ECONOMIC ANNALS-XXI
ISSN 1728-6239 (Online)
ISSN 1728-6220 (Print)
https://doi.org/10.21003/ea
http://www.soskin.info/ea/

Volume 183 Issue (5-6)'2020

Citation information:
Hrysenko, M., & Pryiatelchuk, O. (2020). Modelling the factors influencing migration processes in the European Union. *Economic Annals-XXI, 183*(5-6), 26-42. doi: https://doi.org/10.21003/ea.V183-03

UDC: 331.556.4

Maryna Hrysenko
PhD (Physics and Mathematics),
Associate Professor of the Department of General Mathematics,
Faculty of Mechanics and Mathematics,
Taras Shevchenko National University of Kyiv
60 Volodymyrska Str., Kyiv, 01601, Ukraine
magryss@gmail.com
ORCID ID: https://orcid.org/0000-0002-0816-4734

Olena Pryiatelchuk
D.Sc. (Economics),
Associate Professor of the Department of International Business,
Institute of International Relations,
Taras Shevchenko National University of Kyiv
36/1 Yurii Illenko Str., Kyiv, 04119, Ukraine
pryyatelchuk@gmail.com
ORCID ID: https://orcid.org/0000-0002-5222-452X

Modelling the factors influencing migration processes in the European Union

Abstract. The countries of the European Union have traditionally been actively involved in the processes of international labour migration. Given the existence of a general strategy for regulating these processes, there are significant differences in the mechanisms of their implementation in the context of individual national business environments.

This research identifies the factors influencing the formation of volumes, directions, and structure of the system of migration flows in the European region based on the conducted economic and mathematical modelling. Thus, it is possible to state the fact of exclusively economic reasons for labour migration. The social factor, represented by the size of wages, is derived from the economic one and has a secondary impact. The environmental factor does not affect the intensification of migration processes.

The basic factors in determining the current migration policy of the EU are the general situation on the world labour market, the state of socio-economic development of the region, the structure of domestic production and consumption in individual countries. An additional factor influencing today is the nature of the crisis, the cause of which is not economic and financial, but medical and social one.

Given the sustainability of the factors of influence, it is possible to predict changes in the main trends of international labour migration in connection with the COVID-19 pandemic. The consequences are not only a change in migration policy within the region, but also a strategy to attract external migrants from donor countries and the development of a special system for managing migration processes in the new environment.

Keywords: Labour Market; Migration; Crisis; Modelling; Regional Policy; EU
JEL Classification: C25; C54; F16; F66; J21
Acknowledgements and Funding: The authors received no direct funding for this research.
Contribution: The authors contributed equally to this work.
DOI: https://doi.org/10.21003/ea.V183-03

Грисенко М. В.
кандидат фізико-математичних наук, доцент кафедри загальної математики,
механіко-математичний факультет,
Київський національний університет імені Тараса Шевченка, Київ, Україна
Приятельчук О. А.
доктор економічних наук, доцент кафедри міжнародного бізнесу,
Інститут міжнародних відносин,
Київський національний університет імені Тараса Шевченка, Київ, Україна

Моделювання факторів впливу на міграційні процеси в країнах Європейського Союзу

Анотація. Країни Європейського Союзу традиційно активно залучені до процесів міжнародної трудової міграції. Незважаючи на існування загальної стратегії регулювання даних процесів, мають місце суттєві відмінності в механізмах її реалізації в окремих національних бізнес-середовищах.

Автори на основі проведеного економіко-математичного моделювання визначають фактори, що впливають на формування обсягів, напрямів і структури системи трудових міграційних потоків у європейському регіоні. Так, можна констатувати факт винятково економічних причин трудової міграції. Соціальний фактор, представлений розмірами заробітної плати, є похідним від економічного й чинить другорядний вплив. Екологічний фактор взагалі не впливає на інтенсифікацію трудових міграційних процесів або зниження їх обсягів.
Основоположними факторами визначення поточної міграційної політики країн ЄС є загальна кон'юнктура світового ринку праці, стан соціально-економічного розвитку регіону, структура внутрішнього виробництва та споживання в окремих країнах. Додатковим фактором впливу на сьогодні виступає характер кризових явищ, причиною яких є не економічні та фінансові, а медичні та соціальні аспекти.
За умови сталості факторів впливу можна прогнозувати зміни основних тенденцій міжнародної міграції робочої сили в зв'язку з пандемією ковід-19. Наслідками є не лише зміна міграційної політики всередині регіону, а й стратегії залучення зовнішніх мігрантів із країн-донорів і розробка спеціальної системи управління трудовими міграційними процесами в нових умовах.
Ключові слова: ринок праці; міграція; криза; моделювання; регіональна політика; ЄС.

Грисенко М. В.
кандидат физико-математических наук, доцент кафедры общей математики,
механико-математический факультет,
Киевский национальный университет имени Тараса Шевченка, Киев, Украина
Приятельчук Е. А.
доктор экономических наук, доцент кафедры международного бизнеса,
Институт международных отношений,
Киевский национальный университет имени Тараса Шевченка, Киев, Украина

Моделирование факторов влияния на миграционные процессы в странах Европейского Союза

Аннотация. Страны Европейского Союза традиционно активно внедрены в процессы международной трудовой миграции. Несмотря на существование общей стратегии регулирования данных процессов, присутствуют существенные отличия в механизмах ее реализации в отдельных странах.
Авторы на основе проведенного экономико-математического моделирования определяют факторы, влияющие на формирования объемов, стратегических направлений и структуры системы миграционных потоков в европейском регионе. Так, можно констатировать факт исключительно экономических предпосылок трудовой миграции. Социальный фактор, представленный размерами заработной платы, является производным от экономического и осуществляет второстепенное влияние. Экологический фактор фактически не оказывает влияния на интенсификацию миграционных процессов или снижение их объемов.
При условии устойчивости факторов влияния можно прогнозировать изменения основных тенденций международной миграции рабочей силы в связи с пандемией ковид-19.
Основополагающим фактором определения текущей миграционной политики стран ЕС является конъюнктура мирового рынка труда, основные показатели социально-экономического развития региона, структура внутреннего производства и потребления в отдельных странах. Дополнительным фактором влияния в современных условиях выступает характер кризисных явлений, первоочередными причинами которых являются не экономические и финансовые, а медицинские и социальные аспекты.
Последствиями являются не только изменения миграционной политики внутри региона, но и стратегии привлечения внешних мигрантов из стран-доноров и разработка специальной системы управления миграционными процессами в новых условиях.
Ключевые слова: рынок труда; миграция; кризис; моделирование; региональная политика; ЕС.

1. Introduction

International migration can be considered a complex phenomenon in the context of deepening processes of globalization, integration, political change, and environmental disasters that affect the interests of all countries. European Union is a stable region of sustainable economic development. These countries have traditionally been hosting countries for immigrants. This status determines the main directions and mechanisms of implementation of the migration policy of the region. This policy is, aimed at regulating the labour market, its formation in line with the sectoral development of the economy, protection of indigenous peoples as the main labour potential of the country. These measures are complemented by methods of selective policy on immigration, which, on the one hand, allows ensuring the existing demand among employers for certain types of labour, and on the other - to pursue socially responsible policies to protect migrant workers and ensure normal living conditions and equal pay.

Considering the current situation on the labour market, an additional factor influencing the direction of migration policy is the general state of economic development and the crisis. The global financial crisis of 2007-2008 highlighted the potential vulnerability of migrants to economic turbulence in destination countries. The impact of economic crises on migration is a kind of trigger for changes and shifts in the global labour market. This fact both shows its imperfections and forces national governments to review their migration policies to better correlate with the current situation. However, previous economic crises had only financial, production, economic preconditions, which determined their course, consequences, and specific anti-crisis measures of national governments. The current economic crisis of 2020 is caused, first, by negative social changes, in the field of health care and medical care. Its impact on the labour market, migration and the economy remain uncertain. In the case economic crises, the main blow is felt by migrant workers. In the common case the target object will be both migrants and secondary labour market (temporary, seasonal, low-skilled workers) and the primary labour market (indigenous people, highly skilled workers). It will also touch businesses, the economy (critical reduction in labour supply, excessive burden on the social insurance fund in connection with the payment of unemployment benefits, etc.).

2. Brief Literature Review

The issues of development of international labour migration, migration policy of individual countries and regions has been studied worldwide. The main attention in these studies is paid to definition of key categories, revealing of modern tendencies of migration processes.

Basic researches of King (2016) and Schwab (2019) are focused on general issues of migration in the world, in particular, the factors shaping the global labour market, its regional structure (donor countries and importers of labour sources), the main directions and volumes of migration flows, as well as analysis of socio-economic effects for the countries participating in these processes. McAuliffe (2018) explores the demographic aspects of migration processes, which, on the one hand, form the supply and demand for labour, and on the other - have an impact on the socio-economic development of involved countries.

Currently, the issues concerning regional and national characteristics of migration processes are outlined in most scientific papers. Thus, the main attention of Ukrainian scientists, in particular Yaroshevych (2014), Kolesnikova, Camille & Kamasheva (2014), Chernyak (2015), Stakanov (2018), etc. is focused on Ukraine's place in the international market, its role as a donor of highly qualified, high-quality labour force, in particular to the European Union, as well as positive (overcoming unemployment, increasing foreign exchange earnings) and negative (brain drain, social tension) effects on the economy.

The popularity of the regional approach to the analysis of labour migration can be traced to the works of foreign authors, in particular Blizzard & Batalova (2019) studies US regional migration policy and the ambiguous impact of migrant influx on the formation of economic development and socio-political destabilization. Djuve (2016) explores the place of migration in the overall welfare model of the Nordic region, focusing on higher rates of mobility and resilience to risks and market fluctuations of migrants compared to the indigenous population of the region. Bathke (2020) and Edwards (2020) examine the EU's migration policy through the prism of Germany, which has the most advanced social protection system for migrant workers and refugees in the region.

The current challenges and threats posed by the Covid-19 pandemic and their impact on shifting labour market trends are explored by Lindsay (2020) and Davies (2020). The main conclusions of their works are unambiguous - the closure of borders for migrant workers has a negative impact on both the workforce and the donor and host countries. Given the longevity of these constraints, it is almost impossible to predict the full extent of the consequences and avoid economic collapse in the future.

Besides, the reports and some special studies of the international organizations, in particular the International Labor Organization, the International Organization on Migration, the Organization for Economic Co-operation and Development, and the World Bank provide up-to-date statistics on migration flows, their directions and structure.

Unlike other similar studies this article attempts to identify the correlation, causal links between sustainable development indicators and labour market trends, migration processes using econometric methods.

3. Purpose

The main objectives of this paper are: to establish the relationship between the level of economic development and competitiveness of countries with the intensity of their involvement in international labour migration processes, in particular the EU, to identify the highlighting pressing trends and methods of regional labour migration policy, to analyze the factors which influence labour migration processes and to forecast further changes in the formation of a post-crisis environment.

4. Results

The issue of the relationship between migration processes and the level of development, indicators of competitiveness of host countries is now becoming increasingly important in the context of economic globalization and transformation processes. Given the changing trends of the world economy, with high levels of uncertainty, the focus of the migration phenomenon is gaining new dimensions. The question is: Is migration a hidden threat or a clear opportunity? Under what circumstances, in what aspects, or for all countries is it equal?

The current trend shows that countries with international rankings, which show high socio-economic indicators, tend to have the largest share of migrants among their population, implementing long-term strategies to attract the latter for national development.

In the total population, the percentage of migrants in relation to the indigenous population is quite large (See Figure 1). Blue shades indicate countries in which the percentage of migrants' ranges from 5 to 20%, green - up to 5%.

In 2019, the number of international migrants worldwide was about 272 million, which indicates a steady growth trend of this indicator compared to 2010 (221 million) and 2000 (174 million), respectively. At the same time, about half of the total number of international migrants lives in Europe (82 million). It is also important to add that according to the available data, migration takes place mainly within the countries of the same region. For example, in the EU, 51.6% of migrants come from other countries in the region (World Migration Report, 2020).

The World Economic Forum (WEF) defines a country's competitiveness as a set of institutions, policies and factors that ensure productivity (Schwab, 2019). The WEF's Annual Global Competitiveness Report determines the level of competitiveness of countries based on their economic efficiency in accordance with 114 indicators that affect national productivity. Thus, looking at the data for 2019, we can see that the EU countries represented at the top of the

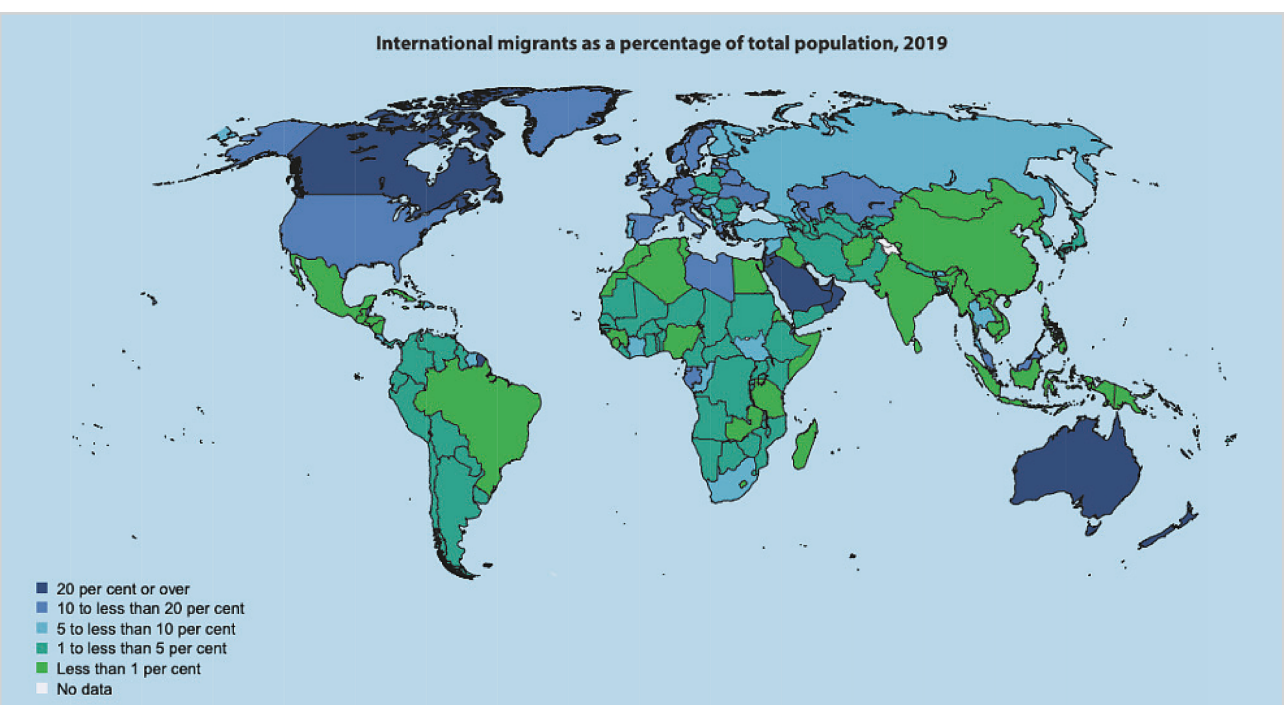


Figure 1:
Percentage of migrants in the total population, 2019
Source: United Nations (2019)

ranking, namely the Netherlands, Germany, Sweden and Denmark, also have a significant share of migrants in their own population (Table 1).

Thus, the hypothesis is confirmed that countries with high socio-economic indicators do attract many migrants in their long-term national development strategies and show a high level of competitiveness.

How are the level of competitiveness, socio-economic development and the country's involvement in migration processes connected? First, countries or regions with higher GDP and progressive economies will always attract a larger share of international migrants. After all, in this case there is a completely natural law - a person's desire for a high standard of living, which is a fundamental inalienable need. Interestingly, even within one country, the placement of migrants is not homogeneous, but shifted, as a rule, towards more economically developed regions. This trend can be illustrated by the example of Germany. In the western lands, which are historically more industrially developed, 25-33% of the population have the roots of migrants, while in the eastern the corresponding share reaches only 6-7% (PICUM Country Brief, 2016).

In view of the above, a logical question arises. In additional it was developed into a large-scale concept by M. Friedman: how is income redistributed in the host country? If a prosperous and economically developed country becomes a so-called «magnet» for migrants, will it suffer from such redistribution, or will migrants take away benefits from indigenous peoples? (Hirst, 2015)

The essence of the scientist's concept is that free migration and a generous welfare state are incompatible, because such a country will undoubtedly attract a large number of low-skilled migrants and needy people of different categories who will try to redistribute unfairly, i.e. without their own contribution of goods available in the host country. Thus, within the framework of this concept, migration undermines the competitiveness of such a host country.

The presented rational approach, at one time, became a catalyst for limiting the so-called «social migration» to developed countries and led to the introduction of quota policies and strict selection of potential migrants.

The risks of redistribution of benefits to migrants have always been at the centre of discussions and have given rise to protectionism over migration in many countries. However, at the same time, there are completely opposite trends.

Table 1:
Top 10 leading countries according to the Global Competitiveness Index 4.0 (2019)

Rank	Country/Economy	Value (0-100)
1	Singapore	84.8
2	United States	83.7
3	Hong Kong SAR	83.1
4	Netherlands	82.4
5	Switzerland	82.3
6	Japan	82.3
7	Germany	81.8
8	Sweden	81.2
9	United Kingdom	81.2
10	Denmark	81.2

Source: World Economic Forum (2020)

4.1. The policy of «brain drain» or intellectual migration

At the present stage of development of the global economy, countries are fiercely competing for skilled labour. The current shortage of scientific and technological personnel in all developed countries, as well as the intensification of the struggle for foreign scientists, highly qualified specialists, and talented youth have transformed intellectual migration into one of the key factors in the country's competitiveness.

Intellectual migration is the migration not only of specialists in the field of science and technology, but also of the creative intelligentsia, including the whole complex of migration flows of qualified personnel working abroad for more than one year.

Intellectual migration is considered from the standpoint of assessing its consequences both for countries that serve as a source of qualified personnel and for host countries. As part of this, the process of «brain drain» within the framework of global intellectual migration acquires negative features for the country of emigration (Chernyak, 2015).

«Brain drain» is a process in which scientists, specialists and skilled workers emigrate from a country or region for economic, less political, religious, or other reasons (Carvalhais, 2012).

From the beginning, the flow of students, scientists and skilled professionals has been directed mainly to economically developed countries, where migration and labour laws have been relaxed for the relevant categories of foreigners, and special measures have been introduced to encourage migrant educators and skilled workers.

It is worth noting that in the 1980s and 1990s, European migration policies were restrictive, and since the early 2000s, a large number of European Union countries have revised their legislation in line with demographic challenges and the growing need for skilled workers to new requirements (International Organization for Migration, 2020).

Considering these transformation processes on the example of European countries, we can trace the gradual tendency to soften the conditions of immigration for promising foreign citizens.

In Germany, for example, amendments to the Citizenship and Aliens Act came into force on 1 January 2000, facilitating entry conditions for highly qualified migrants from non-EU countries. At the same time, however, entry restrictions for low-skilled and unskilled foreigners have been tightened. From July 1, 2013, the country also simplified the employment procedure for foreign professionals living outside the EU. According to the new migration rules, the possibility to get a job in Germany was granted not only to persons with the highest qualification, but also to skilled workers with professional education, i.e. technicians, mechanics, nurses, etc. (Edwards, 2020).

Moreover, from March 1, 2020, the Law on Labour Migration of Qualified Specialists will come into force (Zech, 2020). And one of the main reasons for the adoption of this law is the acute shortage of qualified personnel in various sectors of the economy. For example, there is a significant shortage of medical staff in the country, including highly qualified doctors, as well as educators, primary school teachers, engineers, metallurgists, cooks, and so on. This trend is observed due to the negative demographic situation. The problem is exacerbated by the aging of the nation, as well as the possibility for Germans to retire early (63 years instead of 67). Thus, the new bill aims to fill the «floating» vacancies and, according to government forecasts, to attract to the country annually 25 thousand qualified professionals from other countries, including from outside the EU (Stakanov, 2018).

It is worth noting that similar measures are being implemented in many EU member states. In 2007, the European Commission decided to introduce a so-called «blue card» to ensure the influx of highly qualified professionals from third (non-EU) countries (Joint Research Centre (European Commission), 2018).

Despite the obvious positive consequences for recipient countries, a trend has recently become widespread, indicating that a large proportion of highly skilled migrants do not find the right level of knowledge and skills in the host country and are forced to work in worse conditions.

An interesting trend can also be considered the fact that in the global market of intellectual labour, qualified personnel move not only from developing countries to developed ones, but also vice versa. This phenomenon is a consequence of subsidizing targeted programs to attract specialists from developing countries (ECOSOC, 2008). Thus, they increase the demand for this category of workers in their segments of the world labour market.

Multinational Companies are also an important player in these processes, as they have significant opportunities to operate without regard to geographical and political boundaries. Along with them, educational institutions and research centres are also strong competitive opponents for the states, which also compete for the possibility of admitting potential foreign workers to the countries. Currently, about 3.5 million people study outside their own country of residence. If in 1975 about 600 thousand people studied abroad, according to OECD forecasts, by 2025 this figure will reach 7.2 million people (OECD I Library, 2019).

For a specific example, it is appropriate to consider an international exchange program for students and teachers between the universities of the European Union, as well as a number of non-EU countries - Erasmus +. The main goal of this program is to improve the quality of education, develop mobility and cultural ties between students and teachers. Moreover, this experience gives the participant the opportunity for the so-called «test drive» of life, study or even work abroad, as well as a good prerequisite for further migration. Thus, in 2018, the number of people who studied, did internships or volunteered abroad was 853,000, the total budget was 2.8 billion euros, which allowed to implement 23,500 projects, involving 95,000 organizations. In recent years, we can trace the trend of increasing key performance indicators of the program (Kacprzak, 2018).

4.2. Migration as an important resource for development

The influx of foreign migrants is a vital factor in improving the efficiency of the national economy for countries with a tendency to shrink and age. All waves of migration are formed and used as anti-crisis measures to restore and revive the economy. In this case, the main factor is the cost of labour and in this context, migrants have the greatest number of benefits. EU is currently experiencing a new wave. Thus, due to the relatively cheaper labour of migrants, many European countries overcome the crisis in their economies, restore population losses due to lower birth rates and imbalances in the age structure (King & Lulle, 2016).

Currently, according to the World Migration Report 2020, there is a trend of demand for migrants, whose flows are the strongest, young (average 39 years), ambitious and promising members of different ethnic groups. Moreover, they migrate not only from the poor, but also from developed countries and regions. For example, German citizens tend to go to work and live in Switzerland, where wages, quality of life and excellent ecology are higher (International Organization for Migration, 2020). That is, migration among the member states of the European Union is very common.

Considering Figure 2 which presents the share of migrants in the total population of EU countries (yellow - residents of other EU member states, blue - other regions of the world)., we can see that for most European countries it is characteristic that about half or more of the total number of migrants in the country is the share of migrants from other countries of the European Union. It points to a brisk trend towards regional migration within the EU.

In addition to the impact of migration flows on the competitiveness of host countries, undoubtedly the relevant processes are typical for migrant-donor countries.

First, it is a way to combat national unemployment. The outflow of labour increases the employment opportunities of a significant proportion of the local population, especially effectively for countries with overcrowding. For example, this method of combating unemployment is used not only by developing countries, but also by developed countries such as Sweden, which sends its workers to Norway (Djuve, 2016).

Second, migrants increase inflows to the country of origin of foreign currency, expressed in the form of transfers. It is important to note that these transfer payments make up a significant part of foreign exchange earnings, and sometimes are even the only source of the latter for countries - world exporters of labour (Lindsay, 2020).

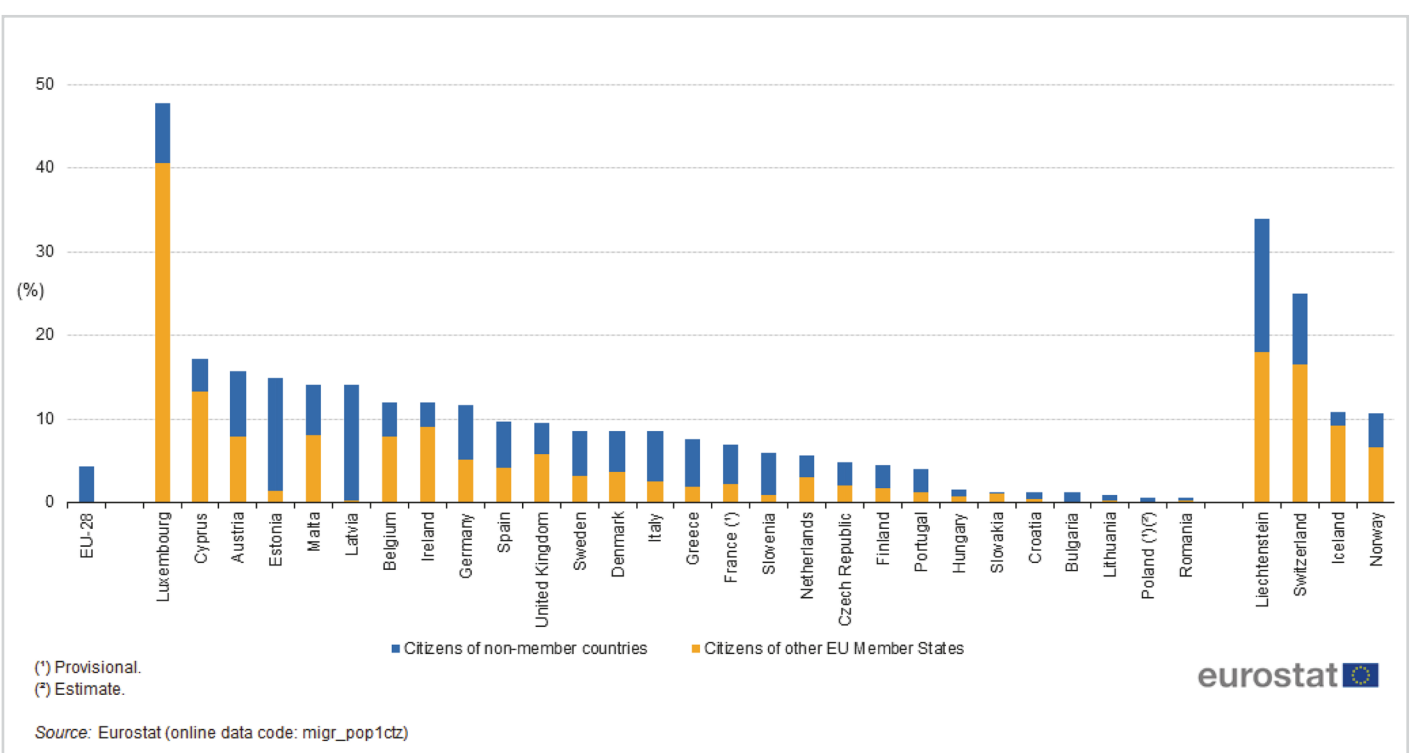


Figure2:
Share of non-nationals in the resident population, 1 January 2018
Source: Eurostat (2018)

Emigration also revives the economic life of the donor country when migrants return home with new knowledge, useful experience and even material components from abroad to start a business in their country based on the latest technologies and forms of business. In addition, being abroad, learning a new language, getting used to a different lifestyle, these workers are more flexible in the context of developing and supporting the latest economic initiatives. As an example, it is worth mentioning Indian scientists who, after returning from the United States, where they worked for several years in high-tech American corporations in the Silicon Valley, later became the founders of the Indian industry of creating the new computer programs (Gibbs, 2014).

From the point of view of economic theory, emigration also contributes to the increase of the average level of wages and average incomes in the country, as the excess share of labour leaves the labour market thereby reducing the supply of the latter.

However, the biggest problem of emigration is the outflow of qualified personnel from the country, given the fact that this category of workers has invested resources in education and training, as well as taking into account the losses due to departure, namely the so-called «missed benefit» - the cost of products that could be created by these specialists (Ratha, 2015). Of course, it is necessary to add the amount of potentially unpaid taxes.

4.3. Econometric analysis of the migration processes

There are many different approaches and already established economic and mathematical models for assessing the propensity of the population to migrate. Many studies are based on opinion polls, which have a few shortcomings, including the complexity of information selection and the rapid loss of relevance of the results. Sociological surveys are used both in pure form and with subsequent expert processing. For example, experts from the Central European Forum for Migration and Population Research in Warsaw of the Warsaw School of Economics (Poland) use the Delphi method to predict migration between EU countries (Wiśniowski & Bijak, 2009).

The American Institute of Public Opinion GALLUP has identified an index of potential net migration, which characterizes the difference between the number of adults who will favourably agree to immigrate to the country and the number of people who agree to emigrate, relative to the total adult population (Esipova, Pugliese, & Ray, 2014).

The most common approaches to mathematical modeling of migration processes are based on official statistics. In such models, an important task is to select and consider the factors that affect the volume of migration flows. One of the basic mathematical models for estimating the population's propensity to migrate and forecasting its volume is based on the provisions of the gravitational law of spatial interaction. According to this law, the «demographic» force of gravity between regions is inversely proportional to the distance between them. The proposed by J. Zipf, so-called gravitational model for predicting migration between regions (Zipf, 1949) has the next form:

$$M_{ij} = G \cdot \frac{P_i \cdot P_j}{R_{ij}^2}, \quad (1)$$

where:

M_{ij} is the scale of migration between regions i and j;
P_i, P_j are population in regions i and j, respectively;
R_{ij}^2 is distance between cities i and j;
G is sustainable «gravity» statistically calculated.

In this model, the migration flow between regions is directly proportional to the size of the population in the regions and inversely proportional to the square of the distance between them. The disadvantage of this model is the assumption about the symmetry of migration flows between regions, but in practice this is not true. The model also does not consider the factors of socio-economic development of the regions that influence a person's decision to migrate.

Stouffer intermediate capabilities models are the alternative to gravitational models (Stouffer, 1960). The sociologist believed that the number of people moving a certain distance is inversely proportional to the number of obstacles and directly proportional to the number of prospects for migrants. As obstacles, Stouffer considered the circumstances that hinder the migration process (relocation costs, lack of information, negative attitude of the local population to visitors, political and legal restrictions, etc.). He believed that the distance and population of the two territories is not the main thing that determines the amount of migration between

them. The advantage of this theory is that it considers various factors that affect the probability of migration.

The theory, which would consider many factors of socio-economic processes that influence a person's decision to migrate, was proposed by Lee in 1966 and was called the «Push-Pull theory» (Lee, 1966). According to this theory, the volume of migration is influenced simultaneously by the distance between the regions, the factors of «departure from» and «arrival to» the regions and the personal characteristics of migrants. According to the theory, the factors of «push» act on a potential migrant person in the country of departure, respectively, the factors of «attraction» act in the country of arrival of a migrant worker. In addition, the theory considers the presence of obstacles that affect the immediate process of moving a person, such as distance, cost of moving and others.

To establish the main trends in migration processes and find the causal links between indicators of sustainable development (social, environmental, and economic components), we conducted an econometric analysis of the activity of migration processes. As a result, an economic and mathematical model was built. The main studied factors for analysis were selected as follows; GDP per capita; GDP in % of world GDP; foreign direct investment; unemployment rate; level of wage taxation; inflation rate; ecological footprint; average monthly salary; imports; immigration and emigration flows (Table 2).

After the first stage of modeling, were identified economic factors (gross domestic product per capita) (X_1), percentage of world GDP (X_2), foreign direct investment (X_3), foreign economic turnover, wage taxation system, level of wage taxation (X_5), inflation (X_6), socio-economic factors (unemployment and employment rates (X_4), average wages (X_8)) and environmental factors (X_7) that affect migration processes. Thus these factors describe the activity of involving the population in immigration (M_1) and emigration (M_2) flows. In the regression model, the initial data were grouped in Table 3 and Table 4.

At the second stage of modelling we will establish a correlation between the factors of influence. The closer the absolute correlation coefficients are to 1, the stronger the relationship between the factors. The sign «+» or «-» indicates a direct or inverse relationship. In Figure 3 pair wise correlation coefficients are visually presented. There is a strong positive correlation between the three variables X_1, X_7 and X_8, numerical values: $cov(X_1, X_7) = 0.77$; $cov(X_1, X_8) = 0.9$; $cov(X_7, X_8) = 0.64$. Less strong dependence between variables X_1 and X_3 $(cov(X_1, X_3) = 0.43)$; variables X_5 and $X_6 (cov(X_5, X_6) = 0.44)$; as well as between variables X_6 and X_7 $(cov(X_6, X_7) = 0.44)$. A negative correlation is observed between variables X_3 and X_5 $(cov(X_3, X_5) = -0.44)$.

The task of the next stage of modelling was to determine the impact of individual indicators of socio-economic development of the country on migration indicators, as well as the formation on this basis of the principles of the overall migration policy of the European Union. The simulations were performed separately for immigration (M_1) and emigration (M_2). Given the existing

Table 2:
The main variables of the models of immigration and emigration flows

Variables	Description
X_0	competitiveness index
X_1	GDP per capita
X_2	GDP in % of world GDP
X_3	foreign direct investment
X_4	unemployment rate
X_5	level of wage taxation
X_6	inflation rate
X_7	ecological footprint
X_8	average monthly salary
X_9	import, % of GDP
X_{10}	food supply and basic medical care
M_1	immigration
M_2	emigration

Source: Presented by the authors within the developed econometric model

Table 3:
Initial data for modelling the impact of economic factors on migration processes (2019)

EU countries	GDP per capita, US dollars (X_1)	% of world GDP (X_2)	Foreign direct investments (X_3)	Wage taxation, % (X_5)	Inflation (X_6)	Import, % of GDP (X_9)
Austria	47290.0	0.35	0.6	34.2	1.6	55.3
Belgium	43582.2	0.42	2.6	46.2	2.0	105.0
Bulgaria	8064.0	0.12	3.1	20.2	-0.1	69.0
Croatia	13138.3	0.08	2.9	19.4	0.0	53.7
Cyprus	24976.2	0.03	40.5	13.4	-0.3	72.8
Czech Republic	20152.4	0.30	2.8	38.4	1.6	86.2
Denmark	56444.1	0.23	0.3	3.8	0.7	81.9
Estonia	19840.1	0.03	3.2	38.8	2.3	47.7
Finland	46016.7	0.19	2.4	25.4	0.6	39.9
France	39869.1	2.23	1.2	51.1	0.7	33.5
Germany	44549.7	3.28	3.6	21.4	1.0	40.4
Greece	18637.3	0.24	1.2	28.0	0.6	34.4
Hungary	15531.2	0.23	0.7	34.3	1.4	82.3
Ireland	70638.3	0.28	23.8	12.2	0.0	85.5
Italy	31984.0	1.82	0.9	23.2	0.6	29.2
Latvia	15547.2	0.04	2.5	26.8	1.5	65.2
Lithuania	16730.2	0.07	1.1	35.2	2.2	81.2
Luxemburg	105803.1	0.05	70.9	15.5	1.0	158.4
Malta	27250.4	0.02	79.4	11.1	1.1	124.1
Netherland	48345.7	0.72	6.9	19.8	0.7	95.1
Poland	13822.6	0.88	2.2	25.0	0.7	51.2
Portugal	21161.3	0.25	2.7	26.8	1.1	45.2
Romania	10757.0	0.38	2.1	25.8	-0.1	47.2
Slovakia	17664.3	0.14	0.7	39.7	0.4	95.8
Slovenia	23654.4	0.06	1.8	18.2	0.7	84.1
Spain	28358.8	1.40	1.9	35.8	0.9	32.5
Sweden	53217.8	0.41	1.8	35.4	1.5	41.2
United Kingdom	39734.6	2.29	2.3	10.9	1.7	32.5

Source: The World Bank Data (2020)

Table 4:
Initial data for modelling the impact of socio-economic and environmental factors on migration processes (2019)

EU countries	Employment and unemployment (X_4)	Average salary (X_8)	Ecological factors (X_7)	Food supply and basic medical care (X_{10})	Immigration (M_1)	Emigration (M_2)
Austria	5.5	4261	5.9	99.11	194306	67212
Belgium	7.1	3658	6.7	98.70	137868	88935
Bulgaria	6.2	586	3.2	95.76	29559	33225
Croatia	11.2	1139	3.6	97.15	35500	39515
Cyprus	11.0	1939	3.3	98.25	23442	15340
Czech Republic	2.9	1243	5.6	98.55	65910	26742
Denmark	5.7	5626	7.1	98.72	64669	60381
Estonia	5.8	1310	7.0	97.89	17547	10476
Finland	8.6	3465	6.1	99.22	7253	19141
France	9.4	2957	4.7	98.80	386911	341421
Germany	3.8	3880	5.1	98.88	893886	540415
Greece	21.5	1060	4.3	98.85	119489	103049
Hungary	4.2	1035	3.6	98.15	82937	48178
Ireland	6.4	3966	4.7	98.82	97712	53735
Italy	11.2	2595	4.3	99.08	332324	156960
Latvia	6.7	1004	5.6	97.34	10909	15814
Lithuania	7.1	924	5.8	97.34	28914	32206
Luxemburg	5.5	5143	12.3	98.97	24644	13985
Malta	4.0	1379	4.9	98.48	12215	9342
Netherland	4.8	2855	5.9	98.75	26444	109635
Poland	4.9	1076	4.4	97.21	105633	189794
Portugal	8.9	1170	3.7	98.50	214083	31600
Romania	4.9	965	2.8	95.00	43170	231661
Slovakia	8.1	1013	4.2	96.77	28455	3298
Slovenia	6.6	1682	4.7	97.55	172578	13527
Spain	17.2	2071	3.8	99.03	643684	309526
Sweden	6.7	3373	6.6	98.99	31106	46981
United Kingdom	4.3	2389	4.8	98.12	132602	344347

Source: The World Bank Data (2020)

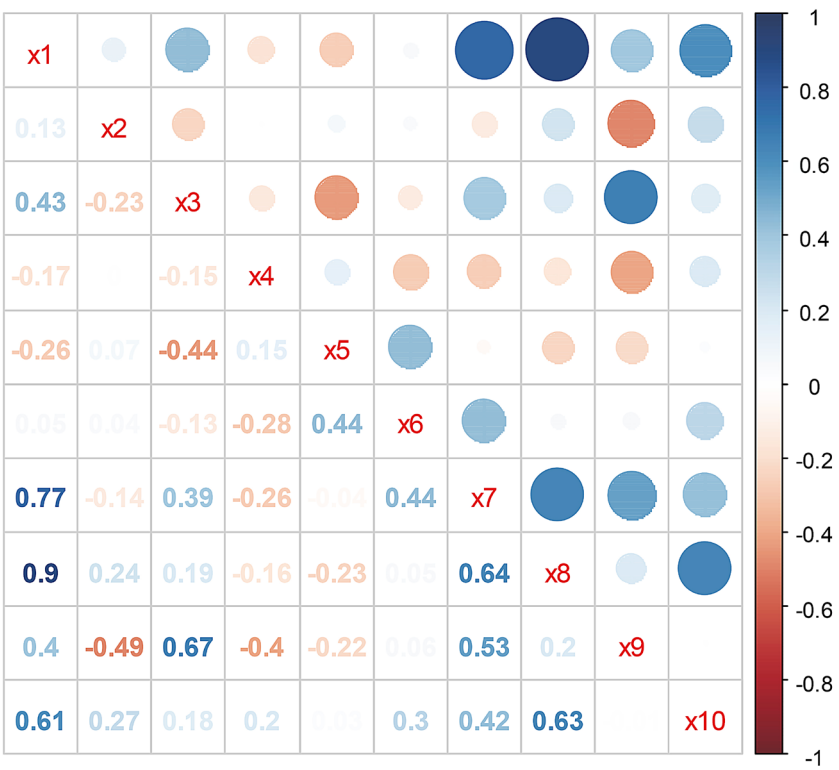
relationships between groups of variables, the final analysis included variables Construction of regression equations and calculations performed using software ***R***.

An econometric model of multifactor regression for the dependence of immigration flows is constructed. The obtained estimates of the model parameters are reliable and adequate, which follows from the data in Table 5.

The model has the next view:

$$M_1 = -103300 + 0.1\,X_1 + 198200\,X_2 + 460.8\,X_3 + 10240\,X_4 + 1650\,X_5\,. \quad (2)$$

Based on the analysis of the regression model, we can conclude that a significant impact on immigration processes of population activity is mainly the economic indicator of the country's development - a percentage of world gross domestic product (X_2). Other indicators are insignificant.



Note: The correlation coefficient expresses the degree of dependence between indicators. The size of the circle indicates the magnitude of the correlation. The circle of maximum size corresponds to the correlation coefficient 1. The closer to 1, the larger the radius is. A decrease in the size of the circle indicates a decrease in the correlation coefficient. Blue colour means positive correlation coefficient, red colour means negative one. A brighter blue colour means that the coefficient is closer to the value «+1», a brighter red colour means that the coefficient is closer to the value «-1».

Figure 3:
Pair wise correlation between the variables
Source: Developed by the authors based on the own correlation analysis

Table 5:
The results of estimates of regression parameters for the variable M_1 (immigration)

Coefficient	Value of coefficient	Standard error	*t*-statistics	*P*-value
Const	-103300.0	93710.0	-1.102	0.2822
X_1	0.1	1.3	0.076	0.9401
X_2	**198200.0**	**30100.0**	**6.585**	**1.27E-06**
X_3	460.8	1462.0	0.315	0.7556
X_4	10240.0	5944.0	1.722	0.0991
X_5	1650.0	2306.0	0.715	0.4819

Source: Calculated by the authors

The coefficient of determination is used to check the significance of the parameters of the equation and to select the most optimal regression model. To consider the constructed regression model reliable, the value of the coefficient of determination must exceed 0.5 and approach 1. The coefficient of determination calculated for this model is quite high: $R^2 = 70.5$, so the model is reliable and adequate.

The econometric model of multifactor regression for the dependence of emigration flows is similarly constructed. From the data in Table 6 it follows that the obtained estimates of the model parameters are reliable and adequate.

The model of multifactor regression has the next view:

$$M_2 = 26590 - 0.4\,X_1 + 150600\,X_2 + 30.9\,X_3 + 1211.0\,X_4 - 189.4\,X_5 . \quad (3)$$

Obviously, the situation is similar. The dependence exists only on the general indicator of economic development - GDP. The coefficient of determination $R^2 = 87.9$ calculated for the model, which indicates the reliability and adequacy of the model.

Thus, it is possible to state the fact of exclusively economic reasons of labour migration. The social factor, represented by the size of wages, is derived from the economic (as seen in the previous figure), and therefore has a secondary impact. At the same time, the environmental factor does not affect the intensification of migration processes or reduce their volume.

Table 6:
The results of estimates of regression parameters for the variable M_2 (emigration)

Coefficient	Value of coefficient	Standard error	*t*-statistics	*P*-value
Const	26590.0	39090.0	0.68	0.504
X_1	-0.4	0.5	-0.82	0.421
X_2	**150600.0**	**12560.0**	**11.99**	**4.04E-11**
X_3	30.9	609.9	0.051	0.96
X_4	1211.0	2480.0	0.488	0.63
X_5	-189.4	962.2	-0.197	0.846

Source: Calculated by the authors

4.4. EU common regional migration policy

The urgent state of the labour market, the direction of international migration flows, the state of socio-economic development of the EU, as well as the general principles of socio-economic strategy of the region are important factors for studying.

The state of modern international immigration flows is characterized by a constant increase in scale, geography, and intensity. This is becoming an increasing threat to the security of individual European nation states, the entire European Union. The regulation of these processes at the level of EU countries is carried out in accordance with a certain organizational and legal mechanism of migration policy, which has changed in certain periods in accordance with external challenges. The important role of the European Union in solving international migration problems provides it with significant foreign policy positions on the world stage. Adjustment of certain principles of migration policy within the framework of this supranational formation determines the change of the EU's place in the system of international relations.

In conditions of growing socio-economic instability, exacerbation of military and political threats in Africa and the Middle East, there has been a long period of intensive growth of migration flows in the EU, which at a certain stage of development led to a crisis in this area. In view of the above, it is necessary to analyze the changes in this policy at the system level, to assess them in terms of the effectiveness of solving the problem of migration crisis and the external position of the European Union.

The research and assessment of the dynamics of changes in the main indicators of migration processes in the EU over the past decade reveals the reduction of migration flows associated with improved management of migration policy in the EU (Yayboke & Gallego, 2019). These optimization aspects are caused by:

- the definition and implementation of measures to respond to major problems and the development of promising ways, strategies to address the migration crisis;

- improving and harmonizing the legal mechanism for regulating migration policy, which includes the creation of a more effective system of migration legislation at the supranational level of the EU.

If we analyze the views on the level of immigration into the country, out of all 28 EU countries, 5 countries (Denmark, Great Britain, Croatia, France and the Netherlands) indicate that the level of immigration is too high (as our model of multifactor regression shows). At the same time, based on the statistics of the share of migrants in the population, these countries do not have the highest percentages. This may indicate that the readiness of EU countries in terms of economic, social, environmental, and infrastructural conditions and opportunities is different. In addition, the subjective perception of immigrants in these countries, the density of their placement in the host countries, as well as the risks of xenophobia and actual or potential threats of extremism are important. At the same time, the policy of reducing the flow of immigrants to the country is pursued by 6 EU countries - such a policy is applied to all categories of immigrants (except for highly qualified, which these countries still seek to attract into the economy).

Summarizing the elements of migration policies of the EU countries, it is possible to identify that they are structured according to the models of immigration flow management.

Regarding the emigration policy of the EU countries, it should be noted that in the vast majority of countries the level of emigration is considered satisfactory (22 EU countries, except Bulgaria, Poland, Romania, Slovakia, Latvia and Croatia, which have a high level of emigration). Note that all these countries are relatively new members of the EU, who also experience problems with the emigration of people to more developed EU countries, due to the benefits of free movement of people.

The dynamics of the considered changes in the legal regime of migration policy in the EU corresponds to the declared parameters aimed at resolving the crisis in this area. In particular, as noted above: the flow of migrants to the European Union has decreased; the procedure for processing asylum applications was accelerated and optimized, which facilitated the rapid processing of a large number of applications and accelerated deportation to the homeland in the event of denial of asylum. These results were facilitated by agreements with third countries, which on a parity basis assumed responsibility for helping refugees. These facts, of course, indicate the positive impact of the reforms in the field of EU migration policy (Reidy, 2020). These changes have had a positive effect on strengthening the European Union's external position as a powerful supranational entity that successfully addresses migration management issues.

National labour migration management systems in the EU are differentiated. Most of them are determined by demand, as citizens from outside the EU need an invitation to work from a local employer to be able to immigrate. The only countries with a specific labour supply-oriented system are Austria, Denmark, and Germany. These countries issue visas for first-time jobseekers, so there is temporary access for highly qualified foreigners from third countries based solely on their human capital, without inviting them to work. In general, to receive an invitation to work, the employer must include pay provisions above the average. Thus, the main condition of the EU Blue Card is the remuneration of highly qualified immigrants at the level of more than 1.5 times the national average annual wage (Desiderio, 2016).

Recently, most of the migration systems for skilled workers in the EU have begun to transform into a synthetic management model in search of a balance between labour supply and demand. Another feature of labour migration to EU countries is its temporary nature. Highly skilled workers in many cases do not receive the right to permanent residence during the first issue. According to the European model, residence permits are renewable, which may ultimately lead to permanent residence status after a certain period and compliance with local legislation (Reidy, 2020).

The European Commission is working to establish an agreed common framework for legal immigration, including of skilled workers. However, after a long period of negotiations on common minimum conditions of access to the labour market for highly qualified migrants, the requirements of the Blue Card between different countries continue to vary significantly. Since 2016, the process of developing of a new mechanism at EU level has been started. Its main goal is to promote potential migrants and employers, as well as to encourage skilled migration, drawing on the experience of Canada, Australia, and New Zealand (Reidy, 2020; Yaroshevych, 2014).

Given the limited powers of the EU institutions in the field of migration, the potential introduction of «Express Access» to employment at the EU level may consist of the following key bases:

- general mechanism for assessing the educational level of foreign workers at the EU level;
- common guidelines and tools for assessing the language skills of migrants;
- access to the mechanism for finding vacancies in the EU for those candidates who demonstrate a high level of qualification and language access;
- establishment of an institution at the EU level to manage this system;
- introduction by member states and the European Commission of common selection criteria based on their professional characteristics, the availability of a job invitation, which may become a new version of the Blue Card;
- agreement between Member States and the European Commission on the mechanism for selecting candidates for immigration from the basis of national immigration systems (Volpicelli, 2015).

Thus, such migration systems allow to effectively managing migration flows to make full use of the immigration tools of host countries for the removal of workers with the highest human capital. At the same time, while at the national level of individual countries this system has been used successfully for a long time, and in recent years has been modernized and optimized to meet the needs of national economies, at the regional level, including the EU, there is no common approach to migration policy.

4.5. Migration in a coronavirus pandemic

There is no doubt that the current situation of the coronavirus pandemic (COVID-19) could have devastating consequences for migrants around the world for several reasons. Incidentally, suspending the flow of migrants will also have an impact on the economic development of both host and labour-donor countries.

First, the pandemic is expected to exacerbate the already existing vulnerability of global refugees in a number of respects: access to treatment and health care, suspension of assistance and counselling for displaced persons in other countries, and political sentiment and propaganda leading to even more negative attitudes towards migrants in the society of the host country and, accordingly, there will be new problems regarding the full integration of migrants in society.

Secondly, with regard to intellectual migration, for example, it is quite logical to assume that the migratory mood of a certain part of highly qualified personnel will change due to the high probability of infection during cross-border travel, even with the opening of state borders. That is, a person's instinct for self-defence will naturally prevail over the satisfaction of economic or cultural needs through migration to countries with a higher standard of living.

With the development of the pandemic, a large number of migrants began to return to their countries to avoid infection in a country with a high rate of infection, reunite with family or for other reasons. Thus, we can now trace the trend of outflow of migrants from the European region. For example, the number of Ukrainian and Russian workers in the EU alone ranges from 3 to 7 million (including seasonal workers and excluding illegal migrants) (Fedyuk & Kindler, 2016). For first months of 2020 more than 270 thousand migrant workers returned to Ukraine. For example, Poland has already calculated losses from the outflow of migrant workers, including Ukrainians, who make up about 7% of GDP of Poland (Chukhnova, 2020).

Moreover, the EU countries are rapidly introducing special measures to encourage foreign workers to stay in the country. For example, a special package of anti-crisis measures called «Anti-crisis shield» was developed. One aspect of this program was the automatic extension of labour visas for migrants until the end of the epidemic, plus an additional 1 month, who due to quarantine cannot return home and renew their documents. Moreover workers can get help and advice in processing documents, and the opportunity to obtain a free residence permit for a period of three years.

An additional threat to the competitiveness of European countries in the context of the coronavirus pandemic and the mass exodus of migrant workers is the issue of seasonal work. We are talking about agriculture, which traditionally generates a significant share of GDP in most countries in the region. Farmers are already suffering huge losses since no one can harvest. It is also an interesting fact that the local population, despite losing their jobs, does not want to work in the fields. Therefore, some countries are already taking serious measures to transport migrants, despite the closed borders and the state of quarantine. Germany has already announced that it will allow entry for 40,000 seasonal workers from Eastern Europe in April and May 2020 (Chukhnova, 2020). The only problem was the fact that the worker left the host country.

However, this issue is already being promptly resolved. As of April 9, the first planes with seasonal workers from Romania landed in Dusseldorf for the urgent collection of asparagus, strawberries, and vegetables. Thus, since seasonal workers are only allowed to enter the country by plane, the transportation of workers to Germany from Eastern European countries, namely Romania, Bulgaria, and Poland, has been restricted by Eurowings.

The quarantine and the accompanying crisis will undoubtedly hit the labour market in the EU region. The impact in the field of tourism and hotel and restaurant business is expected to be particularly significant, so migrant workers are unlikely to be able to find work in this field (Davies, 2020). In addition, the authorities are encouraged to hire local people to mitigate the effects of the crisis.

The greatest demand for foreign labour resources throughout the summer of 2020 will be enjoyed by the agricultural sector, as mentioned above. Also, despite the current decline in demand for caregivers in Italy, at the end of the quarantine is projected rapid growth of this indicator, which is impossible to meet without the involvement of foreign labour (European Data Portal, 2020).

Nurses and builders will be in demand. However, at the same time, the average level of wages is expected to decline, as on the one hand, firms and private entrepreneurs will try to reduce wage costs due to the deterioration of their own financial situation. On the other hand, they understand that under these circumstances, workers will agree to work for less (European Data Portal, 2020).

5. Conclusions

The countries of the European Union as a stable region of sustainable economic development have traditionally been hosting countries for immigrants. This status determines the main directions and mechanisms of implementation of the migration policy of the region, aimed at regulating the labour market, the formation of its corresponding to the sectoral development of the economy. At the same time, EU countries are extremely dependent on external migrants, who make up the bulk of the labour force in several sectors, including agriculture, services, services, health care, and so on.

The basic factors determining the current migration policy of the EU are the general situation on the world labour market, the state of socio-economic development of the region, the structure of domestic production and consumption in individual countries. An additional factor today is the nature of the crisis, the main cause of which is not economic and financial, but medical and social aspects.

A pandemic is a significant factor in today's environment. The consequences are not only a change in migration policy within the region, but also a strategy to attract external migrants from donor countries and the development of a special system for managing migration processes in the new environment.

Despite the specific latest conditions for the formation of migration flows and the implementation of migration policy, the main factors influencing the activity of migration processes and mechanisms of their state regulation remain traditional.

Thus, based on mathematical modelling, among several factors of sustainable development (social, economic and environmental), the factors of minimum and maximum impact. The influence on the formation of directions and activity of the migration processes themselves, as well as the vectors and mechanisms of implementation of the EU migration policy were studied. The model provides a weighted average for the entire region. However, it can be calculated based on regression analysis for each individual country. Thus, it is possible to state the fact of exclusively economic reasons of labour migration (both emigration and immigration). The social factor, represented by the size of wages, is derived from the economic one, and therefore has a secondary impact. At the same time, the environmental factor does not affect the intensification of migration processes or reduce their volume. This set of factors should be considered both in the process of forming a strategy and mechanisms for implementing the general principles of migration policy, and for forecasting migration processes in the EU region.

References

1. Awad, I. (2009). *The global economic crisis and migrant workers: Impact and response.* Geneva: International Labour Organization, International Organization for Migration.

2. Bathke, B. (2020). *In Germany, the coronavirus disproportionally affects migrants.* Retrieved from https://www.infomigrants.net/en/post/26440/in-germany-the-coronavirus-disproportionately-affects-migrants
3. Blizzard, B., & Batalova, J. (2019). Refugees and Asylees in the United States. *Migration Policy Institute*. Retrieved from www.migrationpolicy.org/article/refugees-and-asylees-united-states
4. Carvalhais, I. E. (2012). Brain drain/brain gain from the perspective of a semi-peripheral state: Portugal. *Skilled migration and the brain drain, 14*(1), 99-117. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000218285
5. Chernyak, Y. (2015). Increase of internal migration in Ukraine: advantages and disadvantages for national enterprises, influence on country's competitiveness. *Regional Innovations, 26*(3), 121-132.
6. Chukhnova, M. (2020). Ukrainian labor migrants turn west. *Eurasianet.* Retrieved from https://eurasianet.org/ukrainian-labor-migrants-turn-west
7. Davies, S. (2020). Migrant workers face cruel summer as COVID-19 batters European tourism. *Reuters.* Retrieved from https://www.reuters.com/article/us-health-coronavirus-europe-tourism-trf/migrant-workers-face-cruel-summer-as-covid-19-batters-european-tourism-idUSKBN22R22Y
8. Department of Economic and Social Affairs, ECOSOC. (2008). *Achieving Sustainable Development and Promoting Development Cooperation. Dialogues at the Economic and Social Council.* Retrieved from https://www.un.org/en/ecosoc/docs/pdfs/fina_08-45773.pdf
9. Desiderio, M. V., & Hooper, K. (2016). The Canadian Expression of Interest System: A Model to Manage Skilled Migration to the European Union? *Migration Policy Institute.* Retrieved from https://www.migrationpolicy.org/research/canadian-expression-interest-system-model-manage-skilled-migration-european-union
10. Djuve, A. B. (2016). Refugee migration - crisis for the Nordic model? *International policy analysis.* Retrieved from https://library.fes.de/pdf-files/id/12488.pdf
11. Edwards, R. (2020). The new skilled immigration law in Germany. *Lexology.* Retrieved from https://www.lexology.com/library/detail.aspx?g=b56923d2-f266-4307-9e86-d51ecf3f88c1
12. Esipova N., Pugliese, A., & Ray. J. (2014). *Potential net migration index declines in many countries. GALLUP*. Retrieved from http://news.gallup.com/poll/166796/potentialnet-migration-index-declines-countries.aspx?utm_%20source=PNMI&utm_medium=search&utm_campaign=tiles
13. European Data Portal. (2020). *Changes in the labour market.* Retrieved from https://www.europeandataportal.eu/en/impact-studies/covid-19/changes-labour-market
14. Eurostat. (2017). *Asylum and managed migration.* Retrieved from http://ec.europa.eu/eurostat/web/asylum-and-managed-migration/data/database
15. Eurostat. (2018). *Share of non-nationals in the resident population.* Retrieved from https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Share_of_non-nationals_in_the_resident_population,_1_January_2018_(%25).png&oldid=424544
16. Fedyuk, O., & Kindler, M. (2016). *Ukrainian Migration to the European Union. Lessons from Migration Studies*. Springer. Retrieved from https://link.springer.com/book/10.1007/978-3-319-41776-9
17. Gibbs, S. (2014). *The most powerful Indian technologists in Silicon Valley.* Retrieved from https://www.theguardian.com/technology/2014/apr/11/powerful-indians-silicon-valley
18. Hirst, T. (2015). What is helicopter money? *World Economic Forum.* Retrieved from https://www.weforum.org/agenda/2015/08/what-is-helicopter-money
19. International Organization for Migration. (2020). *World Migration Report 2020.* Retrieved from https://www.un.org/sites/un2.un.org/files/wmr_2020.pdf
20. Joint Research Centre (European Commission). (2018). *European Migrations: Dynamics, Drivers, and the Role of Policies*. Luxembourg: Publications Office of the European Union. doi: https://doi.org/10.2760/168653
21. Kacprzak, I. (2018). Ukraińcy w Polsce. Pracownicy ze Wschodu tylko na papierze. *Gremi Media SA.* Retrieved from http://www.rp.pl/Spoleczenstwo/303299991-Ukraincy-w-Polsce-Pracownicy-ze-Wschodu-tylko-na-papierze.html (in Pol.)
22. King, R., & Lulle, A. (2016). *Research on Migration: Facing Realities and Maximising Opportunities. A Policy Review.* Retrieved from doi: https://doi.org/10.2777/414370
23. Kolesnikova, J., Camille, R., Kamasheva, A., & Yue, Z. (2014). Current trends of realization of the intellectual capital and problems of intellectual migration. *Procedia Economics and Finance, 14,* 326-332. doi: https://doi.org/10.1016/S2212-5671(14)00720-5
24. Lee, E. (1966). A Theory of Migration. *Demography, 3*(1), 47-57. Retrieved from https://www.jstor.org/stable/2060063?seq=1
25. Lindsay, F. (2020). *Coronavirus: Migrants struggle to send money home.* Retrieved from https://www.bbc.com/news/business-52506797
26. McAuliffe, M. (2017). The nexus between forced and irregular migration: Insights from demography. *Demography of Refugee and Forced Migration,* 217-232. doi: https://doi.org/10.1007/978-3-319-67147-5_11
27. OECD I Library. (2019). *Education at a Glance 2019. OECD Indicators.* doi: https://doi.org/10.1787/f8d7880d-en
28. PICUM Country Brief. (2016). *Undocumented migrants and the Europe 2020 strategy. Making social inclusion and reality for all migrants in Germany.* Retrieved from http://www.staging.picum.net/wp-content/uploads/2017/11/UndocumentedMigrantsandEurope2020StrategyinGermany_EN.pdf
29. Ratha, D. (2015). *Migration and Remittances: Recent Developments and Outlook. Special Topic: Financing for Development.* Washington: D.C., World Bank, Migration and Remittances Team, Development Prospectus Group.
30. Reidy, E. (2020). *Briefing: In search of a more humane EU migration and asylum policy.* Retrieved from https://www.thenewhumanitarian.org/analysis/2020/05/21/EU-new-pact-migration-asylum
31. Schwab, K. (2019). The Global Competitive Report 2019. *World Economic Forum.* Retrieved from http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
32. Stakanov, R. (2018). The role of regional migration policy in the development of migration processes. *Economics, Management and Sustainability, 3*(1), 70-78. doi: https://doi.org/10.14254/jems.2018.3-1.7
33. Statista. (2017). *Number of internet users worldwide from 2005 to 2017.* Retrieved from https://www.statista.com/statistics/273018/number-of-internet-users-worldwide

34. Stouffer, S. (1960). Intervening opportunities and competing migrants. *Journal of Regional Science, 2*(1), 26. doi: https://doi.org/10.1111/j.1467-9787.1960.tb00832.x
35. The World Bank. (2016). *Migration and Remittances Factbook 2016.* Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/23743/9781464803192.pdf
36. The World Bank. (2020). *The World Bank Data*. Retrieved from https://data.worldbank.org
37. Tubalkain, M. (2016). *Estonia hiring IT specialists from Ukraine.* Retrieved from https://news.postimees.ee/3624025/estonia-hiring-it-specialists-from-ukraine
38. United Nations. (2017). *International Migration Report 2017: Highlights.* Retrieved from https://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf
39. United Nations. (2019). *International Migrant Stock 2019.* Retrieved from https://www.un.org/en/development/desa/population/migration/data/estimates2/estimates19.asp
40. Vermeylen, G., Wilkens, M., Vargas Llave, O., Gschwind, L., Messenger, J., & Boehmer, S. (2017). Working anytime, anywhere: The effects on the world of work. *European Foundation for the Improvement of Living and Working Conditions*. doi: https://doi.org/10.2806/372726
41. Volpicelli, S. (2015). Who's Afraid of ... Migration? A New European Narrative of Migration. *Iai Working Papers, 15*(32), 1-26. Retrieved from http://www.iai.it/sites/default/files/iaiwp1532.pdf
42. Wiśniowski, A., & Bijak, J. (2009). Elicitation of expert knowledge for migration forecasting using a Delphi survey. *Central European Forum for Migration and Population Research Working Paper, 2.* Retrieved from https://www.researchgate.net/publication/265063497_Elicitation_of_expert_knowledge_for_migration_forecasts_using_a_Delphi_survey
43. Worldometers. (2018). *World Population by Year*. Retrieved from http://www.worldometers.info/world-population/world-population-by-year
44. World Economic Forum. (2020). *The Global Competitiveness Index 4.0.* Retrieved from http://reports.weforum.org/global-competitiveness-report-2019/competitiveness-rankings
45. Yaroshevych, M. (2014). *Forecast of migration between the EU, the Visegrad Four countries and Eastern Europe: the consequences of the abolition of the visa regime.* Center for Oriental Studies: Warsaw, Poland (in Ukr.).
46. Yayboke, E. K., & Gallego, C. G. (2019). Out of the Shadows: Shining a Light on Irregular Migration. *Center for Strategic and International Studies (CSIS).* Retrieved from https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/190826_RundeYaybokeGallego_IrregularMigrations.pdf
47. Zech, T. (2020). *Skilled personnel welcome.* Retrieved from https://www.deutschland.de/en/topic/business/the-skilled-labour-immigration-act-working-in-germany
48. Zipf, G. (1949). *Human behaviour and the principle of least effort.* Addison-Wesley Press: Cambridge, Mass.

Received 12.03.2020
Received in revised form 20.04.2020
Accepted 26.04.2020
Available online 4.06.2020
Updated version of the paper as of 27.09.2020