 0.48 % in 2016 from more than 1% a decade ago.

The share of innovative enterprises in industry rose from the minimal level of 10% to approximately 15-17%. Nevertheless, the methodology to calculate this element has changed. This creates substantial problems to compare the data for different time periods [1]. At the same time, the expenditures on innovation activities have dropped substantially in 2014 and 2015 in comparison

with previous years. However, it is possible to identify two peaks of growth in the innovation activities in Ukraine: in 2007 due to the expansion of cheap bank loans, and in 2011 due to solar energy program.

The difficulty relies not only in decline of financial options for R&D projects in Ukraine. In general, R&D sector in Ukraine remains unreformed and its capacity is underutilized. The level of innovation activities remains at low levels in comparison to the neighbouring countries in Central and Eastern Europe (see **fig. 1**).

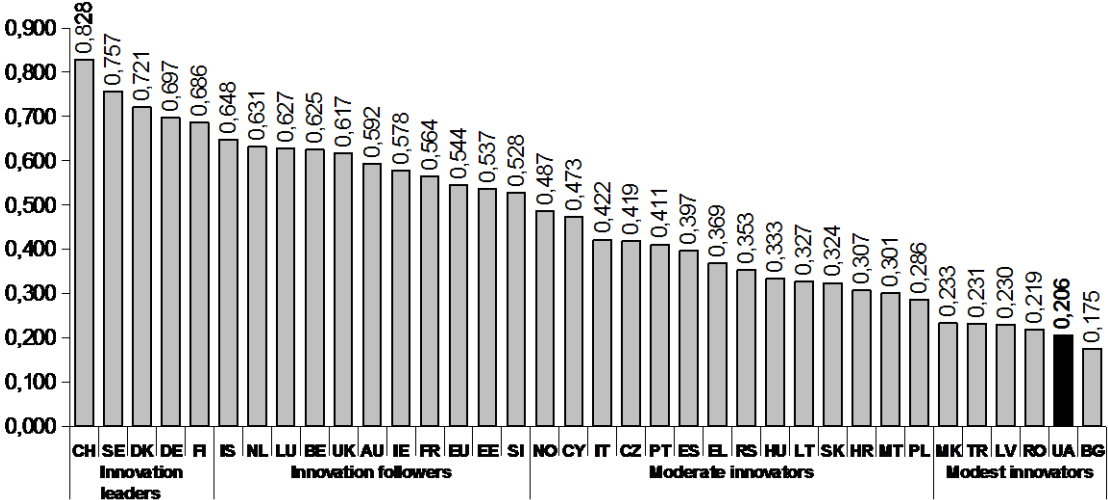


Fig. 1. Position of Ukraine (UA) according to the Summary innovation index for EU, Ukraine and other countries, 2014

Source: European Innovation Scoreboard, 2016*.

These difficulties in the R&D and innovation sectors in Ukraine can be tracked back to the last two decades and now they have reach such a proportion where a fast or inexpensive solution are not possible.

In general, the government of Ukraine does not have a comprehensive provision regarding innovation and business support services in this sector. The infrastructure is largely underfunded and not equipped with the necessary tools, methodologies and knowledge to provide a state of the art support services [2]. This in turn affects the start-ups and SMEs in the country whose potential customers are increasingly demanding a well provided services. For that, the

* It is worth to mention that after changes in methodology of composition of the Summery Innovation Index in 2016, Ukraine could not provide corresponding data for calculations.

lack of decent infrastructure sets a barrier at the moment to develop an international network. As a result, the start-ups and SMEs are not often able to cope with the external demands when it comes to the necessary knowledge needed to innovate and develop commercial viable products and services. In this regard, the production speed and quality of the Ukrainian R&D sector has to contend the increasingly competitive and complex global market [3].

The aim of the study is to analyze instruments of support of innovation activities in Ukraine and to propose recommendations on the changes in innovation sphere in the country in the context of Eurointegration process.

MEIN TEXT

Main elements of the innovation support measures in Ukraine. Legislative instruments of support of innovation activities. After Ukraine acquired its independence in 1991, more than 80 different legislative acts passed through the Parliament or were issued by the Ukrainian government. This period of reforms continued in 2014-2016 in order to resolve a number of problems in S&T and innovation at the local level. For that the Ministry of Education and Science of Ukraine (MESU) along with other ministries, the State academy of Sciences and non-governmental organizations substantially modified the law of Ukraine "On Scientific and Scientific-Technical Activity". This law was approved and passed through Ukrainian Parliament at the end of 2015.

The new version of this Law contains a number of amendments, in order to improve the previous version. In this regard, the new law reinforces the institutional support of S&T activities and opens the way for the transformation of the national research system. Similarly, the law establishes the National Council of Ukraine on Science and Technology Development (NCUST) under the control of the Cabinet of Ministers of Ukraine. The main task of this body is to ensure the effective cooperation between representatives of the scientific community, state agencies and private sector in the preparation and

implementation of state policies in the sphere of S&T. The NCUST was conformed in late May 2017 by of two separate committees: the administrative and the Scientific. Each committee has 24 members. The members of the Administrative Committee are nominated by the central government, and the members of the Scientific Committee are elected by representatives of the scientific community.

Another addition is a creation of the National Fund for Research instead of the State Fund for Fundamental Research (SFFR). SFFR is subordinated to the MESU. The main function of this fund is to provide support for basic and applied research in natural sciences, engineering disciplines, humanities and social sciences in the shape of grants for these studies. Notwithstanding, the delay in the conformation of the fund seems to be problematic. It would be difficult for the NCUST to forge the fund before the 2018 fiscal year. For this reason, the tentative start work date of the fund could be moved to 2019.

The new law plays an important role in the transformation process of the State Academy of Science of Ukraine. The Law has opened the option for every scientist to be elected in the governing bodies of the Science Academy. Similarly, it also establishes constraints on the possession of highest positions in the Academies and on the number of members and corresponding members of the academies. In addition the new law opens the way for research institutions from the government sector to be co-founders of commercial companies taking part in the formation of such share capital ventures.

There are other important legislative acts in the sphere of S&T and innovation like the laws on “On special regime of innovation activity of technological parks” [4], “On Scientific Parks” [5], “On state regulation of activity in the sphere of technology transfer” [6] among others. All of them require corresponding changes to be in line with economic reforms, announced by the government.

It is also important to mention that the Ministry of Education and Science prepared draft version of the law “On supporting and development innovation” in 2016. This law substitutes the existing law ‘On innovation activities’*. This is because the previous version of this law was not effective. This law contained a number of declarations about the importance of innovations and some basic definitions in innovation sphere. The first version of the Law had also clauses, which provided specific incentives for innovation activities, including lower level of taxation for innovation enterprises*. However, the implementation of these norms has been postponed for the first two years, and later it was abolished. The main reason was the possible decline in revenues from the sectors anticipated by the Ministry of Finances. For that, the level of incentives was not justified properly but it was possible, at least, to try to use them in some sectors of the national economy.

The new law has to determine the forms of public-private partnership (PPP) in the innovation sphere (clusters, technological platforms, startups). This includes the necessary instruments to develop PPP in innovation. For that, the new law simplifies the procedures to obtain government support on innovation projects. This is done with the aim to define the functions and sources that will finance the Innovation and Development Fund that has to be created under the new law. This aspect will devise the mechanism to attract private, domestic and foreign investments to the innovation and development sector in Ukraine. This will be done by creating innovative venture capital funds with favorable conditions for their functioning. Nevertheless, it is not clear if all initiatives including the creation of the fund will be supported by the Ukrainian Parliament. Considering that passing and implementing this kind of laws in the parliament is not a simple task. This is due to the large number of ministries and state

* First version of this law passed through the Ukrainian Parliament in 2002 but some changes were made several times during the last fifteen years.

* To be precise, in Ukraine, this could be applied not to enterprises, but to their innovation projects. Innovation project, not company is the key objective of possible incentives in Ukrainian legislation.

agencies, including Ministry of Economic Development and Trade, Ministry of Finances, Ministry of Education and Science and some others* involved in this process that are required to approve such legislatives acts. This impediment can be seen in the laws ‘On Amendments to Law of Ukraine ‘On innovation activity of technological parks’; ‘On Amendments to the Tax Code of Ukraine’, ‘On Amendments to the Budget Code of Ukraine (to add the chapters, related to introduction of incentives for innovation activities)’, ‘On Amendments to the Law of Ukraine ‘On state regulation of activities in technology transfer’ among others.

Ukraine tries to utilize modern instruments for innovation development by implementation of other legislative acts. The new law on PPP (2015) opens new opportunities for innovation activities in Ukraine. Ukraine has already a number of PPP in different areas, some of them are objects of innovation activities, especially in waste processing and energy sectors (**fig. 1**).

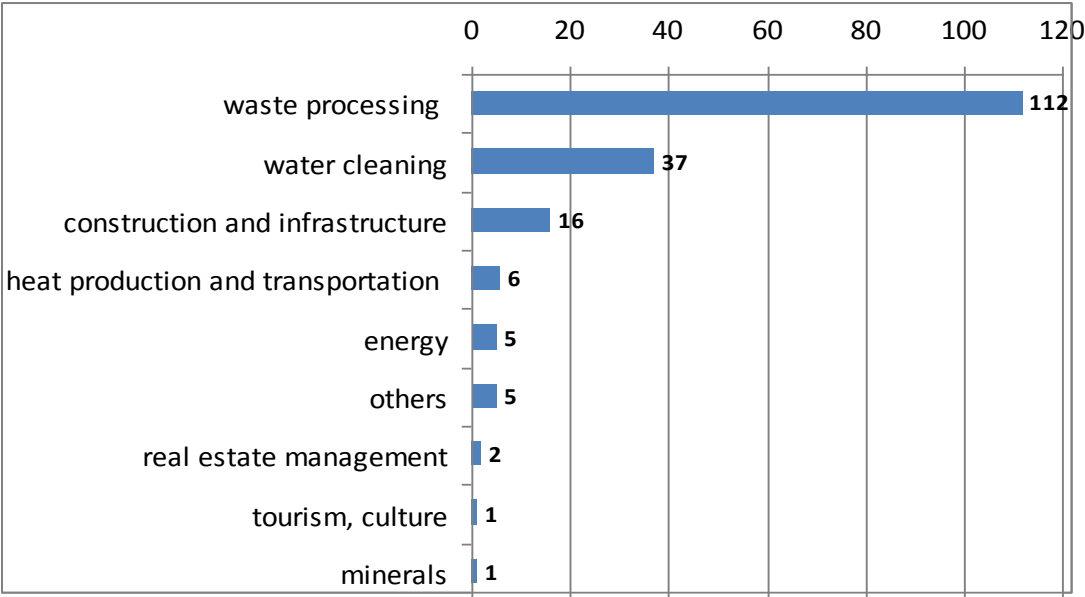


Fig. 2. Key areas of PPP in Ukraine
 Source: Ministry of Economic Development and Trade of Ukraine, 2017.

The new Law on PPP makes it easier to implement new technologies by attracting domestic and foreign private capital for innovation projects. Previous

* Number and the list of ministries and agencies can vary, depending on the specific law.

regulation in PPP sphere comprised concessions only. Now, it is possible to extend PPP on other types of activities. It is worth to mention that creation of specific forms of innovation support, like industrial parks, looks as the most promising form of PPP [7].

In the first two and a half decades of independence, research and innovation policies in Ukraine were mainly directed from the central government, while the role of the local authorities to exert influence on S&T and innovation development was limited. Within the 2015 decentralization reform the situation has changed and the regional governments could become important actors in their formulation and implementation of these projects. The reform will allow the local tax revenues in the regions to growth and at the same time, it will give empower the regional leaders make them part of the decision-making process on how to support innovation initiatives.

However, the local authorities still play a trivial role in S&T policy. There is a lack of specific governance system for R&D and innovation throughout various regions of Ukraine. There are examples of support to regional initiatives from the private sector in the past. In this regard, the ISD of Mr. Rinat Akhmetov has supported implementation of energy-saving technologies and comparative analysis of the Ukrainian regions according to the WEF methodology [8].

According to the proposed changes in legislation, one of the primary responsibilities given to regional authorities involves the formulation and financing of the regional R&D and innovation programs within the limits of regional budgets. The authorities are also required to create a regional financial organization to provide loans for R&D and innovation projects. Finally, regional authorities are also designated to control and evaluate R&D and innovation activities, using economic resources from the regional budgets. However, in reality the local authorities have almost no funding to support for R&D. In recent years, the regional share of total funding for R&D has been close to

1%. For the period of 2015-2016, these expenditures dropped to level of 0.3% of total R&D spending. The total research budget of regional authorities was less than €2m according to official exchange rate in 2015. However, in some regions, development programs have sectoral dimension. These regions typically influence R&D through indirect measures, such as provision of land, upgrading of infrastructure, or through lobbying interests of local research organizations in Kiev (Kyiv). They also tend to exert influence on the central government by requesting funding increases for R&D organizations, by including research components in their regional development programs. The first comprehensive program was created by the Donetsk region more than decade ago. Later, almost all regions have prepared this kind of programs.

Due to the processes of decentralization, it is possible to expect that in the near future this situation could change substantially. The local authorities will have more financial resources in their hands to stimulate R&D innovation in the interests of their communities and regions.

The recent and proposed changes in the Ukrainian legislation could be considered as positive. However, previous experience shows that the proper implementation of legislative acts traditionally remains as one of the weakest part of S&T and innovation policy. Usually, it is related at the need to modify a number of other legislative acts. This process takes time and substantial efforts from those, who propose the changes, even if the changes are initiated at the level of the specific ministry or parliamentary committee who? Another reason is the lack of money for the implementation of corresponding acts. Sometimes, the lack of political will and or differences between the political forces plays an important role in this development.

Innovation support organizations. Officially, the country has a substantial number of innovation support organizations. The Creation of these entities can be considered as an organizational innovation, initiated by the Ukrainian government. The Ministry of Science and Education of Ukraine has

provided an extensive data on specific organizations focused on innovation that were created with the direct support of the Ukrainian government (see **table 1**).

It is important to note that not all these organizations are active in the local innovation sphere. The Ministry of Education and Science of Ukraine collects general data about these organizations, yet this information is not published openly. Only some types of organizations provide more or less detailed information about their activities*. This information will be presented below.

Table 1

Organizations of innovation infrastructure in Ukraine, 2016

Organizations of innovation infrastructure	Number
Technoparks	16
Innovation Business Incubators	24
Innovation Centers	22
Centers of IP Commercialization	38
Innovation and Technology Transfer Centers	24
Centers of science, engineering and economic information	14
Innovation Venture Fund	1
Science parks	21
Research results implementation enterprises	27
Others	263

Source: Ministry of Education and Science of Ukraine, 2017.

The values in the Table 1 can be considered as overestimations of the number of these organizations in Ukraine. Some of these organizations exist only on paper as a formality. Their activities are reduced to collection of information at the local level. This is a reality for some centers of commercialization and regional centers of IP commercialization. Usually, these organizations have support from the central government or the local administration. However, this support only helps to cover a small portion of the expenses these organizations have. It normally covers rent, utilities, and the salaries for 2 or 3 employees.

* Ministry of Education and Science collects more or less detailed information on technoparks and science parks but in different formats. Information on other organizations is very scarce. As a rule, it is reduced to the number of such organizations only.

Technoparks. According to the MESU, 8 technoparks (out of 16 announced and 12 registered) are operating. The main objective of the technoparks as specific innovation support organizations is to organize the high-tech production and at the same time to provide comprehensive assistance in the development and implementation of new technologies. The list of technoparks with their brief description can be found in the Annex 1.

For the period 2001-2014, the support of technology parks by the government amounted to 510 million UAH. In turn, the technoparks transferred 1033 million UAH to the state budget during this same period of time. This represents a proportion of almost 2 UAH to 1 UAH when it comes to revenues obtain from this activity [9].

Key indicators of the technoparks activities are presented in the **table 2**.

Table 2

Key indicators of the technoparks activities in 2000-2014

Indicator	Total
Number of projects in technoparks, number	120
Volume of innovation production mln. UAH	12 654
Including export, mln. UAH	2007
Import of components and equipment , mln. UAH	1859
Taxes paid, mln. UAH	1543
Including taxes to the central budget, mln. UAH	1033
Subsidies to technoparks, mln. UAH	510
Balance, mln. UAH	523
New working places created, number	3 5643
Total investment, mln. UAH	531
Total volume of loans, mln. UAH	3 502
Total budget financing, mln. UAH	51

Source: Internal information of the Ministry of Education and Science of Ukraine, 2016.

It is worth to mention that the creation of the first technoparks in the late 1990s was a successful experience in regards to the management and commercialisation of research projects. However, this experience is associated with functioning of technoparks in 1999-2005 only. Technoparks can be regarded as a group of high-tech companies, scientists and engineers, who were

able to received favourable conditions for the realisation of their innovation projects.

One of the best examples of this policy can be seen in the techno parks that were created by the institutes of the National Academy of Sciences of Ukraine. This technopark was developed with a strong technological orientation provided by the Paton Institute Electric Welding and the Institute of Monocrystals*. These two technoparks concentrated more than 90% of the innovation projects in terms of the output of the volume contracted [10]. As aforementioned, tax privileges could not be received by the institutes or companies themselves. In this sense, the only bodies entitled to receive this grants are the specially registered executioners of the innovation projects. These projects have to be considered by a panel of independent experts and after this by a special commission composed by specialists and experts from the technopark. This commission will judge and decide how innovative the projects presented are. The key indicators for assessment are the level of innovativeness, level of readiness of the prototypes, results of market reviews for new products or processes, including export potential, levels of expenditures and revenues among others.

The technoparks were a success in innovation activities in their first years of existence 1999-2004. However, after the abolishment of the tax privileges in 2005, the number of innovation projects stagnated, and the importance of technopaks for the national innovation development started to decline since 2010s.

Statistical data shows that the peak of the activities was registered in 2006-2007. On the other hand, in 2010-2014 both the financing and tax payments dropped to almost a zero level [11].

* This is an official title of the institute in English.

Science Parks. Another form of support of innovation activities and commercialization of R&D results is so-called science park. Ukraine has 21 such parks at the moment. However, data on 19 of them only could be found in the official list of science parks. According to the Law of Ukraine ‘On science parks’, science park is a legal entity that is created at the initiative of universities and/or research institutions by pooling of resources of the founders for the organization, coordination, management of science park projects. In reality, most of the science parks were established by the universities or by joint effort between universities and research institutes.

Science parks were created with the purpose to manage effectively and efficiently the existing scientific potential. This includes the material and technical base for commercialization of the results of scientific research and their further implementation in the domestic and foreign markets [12].

The founders, partners and project executors of the science parks can use the property of the state organizations involved in this activities on favourable conditions. The funds received from the lease of the state property shall be directed only to the implementation of the agreed projects of the science park.

Moreover, in accordance with the Customs code of Ukraine, the laboratory and research equipment, components and materials provided by the scientific park to develop the project should be exempt from the import duties.

Currently, science parks are conducting over 42 projects in different areas like satellite communication systems, radio relay communication system, energy-saving technologies, electronic systems and networks and the creation of information-analytical systems, development of e-government technologies, creation of intellectual informational, communicative and analytical technologies, and integrated databases among others.

The «Kyivska Polytechnika» is the most well-known science park in Ukraine. It was established over ten years ago by the National Technical University of Ukraine in compliance with the Law of Ukraine “On Science Park

“Kyivska Polytechnika” No. 523-V of December 22, 2006. The Kyivska Polytechnika is currently developing 11 projects with a total value of 10,245.3 thousand UAH. Science Park “Kyivska Polytechnika” is working on unmanned aerial vehicles (UAV) under the contract with the Ministry of Defense of Ukraine since 30.05.15. This project has been implemented with the aim to increasing the defense capability of the country, with investment support from the Venture Fund named after Academician Mikhalevich, the total expenses on the project amount 13 million UAH. This park has also other defence-related contracts in different areas with the State enterprise "Ukroboronservis". The total value of these contracts reaches 4 million UAH.

The park has started a joint innovation project in the space sector, which involves partners from other cities and organizations. It is expected, that this project could attract funds of almost 60 million USD.

Since 2012, the science Park hosts the annual Ukrainian Festival of innovation projects "Sikorsky Challenge". The participants of this event can present independently prepared business-oriented projects that are innovative in nature and which have scientific and practical value. As a result, contracts for more than 573 million UAH were signed between participants and investors during the Festival "Sikorsky Challenge -2015".

Comparing the support provided by the government to these organizations is evident that the Technology Parks received more benefits than the Science Parks. This can be seen in the benefits granted to the Technology Parks in the implementation of projects related to the industrial production of innovative products and products processes.

In turn, the science parks are focused on the development of scientific and technical processes at the experimental stage. Science Parks are not oriented towards the mass production of innovative products.

Some science parks established their own start-up schools. In these schools, experienced instructors teach course that cover the basics of innovative

entrepreneurship. This aid in the development of business models and to present business plans to potential investors with the intent to attract investments for the implementation of the projects generated by these startups. The startup schools help young people to test the validity and the scope of their ideas and products. The courses are focus on developing the necessary skills and knowledge in innovation. This is also combined with the commercialization of new technologies.

While start-ups are a vulnerable species in the current global scenario, they face particular challenges in an economy of transition like in Ukraine. As a result, the Ukrainian National Innovation System has obstacles at the moment to promote the establishment of new high-tech start-ups. The central government has done efforts to set different researchers networks, innovators, universities and other organizations by coordinating special workshops and conferences. These meetings often are between the administrations of the science parks and or experts from the EU programs on technical assistance. Nevertheless, these efforts have not been very successful. The main issue is that the start-ups do not see any practical results in participating in this kind of events. This networks events are usually organizing to set information exchange mechanisms: meetings, conferences, training, access to expertise, databases, and other types of information, Centers of science, engineering and economic information. They establish benchmarks for best practice when it comes to project development. Here the members can rate their performance against their local or international peers. They support the professionalization of organizations and individuals within their sphere of interest. The networks themselves become learning organizations that promulgate good practice. In general, Ukrainian innovation and business support infrastructure is under networked, in comparison to their Western counterparts. The Ukrainian innovation and business support infrastructure is not as actively engaged in networks as happens in the West.

There is no official data about activities of the other types of organizations that were created to support innovation in Ukraine. Notwithstanding, some general data about the total number of these organizations is available, yet their activities are not visible enough to be analyzed in details.

Taking into consideration the chronic state of most business support organizations in Ukraine, the lack of international links might be seen as a minor problem. However, being isolated from the international learning experiences, best practices, methodologies prevent these organizations to perform their job effectively. In this sense, they cannot provide business support services in an adequate manner, a situation that makes it increasingly difficult for the business to become more competitive Ukraine. The Ukrainian innovation and business support infrastructure must be equipped with appropriate resources that comply with the international standards when it comes to business support services methodology and tools. This in turn will help to minimize the gap between the Ukrainian organizations and their potential foreign counterpart.

CONCLUSIONS AND RECOMMENDATIONS

The problems in the S&T and innovation spheres in Ukraine can be only solved by co-ordinating efforts between the state and the scientific community.

Ukraine not only needs a serious transformation within the S&T and innovation systems. It is also important perform changes in the business environment in the country. For that, the introduction of adequate legal protection for intellectual property rights, is critical moved that has high impact for individual researchers, S&T institutes and innovative enterprises especially from foreign countries. This is also important for foreign companies looking forward to engage in direct investment or some other forms of business alliance. Similarly, this will facilitate the cooperation between foreign and domestic companies. Ukraine needs more institutions that have potential to finance the innovation sector. These institutions should be willing to accept the high level of

risks in turn for high potential profits. For this reasons, this institutions they will not require collateral or charges for interest. In this regard, it would be also important to provide short, medium and long term loans to contribute to the development of the innovation activities in Ukraine. For the business environment, it is useful to create conditions where entrepreneurs will be willing to trade significant part of their shares to alien entities that will be willing be acquired or to participate in public offerings. The labour market has to be sufficiently flexible in order to provide the necessary work force for the growing firms.

Special attention has to be paid to the development of cooperation with the member of the EU. This cooperation can provide important expertise in advance areas and it will help to compensate the abovementioned difficulties of the national innovation system of Ukraine. Some preconditions to expand these cooperation agreements are already in place. In this sense, Ukrainian researchers are currently develop projects to have a more active participation in the H2020 funding scheme.

The increase in the R&D and innovation expenditure itself cannot solve the institutional problems that exist in Ukraine. The main challenge to the government in the S&T areas is to empower the national research organizations to contribute in a better manner to the economic recovery of Ukraine and its further development. For the time being, the investment in R&D is viewed largely as a liability. This is partly the result of structural and organisational mismatches that hinder the development of these projects. Similarly, the low relevance these investments have for the market realities also offers a setback for its development. The creation of favourable conditions for science based SMEs can help to solve the problem of adequate utilization of intellectual capacities of scientists and engineers. Furthermore, it can contribute to a positive structural change in the national economy, which has a high shares in traditional heavy industries.

Ukraine urgently requires an organizational transformation to stimulate innovation activities in the country. Horizontal innovation policy coordination is necessary in the country due to the complex government and administration organization present in Ukraine. This is done with the intention to allow different entities to coordinate their activities in and beyond their policy fields (horizontalisation). This is a complex and dynamic process that must be taken into account when it comes to the development of S&T, paying especial consideration to the internal and external factors present in this process. For that coordination is treated as a process, not as the outcome. As seen, this is a highly complicated task that requires an advanced level of coordination between the various policy instruments. This usually includes public funding that at times is hard to get in countries with transitions economies like Ukraine. Moreover, regulatory changes can affect the investment in R&D without the intervention of public funds. This can be achieving attracting foreign investment to the country either private or governmental in order to develop R&D projects in Ukraine. Similarly, benefits in subsidies, tax incentives, loans and regulations (e.g. environmental regulation can have a significant impact on innovation) can have a positive impact for the R&D sector in Ukraine.

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ЗАХОДИ З ПІДТРИМКИ ІННОВАЦІЙ В УКРАЇНІ: ДЕЯКІ ЗАКОНОДАВЧІ ТА ОРГАНІЗАЦІЙНІ АСПЕКТИ

Резюме. У цій статті подано короткий опис ситуації в інноваційній сфері в Україні на основі використання традиційної статистики інноваційної діяльності та результатів розрахунків місця України в Інноваційному табло ЄС. Особлива увага приділяється розвитку правових основ підтримки інноваційної діяльності та існуючих елементів інноваційної інфраструктури. Також у статті підкреслюється важливість для майбутнього України впровадження так форм підтримки інновацій, як технопарки, наукові парки тощо. Наведено висновки та рекомендації щодо поточного стану науково-технічної та інноваційної діяльності в країні.

Ключові слова: інноваційна політика, технопарки, наукові парки, законодавство, Європейське інноваційне табло.

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ПОДДЕРЖКА ИННОВАЦИЙ В УКРАИНЕ: НЕКОТОРЫЕ ЗАКОНОДАТЕЛЬНЫЕ И ОРГАНИЗАЦИОННЫЕ АСПЕКТЫ

Резюме. В этой статье подано краткое описание ситуации в инновационной сфере в Украине на основе использования традиционной статистики инновационной деятельности и результатов расчетов места

Украины в Инновационном табло ЕС. Особое внимание уделяется развитию правовых основ поддержки инновационной деятельности и существующих элементов инновационной инфраструктуры. Также в статье подчеркивается важность для будущего Украины внедрения так форм поддержки инноваций, как технопарки, научные парки и др. Приведены выводы и рекомендации относительно текущего состояния научно-технической и инновационной деятельности в стране.

Ключевые слова: инновационная политика, технопарки, научные парки, законодательство, Европейское инновационное табло.

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