

IMPACT OF HIGHLY QUALIFIED PERSONNELS MIGRATION ON ECONOMIC AND INNOVATIVE DEVELOPMENT

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Abstract

Liberalization and rationalization are the *main factors* that favor the modification of migration processes and the growth of relevant migration indicators. Factors that determine the global migration movement can also be attributed to the expansion and acquisition of a mass of technologies that aim at reducing the sense of distance, which allow you to quickly and quickly change locations of stay, without changing the conditions and principles of work, contact audiences, etc. It is in this context that *the focus* of research on migration processes in general, and those areas where small changes in which, can potentially have a significant impact on the economic situation and further development, including innovation, becomes relevant. *The hypothesis* of investigation is the migration of highly skilled personnel exerts a set of influences on the economic and innovative development of the recipient country and the donor country. Applied analytical *methods*, comparative analysis, classification, allow to achieve the aim. The authors grouped the main indicators of the migration processes impact on the countries of departure (donor countries) and those leaving (recipient countries) in terms of economic and innovation component. The analysis presents *the results* in qualitative and quantitative terms. The IT market is analyzed, indicators of its development are given, and major trends are identified, including in comparison with the world ones. The peculiarities of migration processes of specialists in this field are described. As *implications*, it is proposed to include the migration of highly skilled workforce in the assessment indicators Country Innovation Index.

Keywords: migration, innovative development, economic development, IT, highly qualified personnel.

Introduction

long with the powerful development of information technology and innovative processes, humanity is increasingly focused on the constant search for ways to improve their lives. The processes of globalization and internationalization cause a change in the vector of international activity and cooperation, where they open a wider space for the movement of labor between regions,

countries and continents. Thus, labor mobility makes the analysis relevant of a wide range of economic, socio-demographic, political and technological changes in the recent period.

With the processes of deepening of innovative development and economic transformation, more and more formation of life of society in general, and of each individual in particular, becomes evident, which becomes tangible in work processes, private life, public and spiritual sphere, etc (Ginevičius et al., 2018).

Along with the powerful development of information technology and innovative processes, humanity is increasingly focused on the constant search for ways to improve their lives. Thus, liberalization and rationalization are the main factors that favor the modification of migration processes and the growth of relevant migration indicators. Factors that determine the global migration movement can also be attributed to the expansion and acquisition of a mass of technologies that aim at reducing the sense of distance, which allow you to quickly and quickly change locations of stay, without changing the conditions and principles of work, contact audiences, etc (Čajka et al., 2018).

The aim of the article is to investigate the main factors and directions of influence that carry out the migration processes of highly skilled specialists on the countries economic and innovative development (the example of the IT industry). According to the aim of this article it was suggested to explore the latest research in the field, which is presented by the Literature Review.

In order to study global processes, the structure of the migrant's distribution is presented in accordance with the total population in percentage terms by continents. The factors that influence the increasing trend of increasing the number of highly skilled labor migrants from Ukraine are analyzed. The authors analyzed ranking of Ukraine, that characterize it's state of socio-economic development, which causes an increase in the migration activity of highly qualified personnel in particular. It is determined that Global Innovation Index, Ease of doing business index, Sustainable Society Index (Human, Economic, Environmental Wellbeing), The Global Peace Index, Index of Economic Freedom, Index of Happiness are the main indicators that shape the above factors. Thus, in the course of the study these indicators were analyzed, and the Ukraine place was determined according to them in the overall rating. It was Compared the Global Innovation Index of Ukraine with other countries that are recipient countries for Ukrainian IT professionals, and it was analyzed the structure of the Summary Innovation Index, which is formed annually for European countries.

The prospect of further research may be quantitative determination of the migration processes influence on the state of countries economic and innovative development, forecasting and economic-mathematical modeling of changes in the country's economic development in changing or maintaining migration trends, factor analysis of the impact of highly qualified personnel migration on economic development.

Literature Review

It is in this context that the focus of research on migration processes in general, and in particular those areas where small changes in which, can potentially have a significant impact on the economic situation and further development, including innovation, becomes relevant (Filipishyna et al., 2018).

Particularly noteworthy is the type of migration that is encouraging from the point of view of the host countries, since they are making some efforts to promote, simplify procedures and encourage migration (Piekutowska et al., 2018). This type of migration includes the migration of highly skilled labor. These cadres shape the potential of countries for further economic and innovation development, as they often have higher education, special skills and professional skills in their field (Churilova et al., 2019). The sphere, which is closely connected with the innovative development and gives the basis for the economic development of the country, declares it on the territory of the world space is the sphere of Information technologies. The highly qualified personnel employed in this field is one of the driving forces for the future development (Belas et al., 2018). At the same time, the innovation growth is related form the level of creative development which proved by the authors in the paper (Bilan et al., 2019e).

With this in mind, it is relevant to study migration issues among highly qualified IT industry professionals in the case of Ukraine and the corresponding impact on the country's economy, in detailing the aspects of the relationship of this particular type of migration with economic indicators and innovation potential.

The main indicators which influence macroeconomic stability, the marketing factors of the country's competitive advantages are allocated in the papers (Lyulov et al., 2018; Ivanová et al., 2018; Bilan et al., 2019c; 2019f); the role and influence of economic freedom on macroeconomic stability were analyzed by the scientists in the paper (Yevdokimov et al., 2018). The authors in the paper (Vasilyeva et al., 2019; Djalilov et al., 2015) proved that dynamics of bifurcation transformations in the transition economy influenced on the temp of the innovation development.

The analysis of the impact of innovative enterprises activity on ensuring the indicators of state development is analyzed in the work of Zakharkina et al. (2018), Kondratiuk-Nierodzińska (2016).

Prediction of the most obvious indicators of loss of intellectual capacity of the country on the basis of analysis of socio-economic impact of intellectual potential of young people on economic and human development is made in the papers (Pryima et al., 2018; Mishchuk et al., 2019; Koceva, 2019; Lyeonov et al., 2016; GrenÄkovÄ et al., 2019; Petrushenko et al., 2014; Shvindina, 2019).

The importance of values of young employees, researches on labor migration are laid down in the papers of Titko et al., (2020), Romanska (2017), Zholkver (2019), Garden (2019).

Besides, the range of the scientists (Bilan et al., 2019d) analysed the level of trust among business and government as an indicator which influenced on the economic and innovation development of the country.

The role of highly qualified personnel in forming relationships with stakeholders as part of economic and social development is examined in the papers (Syhyda, 2013; Bilan et al., 2018; 2019b; Abaas et al., 2018). The migration of highly skilled personnel exerts a set of influences on the economic and innovative development of the recipient country and the donor country.

Methods

It was applied analytical methods that were showed by graphical method of trend analysis and descriptive approach. Also, it was used comparative analysis, structural analysis of classification features, allow to achieve the aim of research migration impact on different areas of country management.

The database of the article was formed by studies of leading world scientists, official and statistical information of national and international organizations, such as Ministry of Finance of Ukraine, the World Bank, Department of Economic and Social Affairs of United Nations, the World Intellectual Property Organization (WIPO, a specialized agency of the United Nations) and Cornell University, INSEAD.

Also the methodical approach in this study is based on an analysis of results interviewing directly IT specialists and IT companies that was taken by the all-Ukrainian forum www.dou.ua (DOU: The community of programmers, 2019).

Results

With the advent of the 21st century, the international environment has been radically changing in which states act as key players in the modern paradigm of the common market, according to which the international economy is not a direct interaction of the national government with other national governments, but an economic (not political) interaction between the regional economic communities (Barnz V. and Lebedur L., 2003).

Thus, a new approach to international internationalization becomes a relevant issue for consideration by politicians, scientists and practitioners. Globalization processes necessitate the study and modification of approaches to the role and place of civil society institutions in the field of regulation of labor processes and employment of the population, infrastructure development of national and regional labor markets (Yevdokimov et al., 2018; Lyulyov et al., 2017). Hence, employment processes cause a steady increase in global migration rates and reallocation of the labor force in both global and national and regional labor markets (Garden et al., 2019). The main factors that currently affect rethinking of approaches to migration processes are the scientific and technological progress, world market, the constant change of market specialization, changes in the structure of social and labor potential, as well as geopolitical and geocultural processes (Bilan Yu et al., 2019b).

There are many kinds and forms of migrations. In studying the conditions that encourage people to leave their country. In addition, the establishment of classification has a great influence theoretical school, according to the principles which the scientist makes their hypothesis.

Migration processes in its essence are subject to classification on a large number of factors.

The generally recognized classification of migration is the distribution by qualitative feature, namely, migration originates from the country under consideration or into it, immigration and emigration accordingly are distinguished. In most cases, migration is divided into internal and external on the grounds of crossing the state border. In addition, there is a breakdown by kinds and type of migration by such features as: distance, duration, nature of the organization, purpose, reasons, scale, etc. Steven Castles, director of the Oxford University Refugee Study Center, among the total number of migrants distinguish such group as highly skilled business migrants (Stephen Castles, 2008). These are high-level managers, administrators, specialists, technicians and those who move within the internal labor markets of multinational corporations and organizations, or those who are seeking employment through international labor markets. This group of migrants is in demand in most countries, which leads to offers for special programs of the type "Highly skilled and business migrants" (Kasianova, 2016).

Thus, comparing highly skilled labor in migration processes with other types, it should be emphasized that this group has certain special characteristics, namely:

- these migrants are in most cases highly educated and focused on lifelong learning;
- in most cases, migrants aim to leave the donor country forever without plans to return;
- migrants are in demand both in the donor and recipient countries;
- this type of migrant fully comply with migration laws and are responsible citizens;
- they often migrate with their families;
- this type of migration is due to particular reasons where people seek not only higher wages but also in a common vision of a better standard of living and security.

It is impossible to consider individual types of migration and their impact on the economy and innovation without understanding the overall structure of migration processes. Thus, according World Migration Report 2020 of International Organization for Migration the number of international migrants globally in 2019: 272 million (3.5% of the world's population) and 74 per cent of all international migrants were of working age (20–64 years) (Khadria et al., 2020).

Considering the number of migrants in recent years according to the division into parts of the world (Fig. 1) provided by the United Nations Department of Economic and Social Affairs, we can say that on average, every 10th European is a migrant, and Ukraine is not an exception (United Nations, 2020).

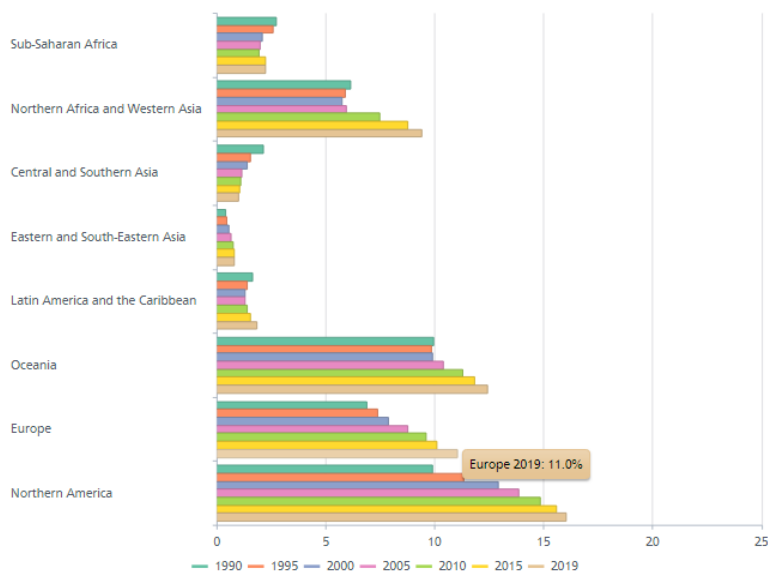


Fig. 1. International migrants as a percentage of total population by major area of destination
Source: United Nations, 2020

Ukraine is the largest European country in terms of area, so any changes in the absolute values of migration indicators in Ukraine are immediately reflected in the analysis of all European countries (Pimonenko et al., 2018). Despite the fact that an indicator of the number of migrating Ukrainians tends to decline (Fig. 2), according to the Department of Economic and Social Affairs Population of United Nations Ukraine is among the world's Top 20 countries, whose population migrates. For example, in 2019, the number of such citizens of Ukraine was 5.9 million. It is interesting to note that along with Ukraine in this list are such countries as the United Kingdom, Germany, the USA, Poland, Italy, for which Ukraine is a donor of labor migrants (United Nations, 2020).

So, in 2019 Ukraine ranked 8th in absolute terms of migrant donor countries (Fig. 2). But if you analyze this graph in more detail, it should be said that most of the countries that precede Ukraine are much larger in area and population (India, Mexico, China, Russia, Pakistan), Bangladesh, smaller in area but overall population is still more than the population of Ukraine (more than three times), only Syria is smaller than Ukraine in terms of area and population.

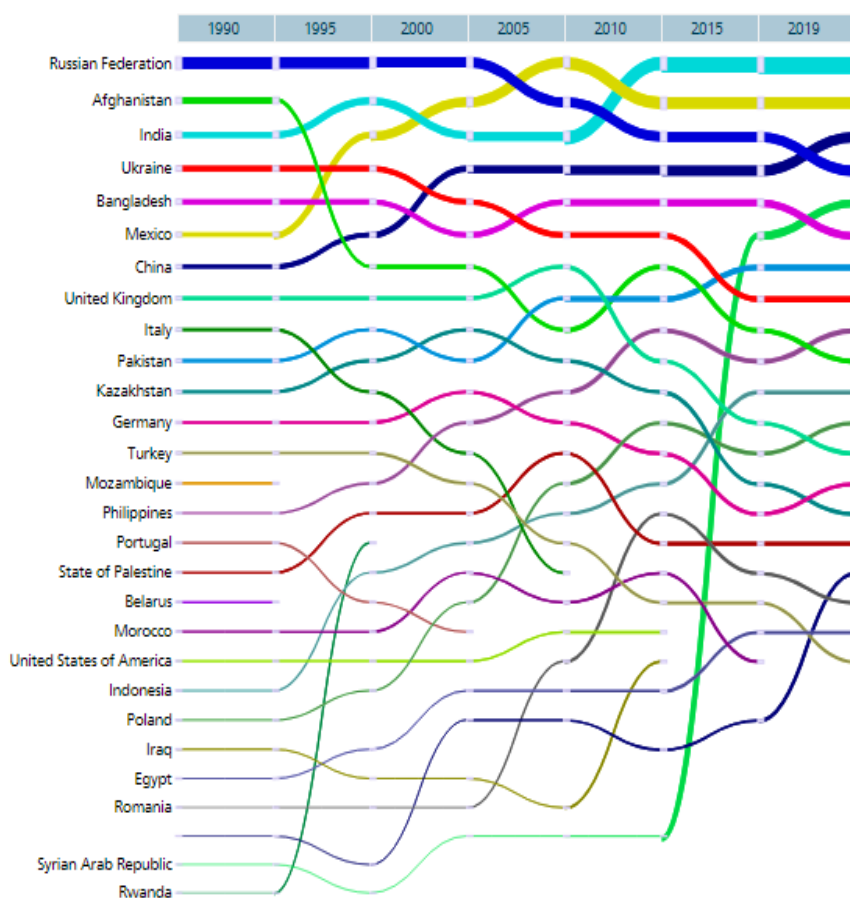


Fig. 2. Twenty countries or areas of origin with the largest diaspora populations (millions)
Source: United Nations, 2020.

But it is obvious that such a rapid jump in the number of emigrants is due to the difficult geopolitical situation and aggravation of the military conflict. Therefore, it can be argued that among the countries whose population size and area are approximately equal in indices, Ukraine occupies a leading position as a migrant donor country. The current situation actualizes the issue of migration research in Ukraine: cause and effect, alternative opportunities and threats, which carries outflow of population from the territory of Ukraine (Vdovtsova, 2019; Bilan et al., 2011; Nur-Al-Ahad et al., 2019). The current situation actualizes the issue of migration research in Ukraine: causes and effects, alternative opportunities and threats, which outflow of population from the territory of Ukraine is fraught with (Naghshpour et al., 2019).

To study the impact of migration on the country's economic growth, let us research the IT industry, which is one of its driving forces.

IT industry today is very attractive for young people, the reason is primarily high income, because most contracts are funded by the investments outside the state. Also, the industry is characterized by a constant change and improvement of technology, knowledge, skills of its employees, and their compliance with international standards and requirements (Nemanja et al., 2019). On the one hand, this progressiveness is a positive factor for Ukraine in general, as it contributes to the development of innovation in the country, as well as reaching level of developed countries in the field of intellectual labor potential. Experienced IT industry personnel play the part in attracting foreign investments, creating companies and opening branches with internationally raised capital in Ukraine.

The ranking of the 10 largest IT enterprises in Ukraine by number of employees is shown in Table 1.

Table 1: top 10 largest IT companies in Ukraine (as of July 2019)

Place in rating	The company name	Cities where the company's offices are located	Specialists in Ukraine, number of people	Increase in six months (January 2019 - July 2019)	Technicians, number of people
1	EPAM	Kyiv, Kharkiv, Lviv, Dnipro, Vinnytsia	7500	+900	6700
2	SoftServe	Kyiv, Kharkiv, Lviv, Dnipro, Exactly, Chernivtsi, Ivano-Frankivsk	7082	+749	5780
3	GlobalLogic	Kiev, Kharkiv, Lviv, Mykolaiv	4363	+214	4071
4	Luxoft	Kiev, Dnipro, Odessa	3670	-250	3598
5	Cycle	Kiev, Kharkiv, Lviv, Dnipro, Odessa, Vinnytsia	2867	+4	2506
6	NIX	Kharkiv	2004	+301	1794
7	Infopulse	Kyiv, Kharkiv, Lviv, Odessa, Vinnytsia, Zhytomyr, Chernihiv	1900	+49	1681
8	Intellias	Kyiv, Kharkiv, Lviv, Odessa, Ivano-Frankivsk	1521	+301	1233
9	DataArt	Kiev, Kharkiv, Lviv, Dnipro, Odessa, Kherson	1474	+173	1278
10	ZONE3000	Kharkiv, Lviv, Dnipro	1450	+150	392

Source: DOU: The programming community, 2019

Market size of the IT industry is an important economic indicator. It shows how much information technology is developed in the country compared to other countries. Thus, proof of the development of the IT market is a positive trend in absolute and relative terms of the total number of technicians engaged in major IT –companies of Ukraine (Fig. 3).

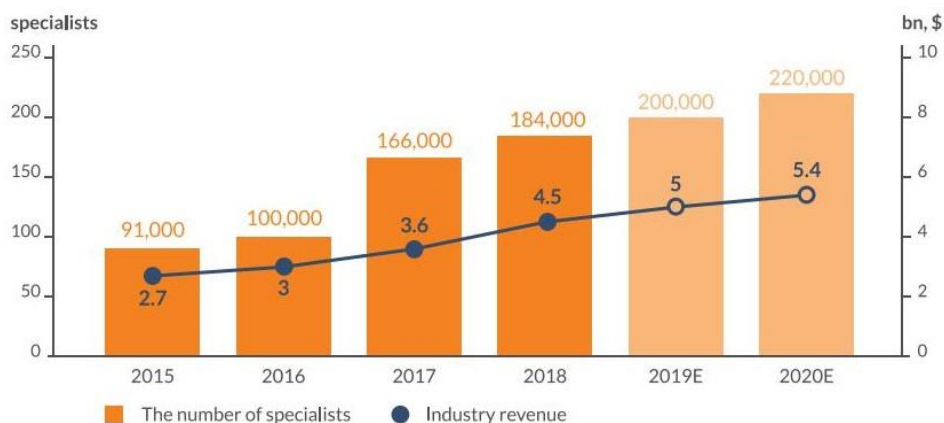


Fig. 3. Market growth and number of IT specialists in Ukraine (2015-2020)

Source: N-iX, 2019

Despite the significant growth of the IT industry in Ukraine, the level of migration among representatives of the IT professions continues to increase. Thus, according to Julia Ruda, 2018 nearly every other representative of the profession thinks about leaving abroad. Destination countries include Poland, Germany, and the United States. The proportion of people considering returning is extremely low and is less than 5%.

Experienced and highly qualified personnel who have knowledge, experience and skills at the level of specialists of developed countries can leave the country and migrate to other countries where the standard of living is higher (Fig. 4).

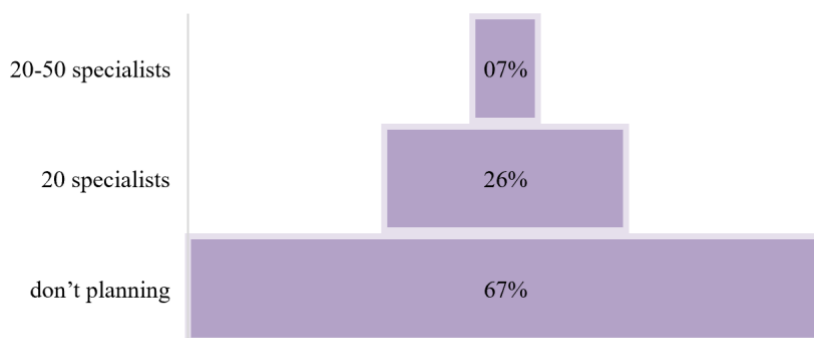


Fig. 4. Plans for relocation of specialists outside Ukraine in the largest 50 IT companies in Ukraine
Source: developed on DOU: The community of programmers, 2018.

Ukraine's current internal IT market is growing much faster than in other countries. In 2016, overall growth was 22% (while developed markets in the world are growing no more than 5% per year) 3, in 2017 - 27% 4. Today, the IT industry accounts for over 3% of Ukraine's GDP (US \$ 5 billion), along with the agrarian sector (US \$ 17 billion) and metallurgy (US \$ 14.3 billion) (Karpenko, 2018).

In the ranking of the level of spending on the IT sector and depending of economic development on this level, the state ranks one of the last places among the countries with the IT sector (\$ 32.2 GDP per capita, according to 2015 data). The development of the domestic IT market shows one-sided trends (Rollnik-Sadowska et al., 2018). The low level of IT consumption in Ukraine is at the same time the consequence and the cause of the low level of well-being of citizens (it is the raw material and not the technological basis of the economy that causes the lagging behind developed countries) (Garden et al., 2019; Zakharkina et al., 2018). Domestic IT market is US \$ 1.1 billion - against US \$ 3 billion in India and US \$ 7.1 billion in the UK. And it is not about the production of hardware or the creation of packaged software, but only one segment - outsourcing.

In the IT services export market, Ukraine is now 5 times more modest than Poland (\$ 3.2 billion versus \$ 16.3 billion). If you look at the overall IT market of Ukraine, it grows across all three segments: the hardware market; packaged software market; services market (Ivanová et al., 2018).

The all-Ukrainian forum www.dou.ua (DOU: The community of programmers, 2018) constantly conducts research into the market of IT-specialists, most often by interviewing directly specialists in this field and companies representing the industry. Yes, a survey was conducted among IT professionals who moved abroad and were willing to share their experiences of moving and living in another country. The study surveyed IT professionals who migrated to countries such as Poland, Germany, the United States, the Netherlands, the United Kingdom, and Canada, and analyzed the situation separately. To include other countries in the analysis, they were combined into regions: Western Europe (including Scandinavia and the British Isles), Central Europe (including the former Yugoslavia), the Baltic States and the former USSR. There were also responses from Asia, Australia, New Zealand, South America and Africa, but too few to analyze even at the regional level, so these responses are only included in the sample as a whole.

Thus, according to the results of the study, the following results were obtained regarding the country to which the interviewed IT specialists migrated (Fig. 5).

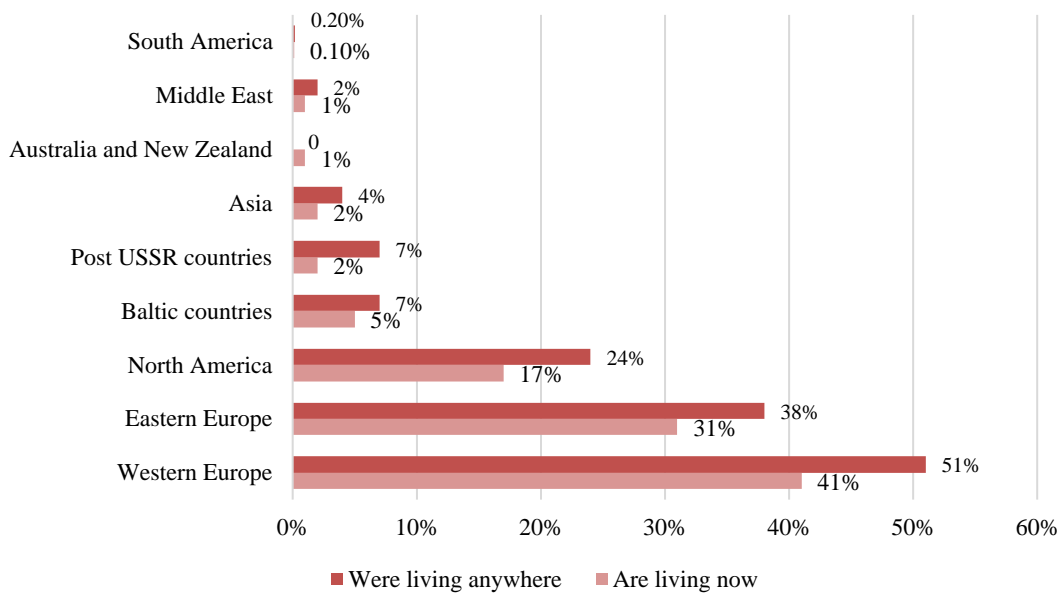


Fig. 5. Distribution structure of regions of the countries to which the Ukrainian IT specialists migrate
 Source: developed on DOU: The community of programmers, 2018.

It is safe to say that most of the migrants from Ukraine who are employed in this field are highly qualified IT specialists, that is, at the time of departure they already have experience working directly on the industry profile, which is shown in Figure 6.

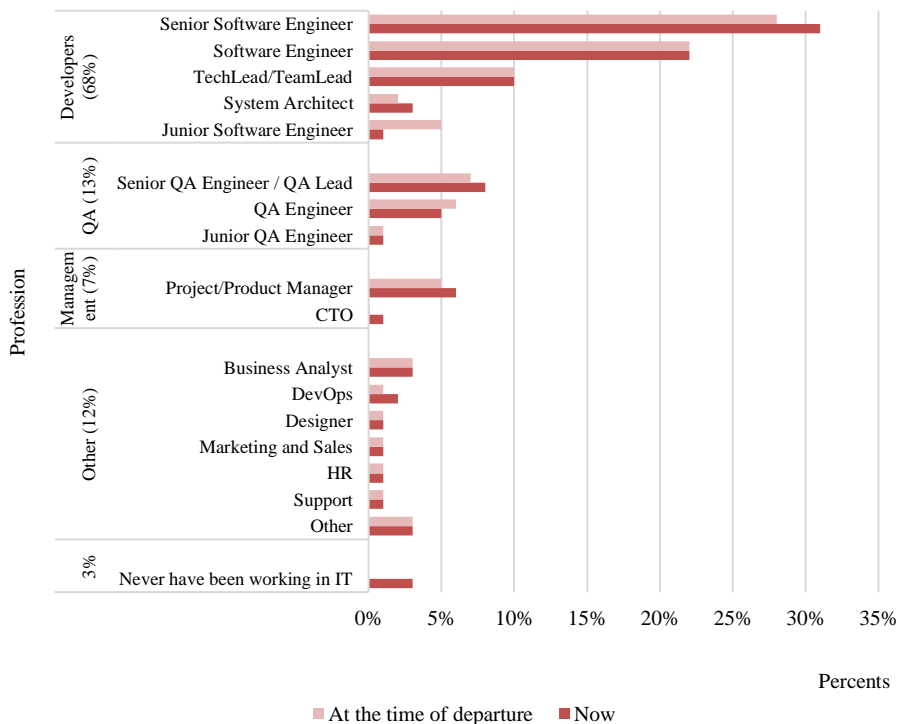


Fig. 6. Results of the interviewing IT professionals who migrated regarding professional orientation at the time of departure and at the time of the survey
 Source: developed on DOU: The community of programmers, 2018

The age of the departed is an almost perfect histogram with a peak of 31.5 years now and 29 years at the time of departure (Fig. 7).

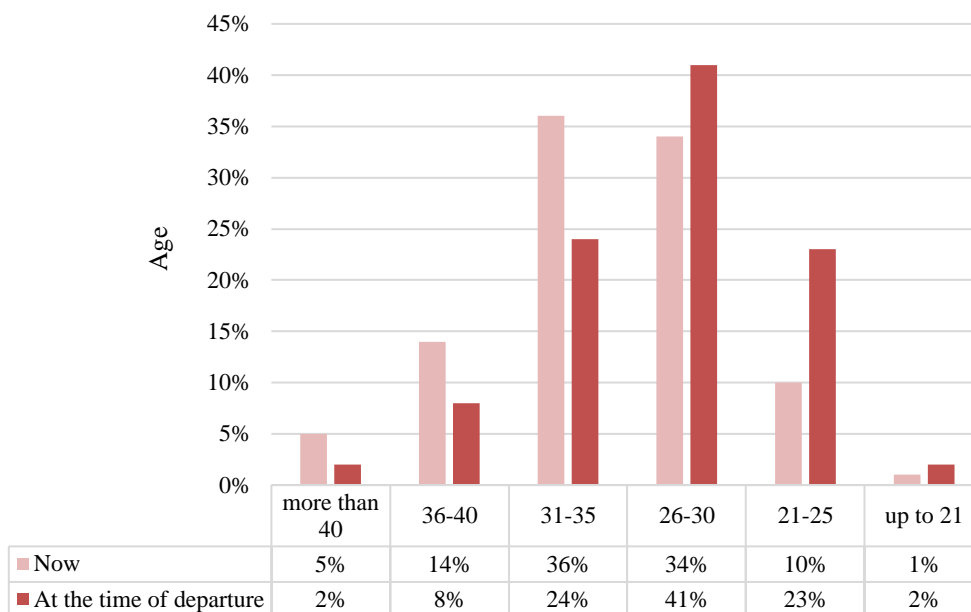


Fig. 7. Distribution of age structure of migrant IT professionals according to the survey
Source: developed on DOU: The community of programmers, 2018.

Another factor that must be considered analyzing migration trends of highly qualified specialists from Ukraine IT industry is that they do not go alone, but with their families (more than 40%), which respectively increased the total number of migrants (Dmytrów et al., 2019). This fact also indicates that these professionals do not transfer money into the home country, do not pay taxes, which means they in no way take part in the formation of GDP as a result of their departure. Also, family migration reduces the likelihood of their return to the country from which they migrated in the future (Limosani et al., 2017).

The main feature that distinguishes representatives of the IT sector from other migrant workers is financial capacity (Titko et al., 2020). Among the first reasons for the departure of specialists are not income, but the quality of living environment (education, health care) (Domina et al., 2018), the prospects for company development, as well as access to another culture, the opportunity to learn about other countries (Fig. 9).

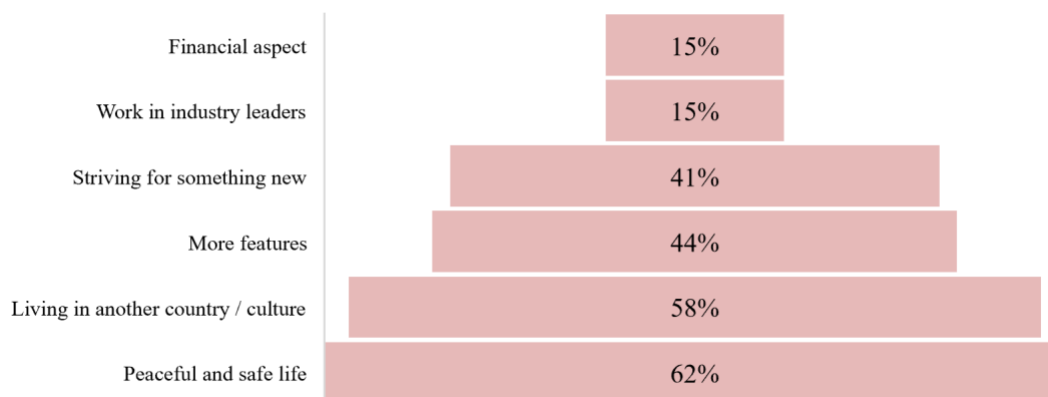


Fig. 8. Reasons for IT professionals to move
Source: developed on DOU: The community of programmers, 2018.

The living environment consists of many indicators that complement each other and form a holistic picture of living standards. The most significant of these indicators are the Global Innovation Index, Ease of doing business index, Sustainable Society Index (Human, Economic, Environmental Wellbeing), The Global Peace Index, Economic Freedom Index, Happiness Index (Fig. 9).

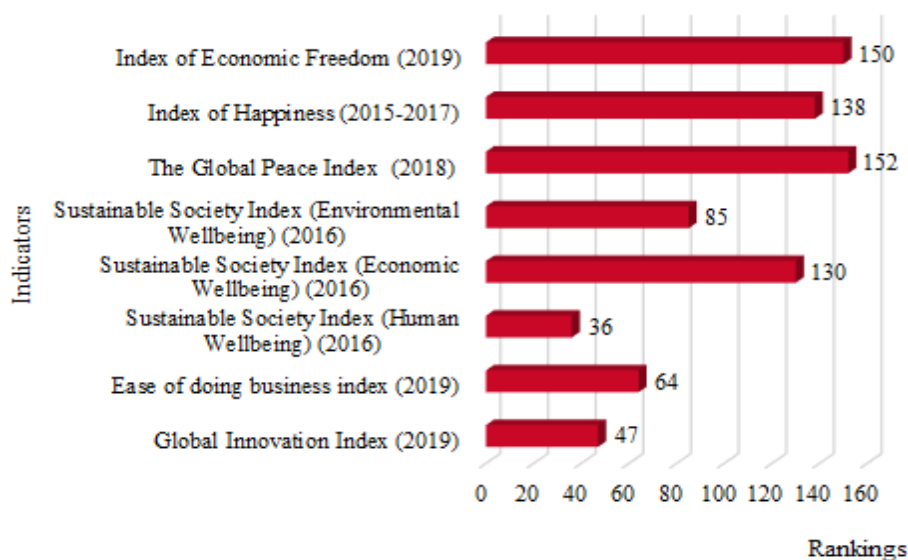


Fig. 9. Ukraine in the international indices in 2016-2019 (Ivanová E et al., 2019)

Thus, according to (Global Innovation Index, 2019) the Global Innovation Index, Ukraine ranked 47th in 2019, while in 2018, 2017 and 2016, the figure was 43, 50, 56, which indicates an overall positive trend. However, the countries visited by Ukrainian specialists have a much higher position in the Global Innovation Index ranking:

- 1) 2019: Poland – 39, United States of America – 3, Germany – 9;
- 2) 2018: Poland – 39, United States of America – 6, Germany – 9;
- 3) 2017: Poland – 38, United States of America – 4, Germany – 9;
- 4) 2016: Poland – 39, United States of America – 3, Germany – 10.

The ease of doing business rankings based on the average of each economy's ease of doing business scores for the 10 topics included in the aggregate ranking. For the economies for which the data cover two cities, scores are a population-weighted average for the two cities. A positive change indicates an improvement in the score between 2016/17 and 2017/18 (and therefore an improvement in the overall business environment as measured by Doing Business), while a negative change indicates a deterioration and a 0.00 indicates no change in the score (Koceva, 2019). In 2018, Ukraine ranked 71st (ranking = 68.25, change +0.94), in 2019 – 64 (ranking = 70.2, change +1.95). At the same time Poland ranked 40th (ranking = 76.9, change - 0.5), Germany - 22 (ranking = 79.3, change +0.4), USA – 6 (ranking = 83.6, change +0.4).

By the Economic Freedom Index, based on the calculation of 12 factors that characterize the rule of law (property rights, judicial efficiency and government integrity); the level of government intervention (tax burden, government spending and fiscal health); the effectiveness of regulation (business freedom, freedom of work and monetary freedom); openness of the market (freedom of trade, freedom of investment and financial freedom) Ukraine ranked 147th in 2019 and 150th in 2018, respectively, among 186 countries for which this indicator is calculated (with only 180 fully rated). This indicates that it is difficult for professionals to achieve company success through government policy, the imperfection of the judiciary, the legal system, etc.

The corresponding tendency is characteristic of Ukraine according to the majority of the analyzed indicators, which confirms the fact of dissatisfaction with the quality of life by highly qualified specialists of the IT sector.

In the general context of migration processes, it can be said that increasing labor mobility contributes to the economic development of the world, because it enables more efficient allocation of labor and economic resources (Koceva, 2019). But in fact, the economic effects of international migration may differ from theoretical expectations, due to a number of factors for both donor and host countries (Mikhaylova et al., 2019).

The migration of highly skilled professionals is one of the key factors in the redistribution of goods. Information and people are key resources for value creation. Studies conducted on the impact of migration on the performance of the economy (Koceva, 2019; Titko et al., 2020, Balkytė et al., 2011; Mishchuk et al., 2019; Kondratiuk-Nierodzińska, 2016; Lyulyov O. et al., 2018) allow us to understand the relationship between migration processes and economic development. However, a number of issues need further investigation (Bombiak, 2019). Namely, the impact of large-scale migration on the economic growth of the donor country and the recipient country. In order to understand this issue, it is advisable to identify the positive and negative aspects of the migration processes of highly qualified personnel for donor and recipient countries. The study will be carried out on the example of information technology.

From the perspective of the donor country. The outflow of highly skilled IT professionals in the country has one of the consequences a slowdown in the development or recession of science-based and high-tech areas, which in its turn has global implications that go beyond the individual sectors of the country's economy (Palienko et al., 2018). Consider the mechanism of this process. Migration of top IT professionals abroad (and there is no doubt that a significant proportion of those leaving the IT industry in donor country belong to this category, given the prospect of competing in highly competitive markets), leads to reduced competition in the domestic market. On the one hand, it contributes to the reduction of unemployment in the industry and promotes the recruitment of new specialists, which is a positive indicator (Kačerová, 2016). However, on the other hand, it reduces the level of competition among the best professionals in the industry. That is, there is a phenomenon where the attractiveness of the industry is increasing for newcomers, but there is a shortage of personnel among high-level professionals. The consequence is a reduction in the potential of the industry as a whole. In its turn, the decline in the industry's potential is reflected in the performance of the companies that form the industry and their market positioning. This can be traced at the structural changes (Serebryakova et al., 2018). The share of outsourced IT companies (to a large extent, supporting the activities of powerful international IT companies) and niche companies is growing. In addition, a significant portion of the industry's output is export-oriented, which also has two aspects: a positive one – foreign currency flows into the country's economy - and a negative one - an industry product aimed at developing high value-added industries overseas rather than domestically (Karabasevic D., 2018). The activity of freelancers is also characterized by these aspects. This affects the state of science-based and high-tech sectors of the country's economy, which are gradually losing competitiveness (Ministry of Finance of Ukraine, 2020). As a result, at the macroeconomic level, import of science-based and high-tech products increases and their export decreases. The next link in the chain reaction is the relocation of investment resources to less science-based industries, and as a result to the production of lower value-added products. The minimization of high-tech cost component in the business model guides business structures (enterprises) along the trajectory of movement from process to primary industries (Tommaso, 2018, 2019). The global consequences of migration of highly skilled workers is a decrease in the share of high value-added industries and an increase in exports of raw materials, as a result, the country's economy functions as a raw-material and forms a typical economic model of a "third world country" (Djoemadi Faizal Rochmad, Setiawan M., Noermijati N., Irawanto D. W., 2019; Papp et al., 2019).

However, flow of foreign currency earnings from emigrants (to relatives and family) into the country is considered as a positive effect of large-scale migration, despite their considerable volume, these funds are directed mainly to consumption and do not solve the problems caused by labor migration.

Consider the importance of migration processes among the economically active population for the donor country. In terms of economic development, one of the benefits of labor migration is the infusion of currency (Afanasiev et al., 2019).

For example, according to various estimates, such revenues in Ukraine are from \$ 1 to \$ 5 billion every year. According to the Ministry of Finance of Ukraine, 2020, in 2016 private money transfers amounted to \$ 7.5 billion or 7.9% of GDP, of which 20% came through informal channels, in

2017 \$ 9.3 billion came to Ukraine (6% of GDP), in 2018 it was up to \$ 11.1 billion. In 2019 – 8.7 billion dollars (6% of GDP), of which almost 50% arrived through informal channels. In 2016, most transfers were made from Poland, Russia, the USA (Fig. 10), but in 2019 the situation was changing towards an increase in receipts from the Czech Republic, Italy and a decrease in foreign currency inflows from the USA and Russia.

Accordingly, these receipts help to improve the competitiveness of the country's economy, but only in the context of individual industry markets (Golovchanskaya et al., 2018). Particularly it can be applied to the production of goods and the provision of services, the need for which migrant workers themselves declare in the implementation of migratory capital funds (Šanda et al., 2018). In Ukraine, these are mainly basic necessities, health care services, education, transport and more. In recent years, the real estate market (secondary and primary) has become quite significant in this regard, where migrant workers not only implement the acquired capital but also invest into extensive development of other related industries (Chocholatá et al., 2018). Matthias Benz and Robert Kirchner (Zholkver, 2019) state that their families' money is spent, in particular, on consumption (31.7%), construction or purchase of housing (19.4%), health treatment (8.7%), health treatment of children (6.9 %). Thus, according to the expert, Ukrainian labor migrants, although working abroad, still contribute to the growth of domestic consumption, which benefits the domestic economy, but do not significantly increase the investment aimed at the production of goods with high added value, and consequently, do not solve the problems caused by labor migration.

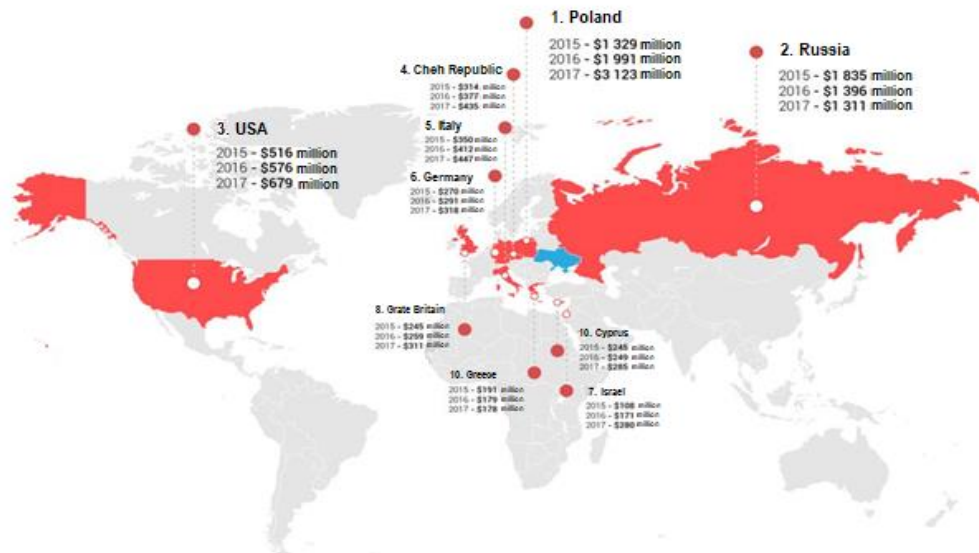


Fig. 10. Amounts of receipts into Ukraine from other countries in 2015-2017
Source: developed on RBC-Ukraine, 2018

From the position of the recipient country. The benefit of the recipient country is to obtain cheaper and highly skilled workers, who increase the overall technological level and competition in the industry, contributing to the intensification of its development processes and increasing its competitiveness on the international market (Dimian et al., 2018). Even if there is no discrimination in the wages of local specialists and immigrants, which sometimes takes place, national economy savings origin from no need to invest in the education of visiting professionals, since these costs are already borne by their country of origin.

Mass immigration of highly skilled workers may cause temporary increase in unemployment in the relevant industries for local professionals, but further development of the industry counteracts this effect, making it temporary (Hovhannisyan et al., 2018).

Thus, decrease in the unemployment rate is observed in Poland (7.1% in June 2017 compared to 8.3% in December 2016), which indicates that the country has passed the main stage of instability associated with mass immigration (in the case of Poland both highly skilled and low skilled). Migration is one of the key reasons that has led to Poland's economic success in recent years. The

country's economy is booming. As a result, the GDP of the Republic of Poland shows a steady upward trend (2.8% in 2016 and 3.9% in II quarter of 2017 compared to previous periods) (Romanska, 2017).

The consequences of migration of this category of specialists for the recipient country's economy are contrary to those of the donor country and are: increasing the share of production and exports of high value-added goods, increasing the level of competitiveness of the economy, and the growth of GDP and other macroeconomic indicators (Formánek, 2019). Thus, as a result of the migration of highly skilled personnel, the gap in the level of economic and social development between the recipient country and the donor country is widening (Podra et al., 2020).

If we consider the impact of migration processes not globally, but separately on different groups of countries, on different industries and spheres of a particular country, it turns out that there are both positive and negative consequences (Table 2).

Table 2: the impact of labor migration of highly skilled staff on donor countries and on recipient countries (SWOT analysis)

Sphere	Advantages	Disadvantages	Opportunities for the future	Threats to the future
Impact of migration on the donor country				
Economics and Finance	Receipt of hard currency (freely convertible currency) into the country. Reducing the pressure of excess work force in the local labor market and, accordingly, social tensions in the country	Decrease in receipts to national GDP, decrease in tax revenue, due to non-payment of taxes by those who have previously worked and are now migrated	Accelerating of technology exchange, increasing of business opportunities, and export facilities for producers, as migrants abroad generate demand for national goods in the host country	Activation of inflationary processes through transfers of funds. Growth in labor remittances of migrant workers can lead to a decrease in output for export
Human capital	Free training of new professional skills of the workforce for the exporting country, familiarity with advanced work organization, etc.	A "brain leak", of qualified, initiative personnel	Reducing unemployment. Improving the quality of human capital in the future (for those who want to migrate)	Load on the social system of the country. Shortage of workers in certain specialties in the labor market
The educational industry	Acquiring new knowledge and skills of migrants returning to their homeland	Human capital outflow. Deterioration of the quality of human capital	Increasing motivation for education or skills for those who wish to migrate in the future	Shortage of entrants due to the departure of children together with their parents - highly qualified specialists
Social Aspect (Family Relationships)	Improving the well-being of poor working-class families	Deepening social inequalities through increased funding for families receiving money transfers from abroad	Changing roles in migrant families. Reducing the burden on local authorities and social institutions that take care of citizens' lives	The weakening of family ties through distance, and the inability to constantly communicate effectively. Destruction of families
Innovative development	Investing to innovative industries by creating joint ventures with foreign founders	Staff insufficiency / absence to generate innovation.	Using the gained experience for develop innovative activities	The loss of knowledge-intensive and high-tech industries competitiveness
Other areas	Increased productivity among remaining citizens	The number of economically active population is decreasing	Development of services for potential migrants	The elderly population is growing, and the number of young people is decreasing
Impact of migration on the host country				
Economics and Finance	Reduction of production costs. Foreign workers, by creating additional demand for goods and services, stimulate production growth and additional employment	Rising unemployment through additional competition in the labor market	Increasing the competitiveness of domestic products and the competitive position of the whole country	Overload of production facilities. Increasing competition of specialists in the domestic market; rising unemployment
Human capital	The intellectual capital receipt	The reorientation of specialists to less skilled work (temporary)	Increasing the country's intellectual potential, including due to rising competition in the labor	The own cadres substitution to foreign ones, population migration abroad

Sphere	Advantages	Disadvantages (phenomenon)	Opportunities for the future market	Threats to the future
The educational industry	Reducing the cost for training specialists	There is no direct negative float	Increase in the practical training level by growth the industries capacity, increasing the number of practice bases	No direct threat was detected
Social Aspect (Family Relationships)	Increasing cultural diversity	Increasing the burden on local authorities, social institutions and migration service	Openness of the country. Following the globalization trends as a factor of the improving the image in the international labor market	The well-being deterioration of professionals families who have lost competitive labor to migrants in the labor market
Innovative development	Involvement of highly qualified professionals in the process of innovation through increased competition in the labor market	There is no direct negative float	Improving personnel potential as a catalyst of the country innovative development	Information leakage. Loss in competition of international markets due to the experienced professionals return to their country
Other areas	Import of skilled work force saves on the cost of education and vocational training Improving demographic situation in the country, slowing down the overall pace of population aging	Social tensions in society. discrimination against migrant workers	Establishment of intercultural relations; internationalization of the population. Increasing demand for the social needs of migrants - the development of other social institutions, religions	Conflicts on racial, national, regional grounds, rise in crime and other negative phenomena

Source: Own research

As we see, the migration of highly skilled IT workforce can cause significant changes in the assessment of many functioning countries (Sriviboon, C., 2020). Taking into consideration this conclusion, it is advisable to analyze and group the areas potentially affected by the international migration processes of IT professionals (Table 3).

Table 3: alternative consequences for the donor country of migrants in the IT industry (high skilled workforce)

Feature of migration processes among IT specialists	Benefits for the donor country	Disadvantages for the donor country	Opportunities for the donor country	Threats to the donor country
Migration of IT specialists by section	Increase of opportunities of career growth for the specialists of lower qualification. Increase in foreign currency earnings	Reducing the development of high value-added industries. Reducing the real consumption of supporting industries for the IT industry	Increasing demand for educational services for IT professionals	Decrease of real investments, decrease of development of other industries
Migration with family	Increasing vacancies in the domestic labor market not only in the IT sector but also in others where family members were employed	Lack of currency receipts	Establishing close community relations with national diasporas in other countries	Changing the social structure of the country, reducing the number of able-bodied population and children, adolescents
The relocate is temporary	Training of domestic specialists; increasing and disseminating international experience	Reduction of revenues from temporary taxation at the time of temporary migration	Increasing the country's innovation potential; increasing opportunities for international cooperation	Disparities in the requirements for the qualification of IT specialists in the future. Dissatisfaction with specialists returning to the country. Temporary relocation may be followed by migration without return.

Source: Own research

Therefore, migration processes are one of the important factors that are taken into consideration when examining the economic situation and development of countries (Prokop et al., 2019). But at the same time, the migration of highly skilled IT professionals can have an impact on the formation and development of country innovation (Afonasova et al., 2019). To date, this indicator is not included in a number of issues that are taken into account when analyzing the innovative development of European countries by the European Commission. According to the European Innovation Scoreboard 2019 (European Innovation Scoreboard, 2020), in the 2018 summary Ukraine innovation index is 0.311. Summary innovation index is formed on the basis and analysis of indicators Human resources, Attractive research systems, Innovation-friendly environment, Finance and Support, Firm investments, Innovators, Linkages, Intellectual assets, Employment impacts, Sales impacts. Each of these indicators is formed accordingly based on the analysis of specific data. Thus, accordingly the indicator Human resources is formed on the basis of New doctorate graduates, population with tertiary education, lifelong learning. But these figures only take into account the actual increase, but do not consider the amount of population with tertiary education and lifelong learning population leaving the country with almost no intention of returning. Thus, when considering the migration of highly qualified staff, having higher education degree and lifelong learning aspirations, this indicator can dramatically change the value of Human resources and Summary innovation index. For the donor country, this may have an impact towards reducing the summary innovation index. At the same time, for the host country, considering the migration processes of highly qualified personnel, in particular the IT industry, can dramatically increase the summary innovation index.

Conclusions

In order to study global processes, the structure of the migrant's distribution in accordance with the total population in percentage terms by continents is presented. According to data from the Department of Economic and Social Affairs Population of United Nations Ukraine is ranked 8th among the countries with the largest number of migrants in the world.

In general, it has been found that the IT market of Ukraine is showing unilateral trends, and that despite the strong development of the industry in Ukraine, it is several times more modest than in some developed countries such as the UK, USA, Poland, and even developing countries (India). In view of this is formed a stable judgment that the migration rates of Ukrainian IT professionals continue to increase.

In most cases, the regions where Ukrainian IT professionals migrate are Western and Central Europe, North America and a small number in the Baltic States. An analysis of the age structure showed that these are mostly young people (21-35 years old). The main factors behind which highly skilled IT workers migrate are not income but quality of living (education, healthcare), company development prospects, as well as access to another culture, opportunity to learn about other countries.

Based on an analysis of several world rankings by indices characterizing quality of life, economic, political, social, etc. (Global Innovation Index, Ease of doing business index, Sustainable Society Index, The Global Peace Index, Index of Economic Freedom, Index of Happiness) it is determined that Ukraine does not occupy key positions in the rankings, which clearly demonstrates its competitiveness in comparison with the leading countries in terms of social, economic development, standard of living and quality of life.

Comparing the Global Innovation Index of Ukraine with other countries that are recipient countries for Ukrainian IT professionals, and analyzing the structure of the Summary Innovation Index, which is formed annually for European countries, it is proposed to include the migration of highly skilled workforce in the evaluation indicators, as taking into account the turnover of specialists and can reflect significant changes in assessing a country's innovation and economic development.

The study grouped the main indicators of the impact of migration processes on donor and recipient countries in terms of economic and innovation component. It is determined that, despite the number of benefits (including financial benefits), for the donor country, labor migration of highly skilled workers reduces the share of high value-added industries and growth of raw material exports, as a result, the country's economy functions as a raw material and forms a typical economic model of the country "of the third world". The effects of the migration of this specialists category on the

economy of the recipient country are opposite and consist in increasing the share of production and export of goods with high added value, increasing the level of the economy competitiveness and the GDP growth and other macroeconomic indicators.

Thus, it is determined that as a result of the migration of highly qualified personnel, the gap in the level of economic and social development between the recipient country and the donor country is widening.

According to the aim of the article main factors of migration of highly qualified specialists influencing the economic and innovative development of countries were identified. So, the study found that the hypothesis was correct and the migration of highly skilled personnel influences the economic and innovative development of both the recipient country and the donor country.

The findings allow allocating the directions for further research as follows: quantitative determination of the migration processes influence on the state of countries economic and innovative development, forecasting and economic-mathematical modeling of changes in the country's economic development in changing or maintaining migration trends, factor analysis of the impact of highly qualified personnel migration on economic development.

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