INNOVATIVENESS OF UKRAINIAN ENTREPRISES

Agnieszka PIOTROWSKA-PIĄTEK[1*], Yuliia MATSKEVYCH[2]

[1] Kielce University of Technology, Faculty of Management and Modelling Department, Statistical Office in Kielce; apiotrowska@tu.kielce.pl; a.piotrowska-piątek@stat.gov.pl
[2] Pryazovskyi State Technical University, Mariupol, Ukraine; matskevich_yuliy@ukr.net
[*] Correspondence author

Abstract: The article regards the issue of innovative activity of enterprises in the Ukraine. The basis for presented consideration is mainly the overview of the literature and *desk research* analysis on the basis of the data of Ukrainian Statistics for 2014-2016. The article presents data regarding the innovative activity of entrepreneurs, type of innovation, diversity of activity depending on the size of the enterprise, type of business activity, location, as well as the funding of the innovative activity and cooperation in introducing innovative activities. The data analysis reveals similar dependencies in Ukraine as in other European countries: the scale of innovative activities significantly depends on the size of the enterprise, there is a big differentiation of innovation activity from business type and spatial diversifications.

Keywords: innovativeness, innovation survey, Ukrainian enterprises, economy of Ukraine, Ukraine.

1. Introduction. Role of innovation in modern economies

At present, knowledge is considered to be one of the most important conditions for the development any country's economy. According to the World Bank, knowledge-based economy (KBE) is a system in which the assets of knowledge are ascribed more importance than capital and labor and where the level and the advancement of knowledge permeating economic and social activity of the inhabitants is high (World Bank, 2007, p. 14). Modern knowledge is increasingly replacing capital as the basic source of social welfare. Ability to create it, and, first of all, transforming it into new products, services and technologies is deciding about the market success of enterprises. Nowadays, knowledge is gradually replacing labor and capital as the basic source of social wealth. Ability to create it, and, first of all transforming it into new products, services and technologies is decisive in market success of enterprises and the entire economy. Economy requires a specific "fuel" such as innovations that reach the market and consumers in the form of new products and services. In these conditions, creativity, innovation and entrepreneurship constitute complementary

mechanisms building the dynamics of changes and competitive strength of business (Cieślik, et al., 2011, p. 16).

Invoking the history of the economy, it is worth mentioning that currently new theories of economic growth are being developed – the so-called endogenic theories – and these are better suited to explain processes occurring within the economy. These theories (as opposed to the neoclassical models that are based on the assumption that the basic factors of production are labor and physical capital with the growth determined by egzogenic technological progress) technical progress is endogenic in nature, while the key role in economic growth is played by human capital (c.f.: Bocian, 2006, p. 354). The central element in the theory of new growth is the assumption of growing rate of return on capital from knowledge (knowledge is not subject to the law of diminishing return). In neoclassical models of growth, decreasing rates of return were a basic premise, which found its justification in the cases of traditional means of production: soil, unqualified labor and fixed assets (Florczak, 2009, p. 218). Among the new growth factors one must point out new ideas, the application of which brings important implications for the aggregate production function in the form of effects of scale and growing revenue from the invested capital (Liberda, and Maj, 2017.03.01).

The key role for the economic growth of a given country is played by activities characterized by innovativeness - introduction of new products and services to the market and taking action that improves the organization of the labor processes in the company and relations with the surrounding environment. Innovation is considered usually as a multi-dimensional phenomena: process, outcome and mindset (cf.: Kenneth, 2018). The issue of innovativeness is a research problem tackled both by public statistical services, private research agencies as well as individual researchers.

This article regards the issue of innovative activity of enterprises in the Ukraine. This is a problem that is discussed relatively infrequently in the literature, which to some degree results from the limitations to data access.

The basis for considerations presented in the paper is the overview of the literature and publications regarding the topic at hand (traditional as well as online sources), *desk research* analysis on the basis of the data of Ukrainian Statistics (The State Committee of Statistics of Ukraine) for 2014-2016 (www.ukrstat.gov.ua) and Statistics Poland (international statistics: official macroeconomic data and data regarding the digital society (www.stat.gov.pl)) as well as own observations (one of the authors is a Ukrainian citizen).

2. Innovativeness of the Ukrainian economy

Ukraine is an example of a state that has gone through the process of gaining independence (1991) and intensive transformation in the fields of politics, economy and society. Since 2009 it has been taking place in the EU Eastern Partnership Programme and since 2016 it has been a member of the free trade zone with the European Union. At present, it is an important partner for Poland and other EU states regarding trade and investment expansion.

The literature on the subject frequently states that the level of innovativeness of Ukraine's economy is low, due to the level of expenditure on innovative activity (cf: Oleksiuk, 2014, p. 103). In 2014 the share of expenditure on scientific publications as well as science and technical research in the GDP of Ukraine was 0.6% and in the subsequent years amounted to 0.55% and 0.48% respectively.

The overview of theoretical international results of innovativeness rankings of particular economies is a reason for optimism. In the latest ranking of Bloomberg economic agency, Ukraine was ranked 42 from among 50 most innovative world economies, thus dropping one rank lower in comparison to the previous measurement. The Global Innovation Index ranked Ukraine 43th thus 7 positions higher in comparison to 2017.

Evaluating the innovativeness of the economy of a given country one usually takes into consideration the indicators referring to the productivity, outlays on innovative activities of people hired in the R&D, patent activity, level of higher education or the development of IT society and quality of life. Referring to the last area, a positive change that has occurred in the Ukraine since 2000 as for the number of Internet users, can be seen on Figure 1.

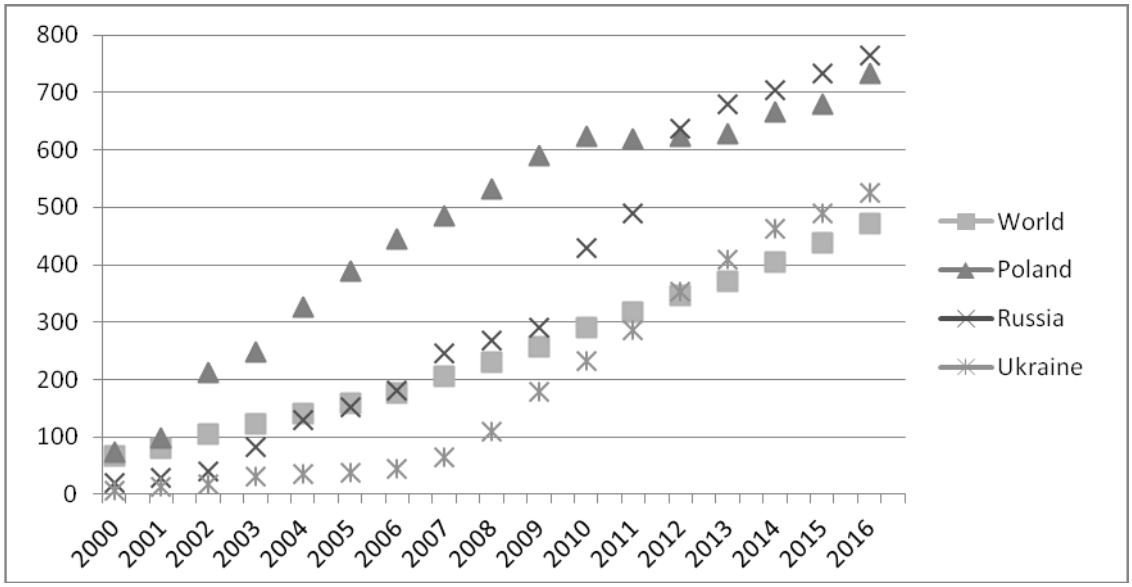

Figure 1. Internet users per 1000 citizens in the Ukraine between 2000 and 2016. Source: own elaboration on the basis of data available at: http://stat.gov.pl/statystyka-miedzynarodowa/porownania-miedzynarodowe/tablice-o-krajach-wedlug-tematow/nauka-spoleczenstwo-informacyjne-innowacyjnosc/ (2018.07.10).

Innovativeness of the economy is strictly related to the general macroeconomic situation of a given country. The economy of the Ukraine in recent years was subject to significant oscillation. After significant growth of the GDP by 12.1% in 2004, a drop was observed to the level of 2.7% after a year. After a period of time when the GDP growth was stable at a level of 7%, in 2008 a downturn was observed, while in 2009 there was a deep GDP slump by 14.8%, in fact, this was the most severe drop in all Commonwealth of Independent States. After a short period of small improvement in 2010-2011 in two subsequent years stagnation took hold. In 2014 a deep depreciation of the Ukrainian currency happened. Other unbeneficial processes also took place – high inflation (24.9% YOY) drop of industrial production and investment, drop in export and import, decrease of foreign direct investment.

3. Conditions of conducting business activity in Ukraine

The possibilities and principles of conducting business activity in the Ukraine is specified by the *Ukrainian Constitution and the Economic Code of Ukraine* (introduced in 16.01.2013, latest amendments introduced in 2018). *Ukrainian Constitution* stipulates that everybody can undertake business activity, if it is not banned by law. There are limits regarding state officials (including the officials of the territorial local governments) and deputies appointed to the Parliament. According to the status as of 01.06.2018 the number of businesses in operation was 1 256 875, which when compared to population gives an index of 29.8 businesses per 1000 citizens. By comparison, in Poland in 2017 the number of entities entered into the REGON register per 1000 inhabitants was 112. Businesses in the chemical, mining, metalworking, power energy, chemical, oil refining (production of fertilizers, oil refining, pharmaceuticals), machine building and food production have the biggest share in key industries in terms of relevance for the economic growth (http://uifuture.org/…).

It might seem that currently the Ukrainian economy is leaving the crisis behind and the implemented changes should be treated as signals striving to the development of market economy. In the latest report by the World Bank "Doing Business 2018" Ukraine was ranked 76 out of 190 evaluated states and improved its position by 1.9 percentage points in comparison to the 2017 issue.

In the second held of 2017 beneficial regulatory changes were introduced in the Ukraine, which have made the trade easier including:

- automatic reimbursement of VAT (electronic VAT reimbursement system),
- introduction of the act on the protection of business from legal protection authorities,
- introduction of the so-called *squeeze-out* Act,
- increasing the possibility of implementing electronic payments,

- steps aimed at increasing the use of electronic handling of documents,
- increasing the access to public information (data regarding state activity).

In the beginning of 2017 the Ministry of Economic Development and Trade ordered the Ukrainian Institute for the Future to conduct research and prepare "Proposition for paramount activities aimed at the development of Ukrainian Industry". According to the above evaluation of the Institute, the realization of recommendations included in the development plan for 2017-2018 will help increase the investment in the Ukrainian industry by 2.3 billion dollars and increase the GDP by 4.3 billion dollars, which constitutes 4.5% of nominal GDP of Ukraine and may generate hundreds of new jobs (Ukrainian Institute for the Future, 2017, p. 10).

With this being the case, the business activity of Ukrainian entrepreneurs is hindered by a number of factors, among which one must mention:

- economic factors (e.g. currency instability, devaluation, inflation, complex tax procedures),
- political factors (no political stability, "indeterminacy" both political and legal, declarative behavior on the side of authorities instead of real actions),
- too slow reform process (lack of judicial reform, reform on the labor market, land use reform, slow modernization of infrastructure etc.),
- corruption (no real corruption fighting from the side of the state despite formally existing solutions enshrined in the *Act on preventing corruption* dated 14.10.2014).

4. Analysis of innovativeness of Ukrainian enterprises in 2014-2016 – methodology

The analysis of innovativeness of Ukrainian enterprises has been conducted on the basis of data of The State Committee of Statistics of Ukraine coming from the study based on methodological standards of the Community Innovation Survey (CIS) encompassing the time period between 2014-2016 (The State…, 2017). The first examination of this type was conducted in the Ukraine in 2010 (it regarded the time period between 2008-2010). From that time on, the research of innovation was conducted with a two-year frequency on a representative sample of industrial enterprises and those from the service sector employing over 9 people.

The above mentioned research included a broad definition of innovation. According to the assumed methodology (Oslo Manual OCDE…, 2005), referring to the Oslo Manual textbook (Oslo Manual Innovation…, 2011), innovative activities include all scientific, technological, organizational, financial and commercial activities leading to innovation or created with innovative purposes in mind. Innovation include also R&D activities which are not directly

related to the preparation of concrete innovation. Innovation is the implementation of a new or improved product (product or service) or a process, new organizational method or new marketing method in a business practice, organizing the workplace or in relations to the surrounding environment. Statistical research of innovation encompasses all possible levels of novelties and the feature that they have in common is that they have been implemented.

A business is considered as innovative, if in the specified period of time it has introduced some innovation. The taxonomy of innovation based on the OSLO methodological standard distinguishes the following types of innovation: product, process (known as innovational technologies), organizational and marketing (known jointly as non-technological innovations). The product innovation is assumed to be the introduction on the market of a product or service that are new or relevantly improved as to the manner in which they are used or features they possess. Additionally, it does not have to be an innovation for the market[1] and it does not have to be innovation prepared by a given enterprise[2]. Product innovation can be a result of the use of new knowledge and technology or new usage or combination of the existent knowledge and technology. Product innovation in services is about implementing significant improvements in the manner services are rendered, adding new functions or features of existing services or implementing totally new services. The organizational innovation is, as per the research methodology, the implementation of a new organizational method in the principles of operation, organization of the workplace or relation to the surrounding environment, which has not been thus far used in a given company. This type of innovation has to be an effect of a strategic decision undertaken by the directors. Mergers and acquisitions are not classified to this category, even if they were performed for the first time. Marketing innovation is considered to be the implementation of a new marketing concept or marketing strategy that is markedly different from the marketing strategies used so far. It is worth mentioning that these types of innovation do not include seasonal, regular and other changes happening routinely in the scope of marketing strategies (e.g. cutting prices).

5. Analysis of innovativeness of Ukrainian enterprises in 2014-2016 – results

Between 2014 and 2016, the percentage of enterprises, which undertook innovative activities amounted to 18.4%, with 11.8% realizing technological innovations (5.7% product innovations and 10.3% process innovations), non-technological ones included 13.4% (8.7% organizational and 10.2% marketing ones). Longer observations of this statistics points

[1] It has to fulfil the requirement of novelty or marked improvement for a given enterprise.
[2] It may be prepared by other enterprises or institutions.

to positive tendencies, for comparison in 2006 this percentage was 11.2% and in 2011 it was 16.2%.

Analyzing the data, the relation between the size of the enterprise (number of employees) and the realization of innovative activity become visible. Such a dependency is observed also in the case of innovative activity of the enterprises in the economies of other countries. The bigger enterprises have at their disposal bigger human capital, material resources and financing which translates into bigger possibilities of implementing innovation. The biggest percentage of entrepreneurs realizing technological and non-technological innovation is observed in the group of bigger entrepreneurs. Detailed distribution is presented in Table 1.

Table 1.
Innovative activity of Ukrainian enterprises depending on the type of conducted innovation and sizes of enterprises between 2014-2016 (expressed in %)

	Innovative assets	Implementing		
		technological and non-technological innovations	only technological innovations	only non-technological innovations
Total	18.4	6.8	5.0	6.6
small (employing up to 49 people)	14.8	4.9	3.8	6.1
medium (employing from 50 up to 249 people)	24.7	9.8	7.3	7.6
large (employing above 250 people)	39.6	19.9	11.5	8.2

Source: The State Committee of Statistics of Ukraine, (2017). Обстеження інноваційної діяльності в економіці України (за міжнародною методологією), p. 1. Retrived from: http://www.ukrstat.gov.ua/ (2018.07.15).

Another analyzed cross section regarded the type of economic activity. In the Ukraine there is a Classification of Types of Economic Activity (State Classification 2009:2010) compatible with the international classification NaceRev2. In the analyzed period the highest percentage of innovative enterprises was found in the group enterprises in the IT and telecommunication sector (22.1%), processing industry (21.9%), financial and insurance industry (21.7%) and the activity in the architecture and engineering (20.1%). The detailed distribution was presented in figure 2.

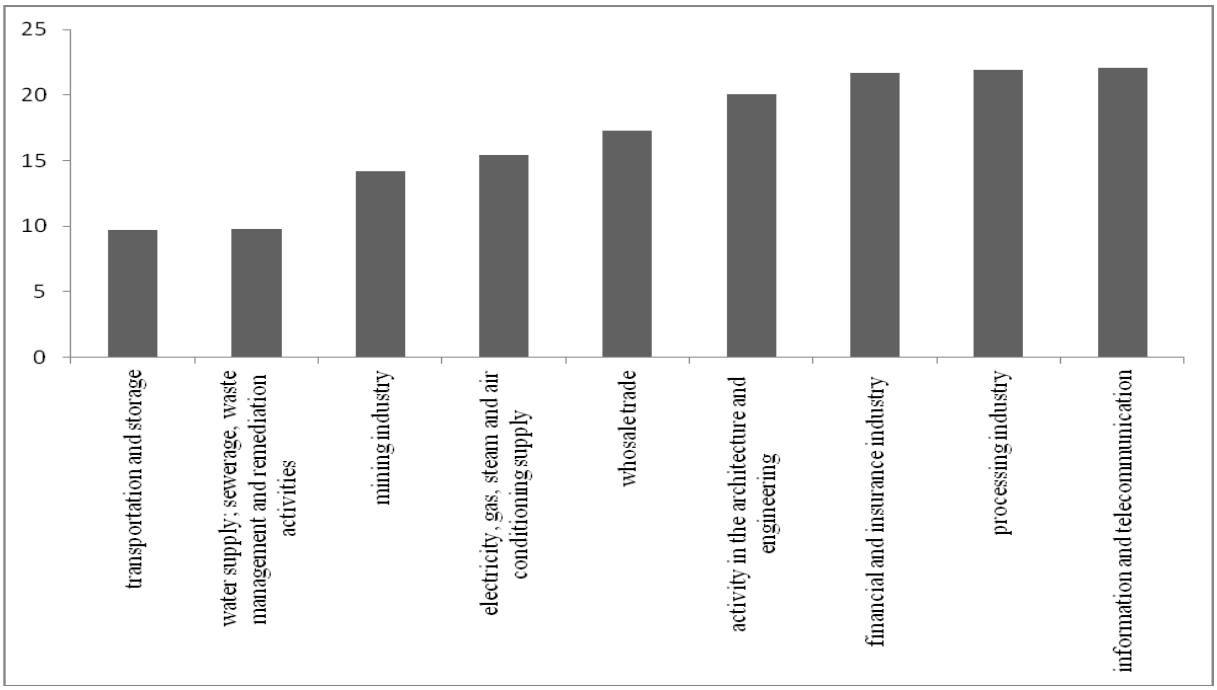

Figure 2. Innovative activity of businesses depending on the type of business activity (State Classification 009:2010) between 2014 and 2016 expressed in % of the total number of examined enterprises from a given type of business activity. Source: The State Committee of Statistics of Ukraine, (2017). Обстеження інноваційної діяльності в економіці України (за міжнародною методологією), p. 2. Retrived from: http://www.ukrstat.gov.ua/ (2018.07.15).

In the Ukraine there is a marked spatial differentiation of innovatively active enterprises (figure 3). The difference between the region (oblast) where the most of innovative active enterprises are located (Rivne, 23.8 %) and a region in which there are the least innovative enterprises (Chernihiv, 9.7%) amounts to 14.1 percentage points. Regional asymmetry in the innovative activity should be related with the fact that in the Rivne, Kharkiv regions and in Kiev there are relatively many multi-sectoral enterprises, having the status of market leaders. For example, in the Kharkiv region there is a public joint stock company Turboatom (established in 1934), competing with such international companies as General Electric or Siemens, employing 5 thousand employees. Another example is the company Mironovsky Hleboproduct with its seat in Kiev, employing over 5 thousand employees, a leading conglomerate in the production of grain and poultry.

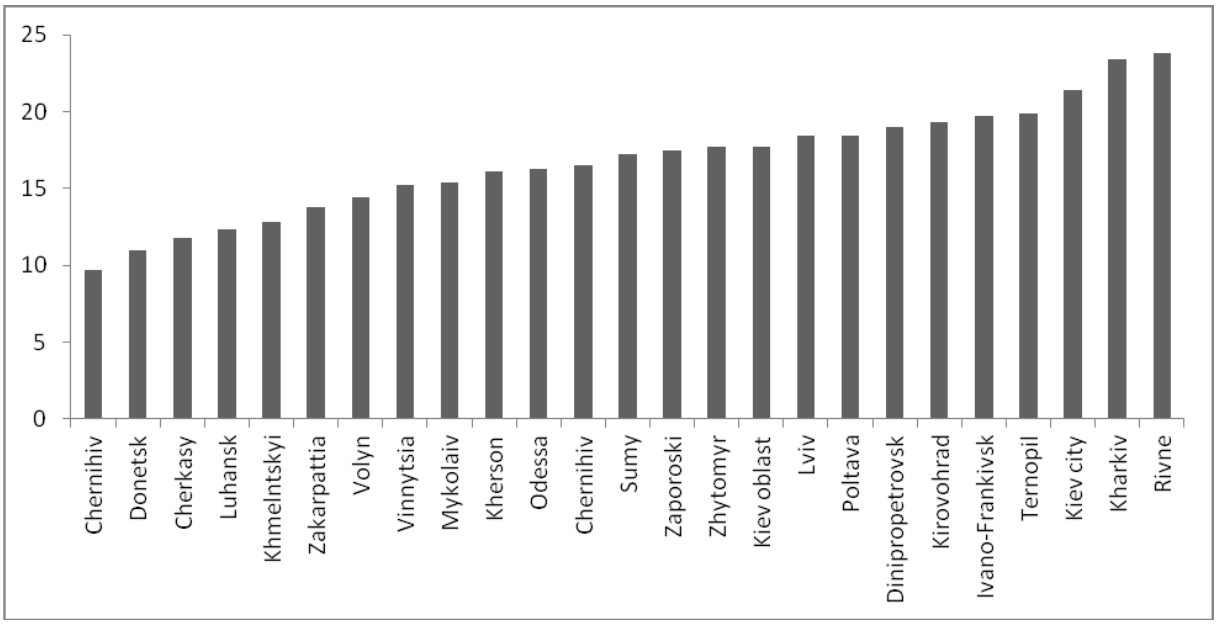

Figure 3. Distribution of enterprises that are active innovators between 2014 and 2016 according to regions (oblasts) in % of all the researched enterprises of a given region. Source: The State Committee of Statistics of Ukraine, (2017). Обстеження інноваційної діяльності в економіці України (за міжнародною методологією), p. 3. Retrived from: http://www.ukrstat.gov.ua/ (2018.07.15).

Implementation of innovation requires financial resources. An important aspect is the funding for product innovation regarding products and processes. The funding includes the purchase of knowledge from outside sources, purchase of software, research and development activity, investment in fixed assets. Over half of the businesses, which implemented technological innovation in the analyzed period of time, purchased machines, equipment and software for the production of new or markedly improved products and services.

In 2016 almost 70% of all funding for innovation was used by the entrepreneurs for the purchase of machines, software, 15% on performing internal science and research and 9.1% for the purchase of external goods and services. In 2016 the expenditure on innovation came from own resources (89.5% of the total value of financing).

Conducting business activity certainly requires cooperation with other market entities – entrepreneurs, science organizations. Actions based on cooperation or even coopetition facilitate diffusion of new ideas and organizational solutions (so-called *spill-over effect*). 34.4% of entrepreneurs undertaking technological innovations in the Ukraine in 2014-2016 cooperated with other businesses and organizations including institutes of higher education and R&D institutions. More often than not these were Ukrainian partners rather than foreign entities. The most important partners for all innovative businesses were the suppliers of devices, materials, components or software (26.1%) and customers or buyers (13.7%). The percentage of businesses, which cooperated with science institutions amounted to 8.4% and 5.9% cooperated with institutes of higher education.

6. Barriers and threats to the development of innovative activity of Ukrainian entrepreneurs

Analyzing the innovativeness of Ukrainian entrepreneurs it is worth paying attention to the barriers, which limit Ukrainian businessmen in this scope. Referring to the results of the study at hand, 83% of businesses that were non-innovative between 2014 and 2016 quoted lack of demand for innovation on the market as the leading cause of their lack of activity in that area, they also gave such reasons as low competitiveness, lack of ideas for innovation, lack of qualified employees, lack of partners for cooperation, lack of success in implementing innovation in previous years. 17%, in turn, believed that the lack of innovative activity is a result of limitations in the form of lack of financial resources (own or external), costs related to innovative activities, lack of qualified employees, lack of partners for cooperation, burdens of the tax law, difficulty in receiving aid from the state (support) or subsidies for innovation.

Three final limitations reflect well the climate towards innovativeness in the Ukraine. As shown earlier, a serious problem making it difficult not only to develop innovation but entrepreneurship in general in the Ukraine is the phony-declarative attitudes of the Ukrainian authorities towards changes in this respect. As described by Iwan Kulczycki (http://www.polukr.net/…) – deputy director of the Lviv State Centre of Science, Innovations and Informatization and the president of the Agency of European Innovations in the Ukraine: "there is a need for real activity and not declarations". In the Ukraine there are no systemic initiatives – there is no institutional support to develop innovative activity and mechanisms allowing to implement innovation and creating real possibilities for cooperation of business and science.

Certain threats are related also to the employee potential, which is an important factor contributing to the development of innovative activity. According to the survey conducted in the beginning of 2018 by the Kiev International Institute of Sociology, over 37% of Ukrainians want to emigrate with 40% of respondents being university graduates (https://www.obserwatorfinansowy.pl/…). In the Ukraine according to the data of the International Fund for Educational Policy Research and State Statistical Service the average pay of scientific employees oscillate between 100 to 300$. It is estimated that in relation to low pay, every year 6000 to 9000 Ukrainians constituting intellectual elites leave their homeland (https://www.forbes.com/…). Only in 2014, the National Academy of Science of Ukraine lost 2600 employees including 800 professors and 511 PhDs. 80% of Ukrainian employees of institutes of higher education are close to the retirement age (http://forbes.net.ua). Additional risk for the Ukrainian economy is the emigration of students to foreign Universities, who will probably not come back after their studies.

7. Conclusions

The article presented data regarding the innovativeness of Ukrainian entrepreneurs between 2014 and 2016 coming from the Ukrainian Statistics based on the international methodological CIS standard. The study of innovation based on this methodological standard is conducted not only in the EU member states, but also in countries which are seeking accession as well as those associated with the European Union. This type of studies was introduced in the Ukraine to the programme of official statistical research relatively recently, in 2010. This was relevant both for the Ukraine (in the context of the conducted national development policy and regional policies) as well as for international organizations for which measuring the innovativeness according to a standardized methodology makes it possible to compare the development of these phenomena in space and time.

The article presents data regarding the innovative activity of entrepreneurs, type of innovation, diversity of activity depending on the size of the enterprise, type of activity, location, as well as the funding of the innovative activity and cooperation in introducing innovative activities. The quoted statistical papers are hard to uniformly evaluate due to the lack of possibility to compare them to the data from the previous round of survey. Whereas, the direct comparison to the economies of other European countries would not be relevant due to the difference in economic and social potential. It is worth pointing out however that the data analysis reveals similar dependencies as in other European countries: scale of innovative activities significantly depending on the size of the enterprise, big differentiation of innovation activity from business type and spatial diversifications.

Innovations are one of the key instruments of system change and economic development (Baruk, 1997). For economies in way of transitions, like Ukrainian, the increase of the innovativeness of enterprises is in the interest of not only the enterprises themselves, but also, and perhaps above all, state authorities. The way of knowledge and innovation-based development in Ukraine require really supporting state policy in regulative, institutional, as well as financial dimension.

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