

Mobility 4.0

Who will prevail in the race for work  
– machines or people?

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## **Mechanical migration to find work**

Over the course of two decades, the technological revolution will change the world more than over the last two centuries. Will a working human being adapt to the astronomical rate of spread of robotics, automation of production and inevitable expansion of artificial intelligence? How are we to raise and educate children, knowing that when they reach adulthood most of them will practice a profession that does not yet exist? Who will be forced to set out in the search for *panem et circenses* and a better life, and when, and where will they go?

Autonomous, self-sufficient, maintenance-free, virtual. These are only some of the terms that will now forever dominate the minds of management specialists and also engineers and information technology consultants designing products and services in the XXI century. Globalisation and progress will define anew future labour markets, local and regional.

Will countries in the CEE region be able to stand up to the more developed countries, considering the fact that they are losing the virtue of having a cheaper workforce? How will the thousands of people migrating from Africa and the East and the growing army of ever younger retirees change the map and the structure of the world of labour? Does economy 4.0 have a chance of developing in Poland? In what way should human capital even be built and supported? How can the top talent be identified and what should they be offered so that when they are entering the job market they have an equal chance of getting cross-border jobs as their rivals from the USA, Scandinavia, or Asia?

The answers to some of these questions can be found in our report on the key changes in the age of the fourth technological revolution from the point of view of worker mobility. Like other countries in the region, Poland irrevocably lost the portion of capital consisting of educated, creative and enterprising people. More are planning to leave, many with a one-way ticket. Should they be retained, and how? We should be thinking about this now, otherwise, eventually, machines will do that for us...

Pleasant reading!

**Sebastian Kulczyk**

## **Chip Espinoza**

Millennial expert, best-selling author

Immigration can become one of the more effective instruments of a labour market as it can eliminate negative demographic trends. As it had been proved in previous editions of the reports for CEED Institute, the CEE countries are presently facing serious demographic challenges. They are caused by low birth rates as well as emigration of working-age persons. Problems which are especially noticeable appeared in labour markets, where we already have a serious deficit in the labour force. In the future those problems will grow stronger. The surplus of immigration over emigration expressed as the migration bottom line becomes one of the more important measures of migration and of the demographic situation of countries.

A greater dependence upon immigration will require more focus on the integration of and knowledge transfer to immigrant workers—especially tacit knowledge. Tacit knowledge is knowledge that is not written down and is primarily acquired through experience. A study by the Social Welfare Institute of Boston College suggests the world is in the midst of the largest transfer of wealth in history. Arguably, the same could be said about the transfer of knowledge. Those institutions who are able to transfer knowledge to the emerging generation will be the big winners.

When speaking of integration and knowledge transfer attention must not only be given to communication and socio-cultural challenges but generational factors as well. As seasoned workers age-out of the labour force and a new generation enters, it can provide opportunity for both conflict and renewal. Norman Ryder<sup>1</sup> (1965) referred to the process as demographic metabolism. The phenomenon is accentuated today by the second largest generation (Baby Boomer) giving way to the largest (Millennials) and their older colleagues (Gen X). Understanding generational dynamics will be instrumental to ensuring demographic metabolism results in regeneration and vitality. Therefore, it is incumbent upon the people who have the most responsibility in an organization be the first to adapt to a changing labour environment—particularly when it comes to integrating young professionals. There are two key areas to attend to with respect to successfully integrating and transferring knowledge to young labour; 1) the quality of relationship they have with their manager, and 2) having plan for their career advancement—the love language of young professionals is career development.

<sup>1</sup> Ryder, N. B. (1965). *The cohort as a concept in the study of social change*. *American Sociological Review*, 30(6), 843-861.

**prof. Paweł Kaczmarczyk**

Director, Centre of Migration Research, University of Warsaw

The report was created at an unusually interesting moment in history, which undoubtedly influences its cognitive value. Nowadays, technological changes typical for every historical moment acquire a new dimension and increase in dynamics hitherto unknown. We live in an era of general digital revolution; we are increasingly surrounded by “digital clouds” and the “internet of things”, we are confronted by robots replacing workers and perhaps ultimately “stealing” their jobs. No matter if and to what extent we will be able to adapt to those changes on social level, they will transform labor markets, including those which attract foreign labor.

The great value of the report is that it concentrates on the countries of Central and Eastern Europe. The reader therefore receives up-to date knowledge on the most recent trends in migration, and these are unquestionably interesting. The countries of the region, although with great effort, are participating in the global struggle for highly qualified workers but – at least some of them – have started to attract on a large scale workers for seasonal and casual tasks. The case of Poland is the most spectacular in this context, and probably the most interesting.

First of all, owing to this report the reader will be able to answer the question of what the effects of deep technological changes for labor markets in EU new member states might be, as well as the role of migration in that process. The answers are by no means obvious and the author do not offer simplified answers. They rather provide prerequisites and material for analysis in order to formulate one’s own view of the reality studied. As a matter of fact, the situation is in many respects more complicated than in the countries of Western Europe. Demographic processes are much more dramatic (in the sense of their dynamics), public policies are less effective and, in addition many countries built their comparative advantages based on cheap labor. And this labor force in many sectors may turn out to be redundant in ten years or so. Thus, it is of key significance to identify the sectors that in the face of technological revolution will continue to generate jobs, including those successfully performed by immigrants. Regardless of its general concentration on the high technology sectors, the report also pays attention to sectors that do not undergo technological changes so easily. Construction, personal services and agriculture are mentioned. In most countries these are nowadays typically second-rate sectors, attractive primarily for immigrants. Analyses presented in the report indicate that this situation may deepen and this in turn will make the search for new sources of foreign labor a question of great importance.

# Introduction

We are being afflicted with a new disease of which some readers may not yet have heard the name, but of which they will hear a great deal in the years to come – namely, technological unemployment. This means unemployment due to our discovery of means of economising the use of labour outrunning the pace at which we can find new uses for labour.<sup>1</sup>

**John Maynard Keynes, 1930**

Over eighty years ago, one of the most important economists of the 20<sup>th</sup> century, J.M. Keynes, foresaw the changes that would occur as a result of intensive technological development. In 1930, he wrote about technological unemployment which would increase as a consequence of supplanting human labour by machines. In the following decades, many works were written, whose authors attempted to predict the extent and direction in which labour markets would develop under the influence of successive industrial and technological revolutions.

A particular role in this debate was played by Jeremy Rifkin's book entitled "The End of Work: The Decline of the Global Labour Force and the Dawn of the Post-Market Era". The American economist and political scientist outlined the picture of an era when great numbers of people would lose their jobs as computers, robots and artificial intelligence became more and more common. For many years the book was criticized and considered to be a futurological work. However, 22 years after it was first published, the question arised whether the threat of full automation of work will become a real problem for labour markets all over the world?

Until now, no analysis or research took into account the impact of those changes on migration and labour mobility. In this report an attempt is made to approach the problem of mobility in the era of intensive development of new technologies, with advanced machines and robots coming into use. We have every reason to expect that in the era of the fourth industrial revolution migrations will take on a new character. Not only might the directions of migration movements change but also the duration and even the perception. Digitization of life also increasingly affects the growing population of migrants.

The question worth asking is whether the 21<sup>st</sup> century changes in the world of labour will affect all groups of workers equally. In the fourth report on migrations particular attention will be paid to the impact of automation and computerization in relation to migratory processes. The report aims to show the ways in which changes in the fourth industrial revolution together with growing interest in migrations may shape the situation on the labour markets of the CEE countries. At the same time, attention will be paid to the question of how technological changes might affect international migration. Will immigrants arriving in CEE countries lose jobs due to automation and robotization? Universal access to new technologies will encourage workers to mobility which will take on a more fluid character. Migration connected with permanent change of residence and work will give way to short-term movement of workers around the world.

<sup>1</sup> J. M. Keynes, *Economic Possibilities for our Grandchildren*, <https://www.marxists.org/reference/subject/economics/keynes/1930/our-grandchildren.htm>

## **The report is divided into 5 chapters:**

The first chapter is of strictly statistical character. In terms of statistical data, it shows the most significant changes which migration in the EU Member States has undergone. Particular attention was paid to recent trends in migration in CEE countries. Data have been presented indicating the general share of non-nationals in particular societies, and the scale of labour migrations as well as the influx of immigrants from third countries seeking international protection in the EU.

The second chapter presents the main types of mobility observed in the first decades of the 21<sup>st</sup> century. Emphasis has been put on the differences in migration policy within the EU, namely the division between the citizens of third countries and citizens of EU Member States, who benefit from the freedom of movement. Particular attention was paid to such categories of mobile workers as posted workers, expatriates, digital nomads and the bearers of the Blue Card.

The third chapter gives general characteristics of the most important phenomena in the labour markets connected with robotization and automation of work. Results of the most often discussed research have been presented showing the extent to which robots and computers may take work away from humans. At the same time, the attitudes of the most important actors in the fourth industrial revolution have been presented in the current debate on technological unemployment which is expected to increase in the future.

The fourth chapter shows the directions that migratory movements might take on a world scale, in Europe and in CEE countries. It has been shown that in the immediate future the migration potential will be decreasing in those countries where the largest number of foreign workers in the CEE countries originates.

The fifth chapter shows the results of the author's research carried out among experts dealing with the problems of labour market, and with social and economic policy as well as new technologies. The representatives of eleven different research, political and educational institutions indicated the most important changes, threats and possible consequences resulting from the processes of digitization of the economy. Particular attention has been paid to occupations which are most and least threatened by automation and robotization. The relevant subject of the interviews concerned the impact of the changes mentioned on international migration as well as labour mobility.

### **Acknowledgments**

I would like to express my gratitude to all who contributed to the production of this report. Special thanks to Professor Paweł Kaczmarczyk, who reviewed it, to Anna Kuczyńska and Patrick O'Connor, who translated it, and to Mariusz Serdak, who prepared the copy editing.

## Chapter I

Immigration to the CEE countries

– immigration crisis and what next?

## **Introduction**

For some years migration movements within the European Union have been one of the most important political, social, economic and cultural topics. In 2015 and 2016, the history of those countries recorded the most serious migration crisis of the EU. The uncontrolled influx of refugees from countries of North Africa and the Middle East, together with a lack of consensus among Member States about the kind of help to offer them exposed serious problems in migration and asylum policy. Tens of thousands of refugees arriving in Europe put a question mark to the agreement on values and ideas upon which the community of European countries was built in the second half of the 20<sup>th</sup> century.

The increasing number of foreigners looking for international protection coincided with internal troubles and problems concerning the right to free movement of persons. Among leading politicians a division into Euro-enthusiasts and Euro-skeptics is more and more noticeable, especially with regard to foreigners from non-European countries. The activities of the countries of Central and Eastern Europe provide an example of isolation from the problems of people seeking refuge and from parallel opening for controlled economic migrations.

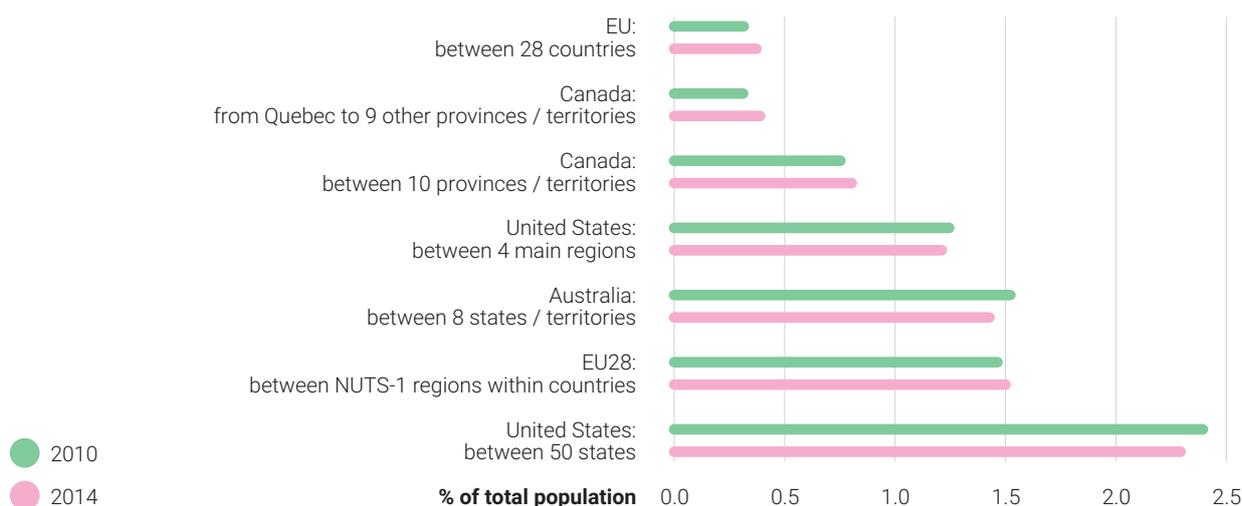
What is presented in this chapter is the image of migration movements to the countries of Central and Eastern Europe which took place in 2016. As in previous CEED Institute's reports, its purpose is a broad look at the resource of foreigners in particular countries of the region as well as their most important movements within the region. The juxtaposition of the migrations in the so-called EU-15 countries with those in Central-Eastern Europe will let us show the specifics of the migration flows in the countries which joined the EU after 2004. In addition the latest data will be presented showing the size of the refugee migrations which express both the scale of the problems as well as the attractiveness of particular member countries. This chapter is of statistical character and the data used in it come from comparative data collected by Eurostat, International Organization for Migration (IOM) and United Nations High Commissioner for Refugees (UNHCR).

## Foreigners in the EU Member States

According to IOM estimates, in 2015 the population of immigrants on a world scale amounted to 244 million people. On the map of world migration the EU is an exceptional example of close cooperation of 32 states (28 Member States with European Economic Area and Switzerland) involving most areas of socio-economic life. The most characteristic cornerstone of that community of more than 500 million people is the guarantee to all its inhabitants of the right to freedom of movement and to education and employment in a member country other than their own. However, the data on [Chart 1.1](#) show a low degree of mobility of employees within the EU. In 2014, less than 0.5 per cent of the population of 28 EU Member States lived in a country other than their own. Much more mobile in 2010 and 2014 were employees in the United States, Australia and Canada. Greater mobility of employees from EU-28 is noticed within the member countries, i.e. on the level NUTS 1.

**Chart 1.1**

Annual cross-border mobility as a percentage of total population in EU, Canada, United States and Australia in 2010 and 2014



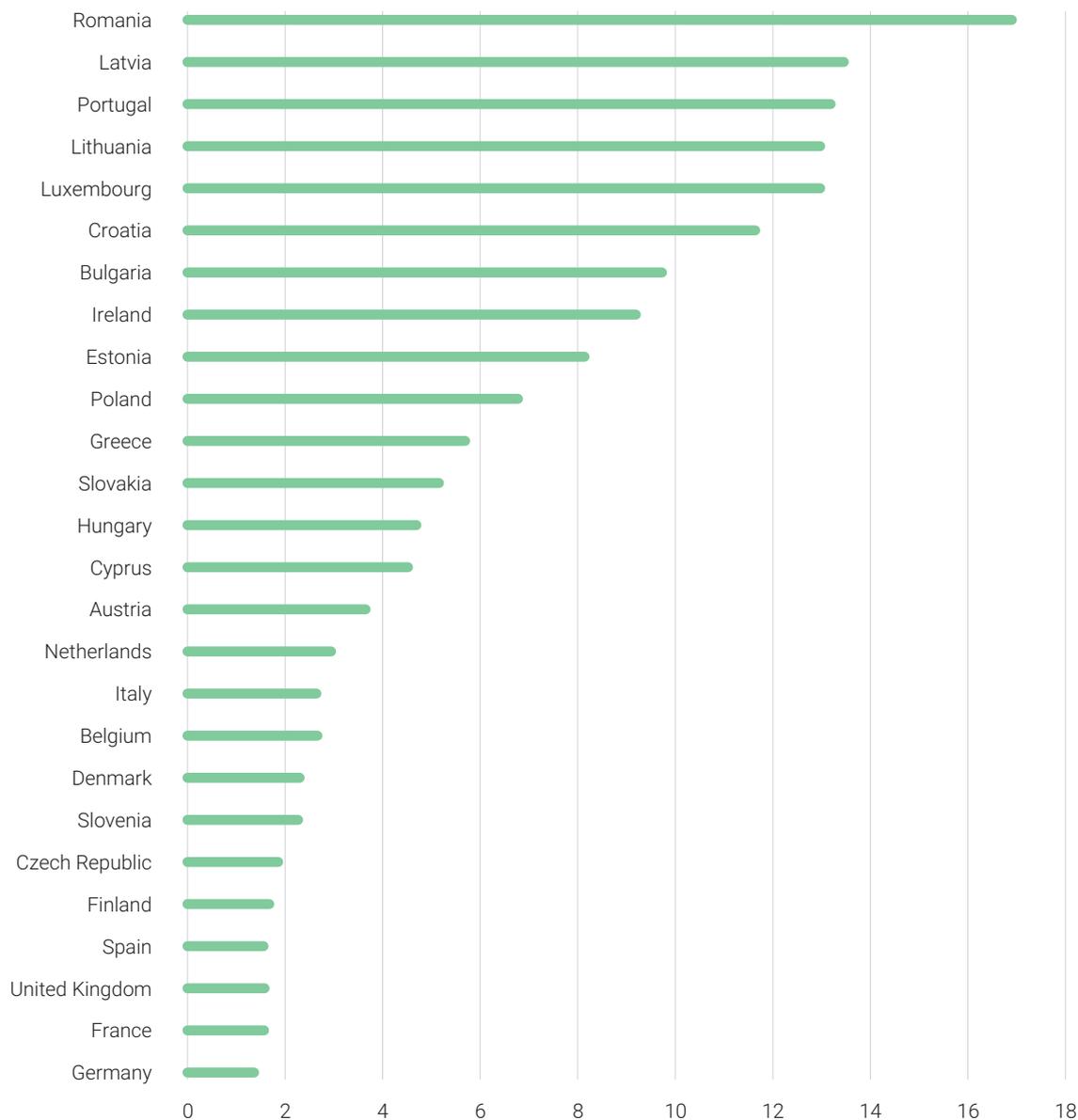
Source: European Commission, 2016 Annual Report on intra-EU Labour Mobility, 2017.

The first years after the access of the eight CEE countries to the European Union were dominated by mass migrations of working-age people. Tens of thousands of young people took the opportunity to look for better conditions of life, work and education in other EU countries. Soon, the Poles became the most mobile nation in the enlarged EU, heading, first of all, to Great Britain and Germany. The [Chart 1.2](#) shows how great the losses of particular EU countries are in the working-age population as the result of emigration. In 2015, as many as 17 per cent of the citizens of Romania in the age bracket 20-64 lived outside their country. As early as in 2008, i.e. one year after they joined the EU, the citizens of Romania were referred to as the most mobile nation in EU<sup>2</sup>. Among other CEE countries from which great numbers of people emigrated to work were Latvia and Lithuania (each 13%), and Croatia (about 12%). The smallest deficit of population of potential workers was noted in the Czech Republic. Further increase in mobility of working-age people in the countries facing the deficit in working population may deepen troubles in their labour markets.

<sup>2</sup> D. Andren, M. Roman, *Should I Stay or Should I Go? Romanian Migrants during Transition and Enlargements*, Discussion Paper Series IZA DP No. 8690, December 2014.

Chart 1.2

Mobility rate of nationals of working age (20-64) in EU Member States in 2015 (in %)



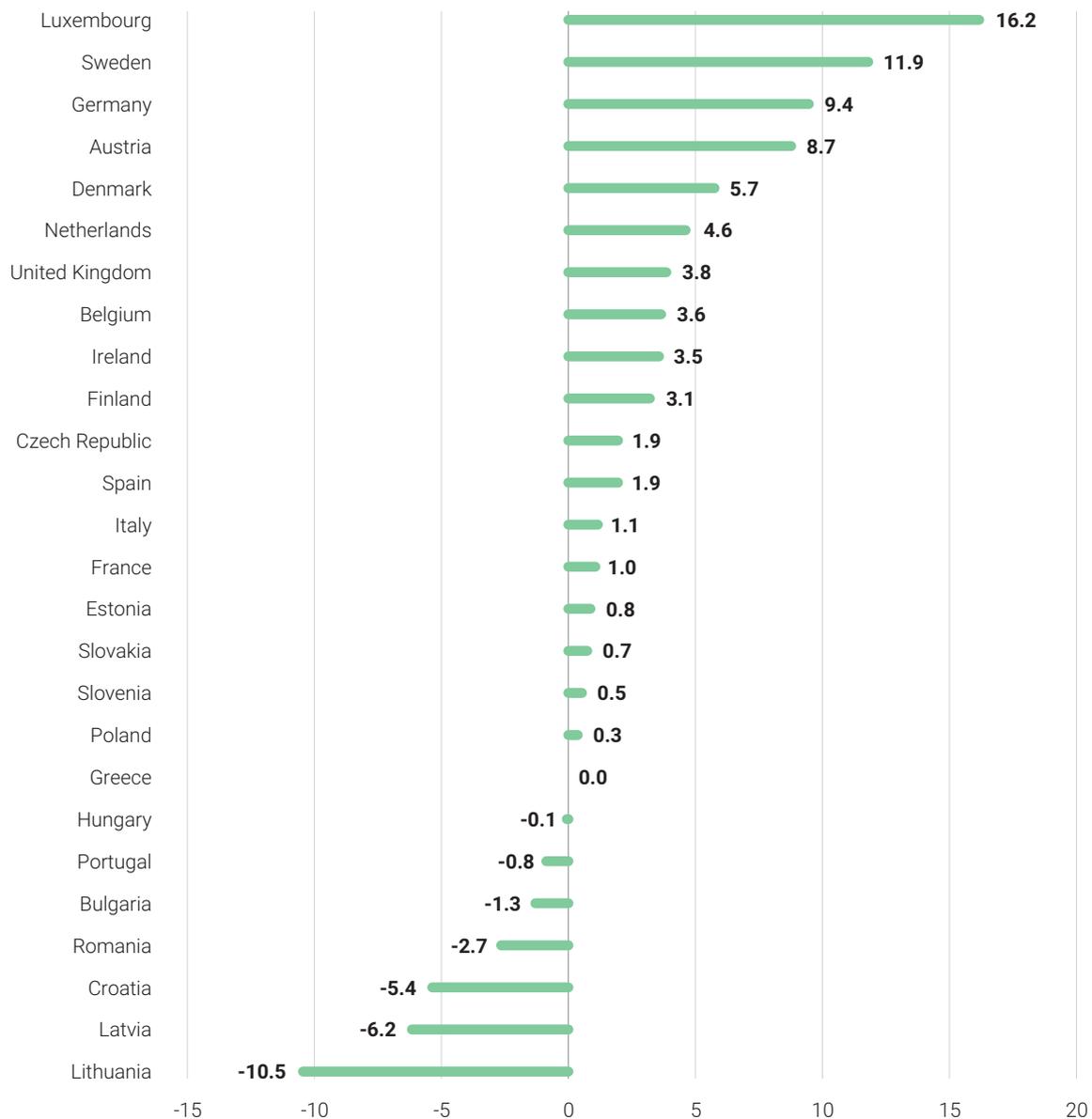
Source: 2016 Annual Report on intra-EU Labour Mobility, European Commission 2017.

### Emigration without immigration – the balance of migration flows

Immigration can become one of the more effective instruments of a labour market as it can eliminate negative demographic trends. As it had been proved in previous editions of the CEED Institute' reports, the CEE countries are presently facing serious demographic challenges. They are caused by low birth rates as well as emigration of working-age persons. Problems which are especially noticeable appeared in labour markets, where we already have a serious deficit in the labour force. In the future those problems will grow stronger. The surplus of immigration over emigration expressed as the migration bottom line becomes one of the more important measures of migration and of the demographic situation of countries.

Chart 1.3

Crude rate of net migration plus adjustment per 1,000 inhabitants in EU Member State in 2016



Source: Eurostat, Crude rate of net migration plus adjustment (tsdde230).

Data from the [Chart 1.3](#) prove again that there are enormous differences in migration situations among the EU-28 Member States. They show the difference between emigration and permanent immigration, i.e. immigration lasting more than 12 months. It is also worth noting that in the years 2014-2017 Poland came to the forefront of countries with positive balance of seasonal migrations. The best situation, i.e. positive migration bottom line is characteristic for the richest and most attractive countries: Luxembourg, Sweden, Germany and Austria. Among the CEE countries the surplus migration balance in 2016 was noted in the Czech Republic, Estonia, Slovakia, Slovenia and Poland.

The greatest surplus of emigration over immigration was noted in Lithuania, where a deficit of 10 persons per 1,000 were reported. This is a particular threat to a country of three million people. Due to negative population growth and high balance of emigration Lithuania is the fastest depopulating country in the EU<sup>3</sup>.

### EU citizens or third country nationals – who migrates most often to CEE countries?

For some years growing interest has been noted in immigration both to and within the EU. In 2016, 20.8 million citizens of other countries were living in the EU. Just over 16.0 million were the citizens of Member States who enjoyed the right to free movement within the EU. Compared with 2015 those numbers had grown respectively by 750,000 for the population of EU citizens free to move and by 1,000,000 for citizens of non-member countries. The difference is especially noticeable in the CEE countries. This may result from the geographical location of those countries bordering on Russia, Ukraine and countries of the Balkan Peninsula.

According to IOM data in 2015, Germany was the second-most preferred destination in the world for immigrants, preceded only by the USA. In 2016, 8.6 million foreigners resided in Germany, which means every tenth inhabitant had foreign roots (Table 1.1). Among the EU-15 Member States Luxembourg is especially distinguished, where nearly every second inhabitant is a foreigner.

Table 1.1  
Share of foreigners in EU-15 in 2016

Country	EU-28		Non EU-28		Total
		% of total population		% of total population	
Belgium	875,878	7.7	450,827	4.0	11.7
Denmark	189,375	3.3	267,192	4.7	8.0
Germany	3,801,044	4.6	4,840,650	5.9	10.5
Ireland	384,045	8.1	201,141	4.3	12.4
Greece	206,664	1.9	591,693	5.5	7.4
Spain	1,933,831	4.1	2,482,814	5.3	9.4
France	1,529,120	2.3	2,879,440	4.3	6.5
Italy	1,517,023	2.5	3,508,429	5.8	8.3
Luxembourg	229,506	39.8	39,618	6.9	46.7
Netherlands	458,705	2.7	367,744	2.2	4.9
Austria	615,634	7.1	629,834	7.2	14.3
Portugal	105,231	1.0	283,500	2.7	3.7
Finland	94,202	1.7	133,136	2.4	4.1
Sweden	303,988	3.1	447,664	4.5	7.6
United Kingdom	3,204,628	4.9	2,436,046	3.7	8.6

Source: Eurostat, Population on 1 January by age group, sex and citizenship [migr\_pop1ctz].

<sup>3</sup> K. Matuszczyk, *Migracje zarobkowe w Europie Środkowo-Wschodniej*, INFOS, Warszawa 2017.

The CEE countries, in spite of common historical background in recent decades and in spite of similar socio-economic circumstances, vary greatly with regard to their attractiveness for foreigners (Table 1.2). The country with greatest percentage of foreigners is Estonia, in which every seventh resident (15.1%) had the citizenship of another country. Most states of the region have a homogenous nationality structure. In eight of them, persons of foreign origin are about 1 per cent of the total population. The country in which the smallest proportion of long-term immigrants (above 12 months) has been recorded for some years is Poland. It amounts to 0.3-0.5 per cent of total population.

Table 1.2  
Share of foreigners in CEE countries in 2016

Country	EU-28		Non EU-28		Total
		% of total population		% of total population	
Bulgaria	13,112	0.2	58,807	0.8	1.0
Czech Republic	195,438	1.9	280,907	2.7	4.6
Estonia	15,372	1.2	182,266	13.9	15.1
Croatia	13,474	0.3	26,678	0.6	0.9
Latvia	5,974	0.3	282,792	14.4	14.7
Lithuania	4,949	0.2	12,311	0.4	0.6
Hungary	85,143	0.9	71,062	0.7	1.6
Poland	25,091	0.1	123,926	0.3	0.4
Romania	48,030	0.2	58,858	0.3	0.5
Slovenia	17,597	0.9	90,169	4.4	5.3
Slovakia	50,440	0.9	13,901	0.3	1.2

Source: Eurostat, Population on 1 January by age group, sex and citizenship [migr\_pop1ctz].

The country which took the lead in the CEE region is the Czech Republic. In mid-2017 that country had the smallest unemployment rate of all EU Member States. It amounted to 3 per cent. Also, the previous analyses have indicated that, due to its socio-economic situation, that country may be considered the most attractive destination for immigrants among all the CEE countries. The main group of immigrants in the Czech Republic are the Slovaks which is the result of close historical and economic relationships between the two countries. Due to favorable circumstances in the labour market and better earnings, in 2016 Czech entrepreneurs intensified recruitment of workers from Poland. According to the estimates of Work Service, in 2016, that firm recruited as many as 100 workers a week to the production sector, in which the demand for additional labour is the greatest. Monthly pay in Czech firms amounts to 2500-3700 PLN net, which is much more than the average pay in Poland.

Source: Work Service, Praca w Czechach kusi Polaków,  
<http://www.workservice.com/pl/Centrum-prasowe/Informacje-prasowe/Ekspert-HR-komentuje/Praca-w-Czechach-kusi-Polakow>

### **Not only in search of work, or residence permits in the CEE countries**

The relevant information about immigration of citizens from non-EU countries is derived from “first permits” data. The total number of residence permits issued in EU countries in 2016 amounted to 3.3 million. That was an increase of 23 per cent over 2015. The largest number of residence permits was issued in Great Britain – 865,894. The second-largest was in Poland, 585,969 documents issued (Table 1.3); Poland has been the leader in the region since 2010. The next CEE country with the greatest number of residence permits issued in 2016 was the Czech Republic – over 80,000 documents. What’s characteristic for this migration is the geographic and cultural proximity of the immigrant’s country of origin. Most foreigners in CEE countries come from Ukraine and Russia or from one of the countries bordering on the country of destination. The second-largest group to whom residence permits were issued came from remote countries: Vietnam, China and India.

People apply for residence permits in CEE countries for variety of reasons. Employment is the main reason in Poland (84%), Lithuania (61%) and Croatia (50%). In Romania and Hungary educational reasons prevail, while in Bulgaria, Estonia and Latvia family-related factors were indicated most often. Most residence permits were issued for a period longer than 12 months. Poland is the country which stands out in the region. Here one group of foreigners, namely Ukrainians, outnumber the other groups. Their grounds for applying for residence permits are work-related; their migration is short term (not more than 11 months).

**The attractiveness of Poland on the map of economic migrations is proved by data concerning seasonal employment. According to data from the Ministry of Family, Labour and Social Policy, in 2016, 1.3 million documents were registered declaring the intention of giving employment to a foreigner. 90 per cent of them are the Ukrainians who make up the basic stock of seasonal workers, especially in agriculture, building and ordinary services. According to the latest Centre for Migration Research data, the average immigrant from Ukraine was five times in Poland. More and more often, however, migration of people who have no children is being observed. This may mean that a great part of them will have no motivation for returning to Ukraine.**

Source: NBP, Obywatele Ukrainy pracujący w Polsce – raport z badania,  
[https://www.nbp.pl/aktualnosci/wiadomosci\\_2016/20161212\\_obywatele\\_ukrainy\\_pracujacy\\_w\\_polsce\\_%E2%80%93raport\\_z\\_badania.pdf](https://www.nbp.pl/aktualnosci/wiadomosci_2016/20161212_obywatele_ukrainy_pracujacy_w_polsce_%E2%80%93raport_z_badania.pdf)

Table 1.3  
First permits by grounds in CEE countries in 2016

Country	Total in 2016	2015 / 2016 in %	Main countries	Reason				Duration		
				Employment	Education	Family	Other	3-5 m.	6-11 m.	12+ m.
<b>Bulgaria</b>	7,942	-17	Turkey (36%) Russia (19%) Ukraine (14%)	4	13	41	42	7	37	56
<b>Czech Republic</b>	80,070	+16	Ukraine (30%) Russia (15%) Vietnam (10%)	29	21	31	19	11	11	78
<b>Estonia</b>	4,308	+8	Ukraine (25%) Russia (24%)	31	26	33	10	3	9	88
<b>Croatia</b>	5,315	+55	Bosnia and Herzegovina (45%), Serbia (13%), FYR of Macedonia (5%)	50	10	31	9	10	23	67
<b>Latvia</b>	6,037	-5	Russia (27%) Ukraine (24%) India (8%)	29	22	36	13	4	78	18
<b>Lithuania</b>	6,750	+30	Ukraine (42%) Belarus (18%) Russia (14%)	61	14	17	8	1	13	86
<b>Hungary</b>	22,842	+10	China (13%) Ukraine (10%) Turkey (6%)	26	34	21	19	11	33	56
<b>Poland</b>	585,969	+8	Ukraine (88%) Belarus (5%) Moldova (1%)	84	6	1	9	42	50	8
<b>Romania</b>	11,867	+5	Moldova (18%) Turkey (10%) China (8%)	15	39	33	13	8	15	77
<b>Slovenia</b>	13,517	+18	Bosnia and Herzegovina (47%) Serbia (18%) Kosovo (10%)	51	13	34	2	8	38	54
<b>Slovakia</b>	10,227	+10	Ukraine (30%) Serbia (20%) Russia (7%)	35	17	25	23	11	17	23

Source: Eurostat, First permits by reason, length of validity and citizenship [migr\_resfirst].

## Return migrations - hope for improving demographic conditions

According to Eurostat methodology, return migrations are a part of migration flows to a particular country. A person referred to as return migrant is someone who immigrated back to his/her country of origin. The data however, only take into account persons who return after the period longer than 12 months. As it results from the data in [Table 1.4](#), it is difficult to prove any clear trend in those migrations to CEE countries. In 2015, most of the returning nationals were in Romania and Poland. They were respectively 87 per cent and 39 per cent of all immigrants. In most CEE countries for some years, return migrations have remained at the level of no more than 10,000 persons per year. Those who return most often are persons in the age bracket 25-44 years, who are the most valuable stock of workers from the perspective of local labour markets. However, we have no sufficient data allowing to fix the countries from which those immigrants return. According to data of the British statistical office (ONS), leaving a country by citizens of the CEE region in 2014 was first of all related to employment. The threat of terrorism in typical countries of immigration as well as an improving economic situation in countries of emigration may both contribute to an increase of return migrations to the CEE countries.

Table 1.4  
Return migration in CEE countries in 2013-2015

Country	2013		2014		2015	
	Returns	% of immigrants	Returns	% of immigrants	Returns	% of immigrants
<b>Bulgaria</b>	4,682	25	9,502	36	10,722	43
<b>Czech Republic</b>	5,326	18	5,759	19	4,478	15
<b>Estonia</b>	2,472	60	2,557	65	8,043	52
<b>Croatia</b>	5,085	49	4,824	45	6,483	55
<b>Latvia</b>	4,774	58	5,864	57	4,974	52
<b>Lithuania</b>	18,975	86	19,528	80	18,383	83
<b>Hungary</b>	17,718	45	28,577	52	32,557	56
<b>Poland</b>	131,431	60	127,780	57	84,784	39
<b>Romania</b>	138,923	90	123,916	91	115,485	87
<b>Slovenia</b>	2,250	16	2,535	18	2,755	18
<b>Slovakia</b>	2,674	52	2,939	55	3,223	46

Source: Eurostat, Immigration by age group, sex and citizenship [migr\_imm1ctz].

## **The refugee crisis is still there – or how many persons choose the EU in search of international protection?**

It is estimated that in the years between 2009 and 2014 there were 15 conflicts in the world whose immediate consequence were forced resettlements and flight of millions of people. Most of these conflicts took place in Africa. Additional humanitarian problems and demographic explosion are the main factors pushing the residents of that continent out of their homelands. According to UNHCR, in 2016, the refugee population in the world amounted to more than 17 million people<sup>4</sup>.

The EU Member States are not the main destination for refugees fleeing persecution and threats to their lives. According to UNHCR data, as many as nine out of ten refugees find shelter in developing countries bordering their country of origin. These states to which the asylum seekers escape face their own problems of development and are not able to ensure sufficient care to all who need it. In 2016, most refugees were in Lebanon, at a distance of 450 km from EU borders; every sixth resident of that country was a refugee. The key situation from the perspective of the EU is that of the refugees in Turkey, where there are nearly three million of them.

The refugee crisis which dawned on the consciousness of Europeans at the turn of 2014 and 2015 is in the Mediterranean and in the border regions of the EU. In the first half of 2017, more than 111,000 immigrants arrived in Europe by sea, which was however half of the number for the same period in 2016. Although the number of people seeking refuge in Europe at all costs clearly decreased, in the first half of 2017 2,359 of them lost their lives. The challenges connected with receiving refugees are not evenly distributed among EU Member States – in 2017 84 per cent of those immigrants reached Italy, 9 per cent Greece and 7 per cent Spain. However, those countries are not the target countries for asylum seekers. The data in Table 1.5 show that most applications for asylum (refugee status) in 2016 and the first quarter of 2017 were submitted in Germany. As in 2015, Germany remains the most attractive destination for refugee migrations. Although at the beginning of 2017, the number of applications in most EU-15 States decreased noticeably, it can be assumed that it will grow at the end of the year.

**Germany is the country in which refugees are considered a potential solution of labour market problems. Many businessmen are willing to employ them in their factories, among others in the auto industry. Part of those who support the idea of accepting asylum seekers are of the opinion that money invested in integration programs will soon be recovered. According to the German BAMF, in 2016, 16.6 per cent of asylum seekers had higher education, persons with secondary education prevailed (30.6%). Every tenth person had no formal education. The best educated group are Iranians (29.6% with higher education), and Syrians (22%).**

Source: NBP, Obywatele Ukrainy pracujący w Polsce – raport z badania,  
[https://www.nbp.pl/aktualnosci/wiadomosci\\_2016/20161212\\_obywatele\\_ukrainy\\_pracujacy\\_w\\_polsce\\_%E2%80%93raport\\_z\\_badania.pdf](https://www.nbp.pl/aktualnosci/wiadomosci_2016/20161212_obywatele_ukrainy_pracujacy_w_polsce_%E2%80%93raport_z_badania.pdf)

<sup>4</sup> UNHCR, <http://www.unhcr.org/figures-at-a-glance.html>

Table 1.5  
Number of asylum-seekers in EU-15 in 2016 and Q1 2017

Country	2016				2017
	Q1	Q2	Q3	Q4	Q1
<b>Belgium</b>	5,725	3,450	4,360	4,745	4,485
<b>Denmark</b>	3,030	1,245	1,000	895	690
<b>Germany</b>	201,235	209,910	251,440	83,015	54,600
<b>Ireland</b>	550	450	580	670	605
<b>Greece</b>	5,595	12,235	12,665	20,610	16,865
<b>Spain</b>	2,930	4,000	3,570	5,260	6,865
<b>France</b>	20,505	20,285	21,800	21,675	23,785
<b>Italy</b>	22,570	27,110	34,975	38,305	37,435
<b>Luxembourg</b>	515	430	545	665	720
<b>Netherlands</b>	5,930	3,485	5,590	5,940	4,145
<b>Austria</b>	14,390	11,255	9,080	7,520	6,470
<b>Portugal</b>	295	440	330	400	655
<b>Finland</b>	2,225	1,075	1,345	960	1,110
<b>Sweden</b>	9,105	6,190	6,865	6,630	5,645
<b>United Kingdom</b>	10,150	9,915	9,345	9,380	8,530
<b>EU-28</b>	321,620	337,280	380,625	220,425	180,190

Source: Eurostat, Asylum and first time asylum applicants by citizenship, age and sex Monthly data (rounded) [migr\_asyappctzm].

Table 1.6  
Number of asylum-seekers in CEE countries in 2016 and Q1 2017

Country	2016				2017
	Q1	Q2	Q3	Q4	Q1
<b>Bulgaria</b>	4,200	3,645	6,435	5,140	1,335
<b>Czech Republic</b>	420	350	365	350	355
<b>Estonia</b>	15	60	45	55	65
<b>Croatia</b>	270	400	690	855	170
<b>Latvia</b>	35	90	80	145	160
<b>Lithuania</b>	50	70	145	170	60
<b>Hungary</b>	7,185	15,305	4,385	2,560	1,290
<b>Poland</b>	2,875	4,520	2,975	1,930	1,665
<b>Romania</b>	230	215	450	990	645
<b>Slovenia</b>	490	120	275	420	195
<b>Slovakia</b>	20	35	40	50	60

Source: Eurostat, Asylum and first time asylum applicants by citizenship, age and sex Monthly data (rounded) [migr\_asyappctzm].

The CEE countries are not the main country of destination for those who seek international protection in the UE. Only in Bulgaria, Hungary and Poland were several thousand asylum applications reported in 2016 (Table 1.6). In the first quarter of 2017, there was a considerable decrease of applications compared with the same period of the previous year. Lack of interest in this region of Europe is, primarily the result of official attitudes of governments which openly expressed their objections against accepting “strangers”, “Islamists” or “terrorists”.

The wave of mass refugee migration after 2014 was dominated by the citizens of three countries. Always the same three nations are mentioned: the Syrians, the Afghanis and the Iraqis, who altogether made up more than 50 per cent of asylum seekers in the EU (Table 1.7). However, the EU countries were not their main destination, because in their countries of origin they were only a small part of those escaping. The scholars studying migrations noticed, that quite a large part of the refugees from Syria who arrived in the first phase of the so-called migration crisis belonged to the well-off and educated population. Many of them were doctors, bankers, and other professionals of high qualifications sought after on the European labour market<sup>5</sup>. Among the 10 most numerous groups seeking international protection in 2016 were also the Albanians, who submitted more than 30,000 applications for asylum. They are so-called economic refugees not entitled to any international protection. Their migration is caused by the socio-economic instability of their country which in no way threatens their lives or health.

**Table 1.7**  
Main countries of origin of third-country asylum seekers in the EU-28 in 2016

	Country	Number of applicants	% of total applicants
1.	<b>Syria</b>	339,265	27
2.	<b>Afghanistan</b>	186,595	15
3.	<b>Iraq</b>	130,015	10
4.	<b>Pakistan</b>	49,840	4
5.	<b>Nigeria</b>	47,710	4
6.	<b>Iran</b>	41,340	3
7.	<b>Eritrea</b>	34,480	3
8.	<b>Albania</b>	32,335	3
9.	<b>Russia</b>	27,605	2
10.	<b>Somalia</b>	20,050	2

Source: Eurostat, Asylum and first time asylum applicants by citizenship, age and sex Monthly data (rounded) [migr\_asyappctzm].

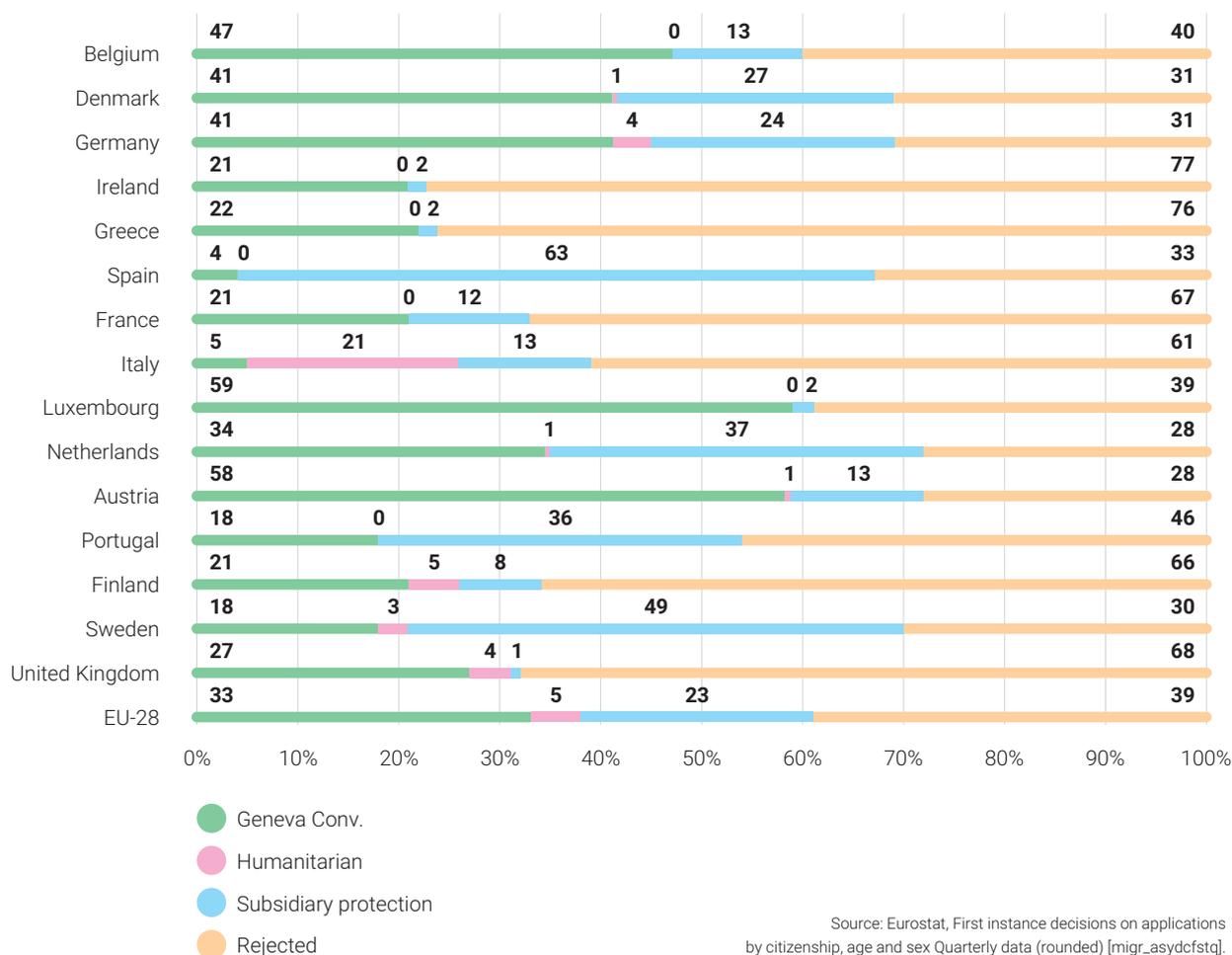
Those seeking international protection can apply on one of the forms provided for in international law, in the law of EU and in the laws of particular Member States. The most important document regulating the definition of a refugee is the 1951 Geneva Convention (amended by the 1967 New York Protocol). In accordance with the principle of “non-refoulement”, a refugee cannot be expelled from the country where he seeks protection and forcibly returned to the country he fled from. The forms of protection include refugee status, subsidiary protection and temporary protection. Refugee status is granted to those immigrants who have well-founded fear of being persecuted in their country of origin for reasons of their: race, religion, ethnicity/nationality, political opinions or membership of particular social group and therefore they are unable or unwilling to be protected by that state.

A foreigner is granted subsidiary protection if, when returning to the country of origin, he is in real danger of serious harm by: death sentence or execution, torture, inhuman humiliating treatment or punishment, serious and individual threat to life and health resulting from violence commonly applied to civil population in a situation of international or internal armed conflict, and owing to that risk is unable or unwilling to avail himself of the protection of the country of origin.

<sup>5</sup> M. Duszczuk, *Solidarność to za mało*, w: „Uchodźcy”, Warszawa 2015, s.159; J. Mchugh, *Europe Refugee Crisis Facts: Wealthy, Educated Syrians Risking Lives To Leave War*, 2015, <http://www.ibtimes.com/europe-refugee-crisis-facts-wealthy-educated-syrians-risking-lives-leave-war-2089018>

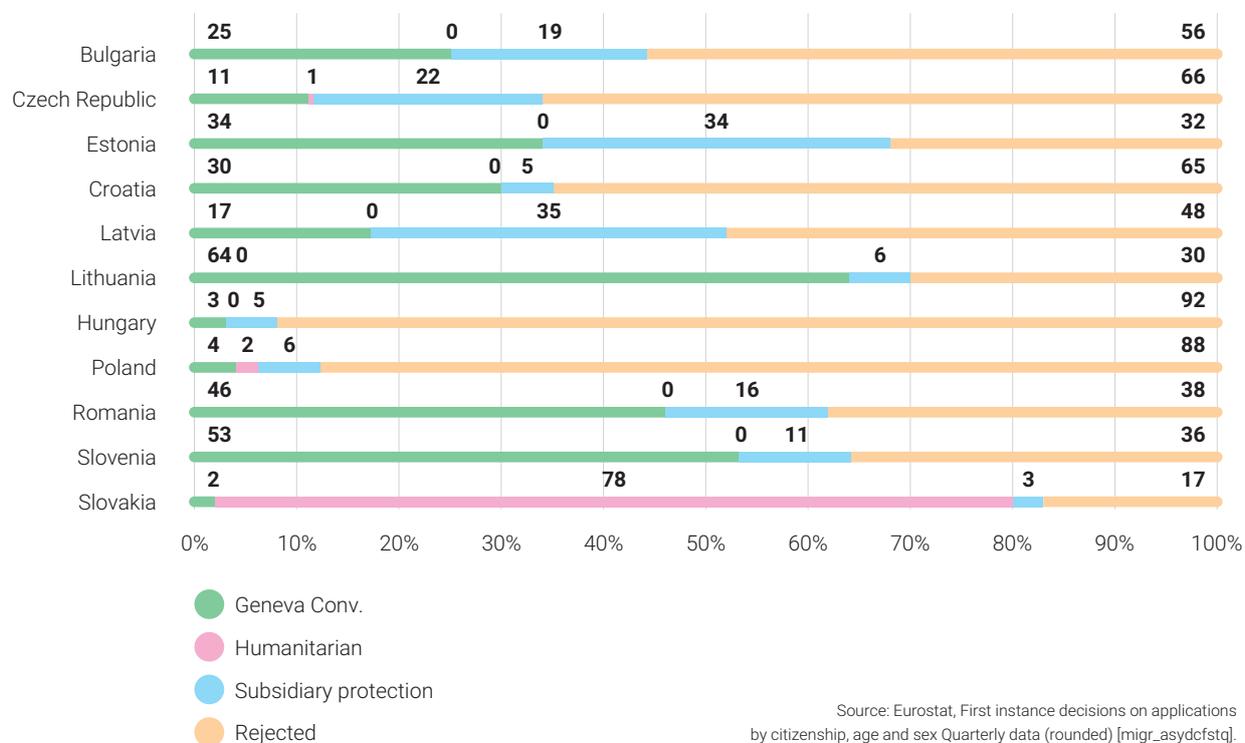
From the point of view of a non-national, refugee status is the most advantageous form of international protection, among others it entitles to social welfare in the receiving country. The countries where most refugee status applications were approved were Luxembourg and Austria (Chart 1.4). Nearly 60 per cent of non-nationals applying were granted with status in those countries. Averaging the results for EU-28, every third non-national was granted refugee status. There were much more negative decisions. The average for EU-28 was 39 per cent; most applications were rejected in Ireland and Greece. That means those countries should be least attractive for asylum seekers. Spain and Sweden were the countries where most persons were granted subsidiary protection.

Chart 1.4  
First instance decision on applications in EU-15 in 2016



Much greater differentiation with regard to conferring various forms of international protection can be observed in the CEE countries. Those countries stand out among all EU countries as they express their resistance against the asylum policy of the EU and emphasize their unwillingness to accept refugees (Chart 1.5). It is particularly apparent in the countries of the Visegrad Group, where rejected applications amounted to 17 per cent in Slovakia, 66 per cent in the Czech Republic, 88 per cent in Poland and 92 per cent in Hungary. Such restrictiveness is explained by the policy makers of those four countries ensuring the safety of their residents. These differences result primarily from the nationality structure of persons applying for international protection. It is citizens of Russia (Chechens) and Ukraine who mainly submit applications in those countries but they receive other forms of protection.

Chart 1.5  
First instance decisions on applications in CEE countries in 2016



# Conclusions

- In an analysis it is necessary to consider migration stocks and migration flows of various types of migrations both the long-term migrations and those lasting less than 12 months.
- EU citizens are distinguished by less worker mobility than citizens of the USA, Canada and Australia. At the same time, we can see the breakdown in which the CEE countries are still not attractive for the residents of Western Europe.
- The patterns of migrations of the CEE countries are different from those of the other EU Member States.
- The Czech Republic and Poland are the examples of countries which build their attractiveness on the international scene attracting more and more laborer immigrants.
- The immigrants in the CEE countries come, first of all, from the post-Soviet states in the immediate vicinity of the destination countries – among others from Ukraine and Russia – but also from Balkan countries.
- In the CEE countries great interest in emigration continues and growing number of immigrants does not compensate for the losses caused by emigration of working-age population.
- EU-15 countries are much more differentiated in their national structure than the CEE countries. On average non-nationals amount to about 10 per cent of the population in EU-28 countries while only 4 per cent in CEE countries.
- For some years, there has been increased interest in the immigration to EU countries as well as migration within the EU, but the influx of third-country nationals dominates.
- The influx of refugees to EU-28 Member States in 2016 and the first quarter of 2017 was decreasing, but it can be expected that in the second half of 2017 the refugee migration will grow.
- Refugee migrations, including the illegal ones without objective legal grounds had a very negative impact on the perception of refugees by a fairly large number of EU nationals, which leads to a serious crisis in coherent understanding of the values and value hierarchies on which the EU is based (which is more important? safety and cultural coherence, or the help given to people culturally different with the threat of gradual but consequent displacement of European values by the elements of an alien culture, which is foreign and incompatible with the EU).

## Chapter II

Migrations in the 21<sup>st</sup> century

– possible forms of labour mobility

## Introduction

The 20<sup>th</sup> century is deservedly referred to as the century of migrations. Population movement has become one of the most important processes influencing the functioning of societies all over the world. It is projected that with the passing of coming years intensification of popular mobility will be observed together with an increase in the variety of its forms. This will be especially noticed with highly qualified workers for whom the change of job location will be a natural phase in their professional career. The definition of migration used in Eurostat or OECD statistics is limited to change of place of residence over a particular period of time (usually over 12 months). This approach leaves out in the analysis of population flows those forms of mobility whose duration is of indeterminate /liquid character.

The dynamic development of new technologies as well as common access to means of transport (cheap flights in the first place) play a significant role in the growth of mobility on a global scale. More and more often the distance between two locations is expressed in terms of journey time, rather than in kilometres. This extremely interesting phenomenon of mobility in the modern global world is described in the following words by the world famous sociologist Zygmunt Bauman:

*Mobility turns out to be the most appreciated and desired value, and the freedom of movement – the unevenly distributed commodity, always scant – soon becomes the main factor shaping social divisions in the late modern era or in times of postmodernity*

– Globalization: The Human Consequences, Columbia University Press 1998.

In this chapter various examples of labour mobility will be presented: especially those, whose intensification can be observed in subsequent decades of the 21<sup>st</sup> century. They relate to mobility more or less legally regulated on the EU level. Part of these movements is directly related to new technologies and to the functioning of knowledge-based economies. Another part is created in response to demographic challenges faced by Europe. The purpose of the chapter is to characterize those forms of the labour mobility which have recently become a topic of discussion at the EU level. It is only pointing out the “migration mosaic”, observed more and more clearly in highly developed economies. Particular attention has been paid to the “twin track” approach to shaping EU migration policy – treating citizens of EU Member States one way and treating third countries nationals another way. The results of scholarly and commercial research have been used in the study as well as legal regulations at the EU level, and statistical data.

## Mobility of the labour force from third countries

From the data of Eurobarometer it follows that since 2013 the significance of immigration as one of two most important challenges the EU was facing has been growing. Since 2015 that subject dethroned the economic situation inside the EU; it has become the number one challenge in the consciousness of Europeans<sup>6</sup>.

<sup>6</sup> Eurobarometer, <http://ec.europa.eu/commfrontoffice/publicopinion/index.cfm/Chart/getChart/themeKy/31/groupKy/188>

It is worth emphasizing that the residents of the EU Member States are more open to the migration of other EU citizens than to immigration of third country nationals. This is the result of the influence of immigration crisis connected with uncontrolled influx of foreigners.

Labour migrations in the second half of the 20<sup>th</sup> century enabled rapid economic development in the countries of Western Europe. As the outstanding expert on demographic migrations at the University of Amsterdam, Prof. Rinnus Penninx notes, nowadays the EU countries do not admit that they need immigrants because of their demographic problems. At the same time, he points out the paradox: the more the EU promotes movement and opens internal borders, the more it closes them for those who remain outside<sup>7</sup>.

The president of the European Commission Jean Claude Juncker stated in 2014 that EU must face competition from the USA, Canada and Australia for the best workers from the world. The key EU policy makers become more and more aware what an important role immigrants play in a modern economy. The distinction between actions oriented towards people using freedom of movement and towards nationals of the third countries becomes more and more clear.

Labour migrations from the third countries have been regulated in the EU no earlier than in the beginning of the 21<sup>st</sup> century. The previous solutions in migration policy, involved regulations preventing illegal immigration, and defined legal bases for asylum and visa policy. The adverse demographic processes taking place in most EU Member States has resulted in growing demand both for highly qualified and unskilled workers. This view has been expressed in Communication from the Commission – Policy Plan on Legal Migration: *With regard to economic immigration, the current situation and prospects of EU labour markets can be broadly described as a “need” scenario. Some Member States already experience substantial labour and skills shortages in certain sectors of the economy, which cannot be filled within the national labour markets. This phenomenon concerns the full range of qualifications - from unskilled workers to top academic professionals.*

Labour migration policy regarding third countries is driven by the need for particular groups of workers and by highly formalized procedures of access to the labour market. In recent decades some significant examples of regulations have been implemented which make the access of particular categories of workers from third countries to the labour markets easier<sup>8</sup>. The most important examples include regulations connected with:

**Promoting the EU as a place for studies and for work while studying** – Council Directive 2004/114/EC of 13 December 2004 on the conditions of admission of third-country nationals for the purposes of studies, pupil exchange, unremunerated training or voluntary service;

**Creating favourable conditions for researchers** – Council Directive 2005/71/EC of 12 October 2005 on a specific procedure for admitting third-country nationals for the purposes of scientific research;

**Legislative simplification and harmonization of standards relating to residence and access to the labour market** – Directive 2011/98/EU of the European Parliament and of the Council of 13 December 2011 on a single application procedure for a single permit for third-country nationals to reside and work in the territory of a Member State and on a common set of rights for third-country workers legally residing in a Member State;

<sup>7</sup> R. Penninx, *Paradoks migracyjny Unii Europejskiej: więcej mobilności, mniej imigrantów?*

w: A. Górny, P. Kaczmarczyk, M. Lesińska, *Transformacje. Przewodnik po zmianach społeczno-ekonomicznych w Polsce*, Warszawa 2016.

<sup>8</sup> OECD, *Recruiting Immigrant Workers: Europe 2016*, Paris 2016.

**Harmonization of procedures and establishing basic rights for seasonal workers** – Directive 2014/36/EU of the European Parliament and of the Council of 26 February 2014 on the conditions of entry and stay of third-country nationals for the purpose of employment as seasonal workers;

**Promoting the mobility of specialists within companies** – Directive 2014/66/EU of the European Parliament and of the Council of 15 May 2014 on the conditions of entry and residence of third-country nationals in the framework of an intra-corporate transfer.

Although restrictive regulations concerning access to labour markets for third countries nationals still exist, various kinds of mobility are promoted by EU institutions. The above examples of migration promotion show which forms of workers' mobility have priority.

### Migrations of specialists from third countries – the EU Blue Card

Steady technological progress and professionalization of work will lead to a growing demand for highly qualified workers with documented professional experience. One of the solutions to that problem, often discussed, is the EU Blue Card. The regulations connected with the acquisition of the Blue Card were defined in the Council Directive 2009/50/EC of 25 May 2009 regarding the conditions of entry and residence of third-country nationals for purposes of highly skilled employment.

The Blue Card is one of the forms of access to labour markets in EU countries for non-EU citizens. It is intended for persons with higher education or with certified higher professional skills and experience. This is an example of opening the EU Member State to specialists from all over the world. At the same time numerous restrictions are applied

in access to that form of migration. First of all payment is required for issuing the document. The payment varies. The highest payment in 2015 was in the Netherlands (EUR 881), the lowest is in Hungary (EUR 60). The period of validity depends on the country – most often it is either 12 or 24 months<sup>9</sup>. The Blue Card is intended for persons having permanent jobs and who earn at least 150 per cent of average gross monthly earnings in a particular Member State.

**Table 2.1**  
EU Blue Cards in CEE countries  
in 2014-2016

Country	2014	2015	2016
Bulgaria	21	61	115
Czech Republic	104	181	-
Estonia	15	19	22
Croatia	9	32	32
Latvia	32	87	112
Lithuania	92	128	-
Hungary	5	15	5
Poland	46	369	-
Romania	190	140	92
Slovenia	8	15	19
Slovakia	6	7	4

Source: Eurostat, EU Blue Cards by type of decision, occupation and citizenship (migr\_resbc1).

The Blue Card is issued in 25 states, but it is not employed in Denmark, Ireland and the United Kingdom. From the Eurostat data it follows that employers in the Member States are not overly interested in that form of access to labour markets. In 2012, the Blue Card was issued to 3,664 citizens of non-EU countries. In 2016, there were already as many as 18,598, 95 per cent of which were granted in Germany. In CEE countries in 2016 401 non-nationals were granted the Blue Card. The leaders in the region in this respect are Poland, Bulgaria and the Czech Republic (Table 2.1). In most of the CEE countries they do not exceed 100 cards per year. Most countries have not implemented the Blue Card in a serious way. Germany is an exception to this. From the analysis carried out by the OECD it follows this form of access to labour markets in 2013 may be issued to 94,000 citizens of non-EU countries<sup>10</sup>.

<sup>9</sup> European Commission, <http://ec.europa.eu/immigration/bluecard.en>

<sup>10</sup> OECD, *Recruiting Immigrant Workers: Europe 2016*, Paris 2016.

## Free movement of workers in the 21<sup>st</sup> century

The right to mobility of labour is one of the most important rights granted to Europeans. 500 million people can take advantage of that right; they can start education or work in another Member State. Unlike the case of the third country citizens, the mobility of the EU citizens (together with EEA and Switzerland) is less regulated and not subject to so many restrictions. Social and economic developments, as well as intensification of globalization, have led to changing forms of population movement within the EU. Technological progress and common access to cheap transportation enable decisions about labour migration. The persons taking advantage of these possibilities are increasingly difficult to capture in the statistics. Mobility is becoming a style of life, a philosophy of persons who have travelled since their early years, who are cosmopolitans and who make use of new technologies every day.

## Digital nomadism

The term which best reflects the impact of technological change on labour mobility is digital nomadism. It is a way for life and work where access to new technologies, willingness to get to know new locations and flexibility of employment lead to a high level of mobility. The right of free movement together with access to new technologies makes the “nomadic” way of life and work possible for millions of Europeans. Activities aiming at building knowledge-based economies with domination of advanced services will lead to further growth of that kind of mobility.

The information on contemporary nomadism from the first large survey conducted by the Infuture Hatalaska Foresight Institute is extremely interesting. In “Wanderers: A Report on Contemporary Nomads” they presented results of both quantitative and qualitative research carried out among contemporary mobile workers and making use of new technologies. From the beginning it was emphasized that in the perspective of 2035 the number of digital nomads may reach up to billion people. That will be primarily the result of demographic changes. New generations will also enter labour markets, those who grew up in the era of general access to the Internet and to new technologies<sup>11</sup>.

Digital nomadism is a style of life and work. Distance work can be done anywhere in the world owing to the access via digital technologies and means of communication. The element that is most characteristic for digital nomads is movement from one place to another and attachment to such values as freedom, independence, mobility and flexibility. According to the research a digital nomad is a self-employed freelancer. Work performed in one place only under the supervision of an employer is no longer a prevalent form of employment. Modern immigrants are knowledgeable about available means of transport, and about their destinations; they are also aware of the rights they are entitled to.

It is extremely difficult to estimate the number of people who could be defined as digital nomads. There are no formal indicators allowing the classification of this type of mobility with any definitions of migration. The trend is gaining in popularity, blogs about digital nomads are created on the Internet and guides with practical tips on how to become a digital nomad. The activity of digital nomads on the Internet is very vivid; rankings are constructed of cities and countries most attractive for them. What is interesting is that among the countries estimated as most attractive there are countries which are not listed as those which attract the most immigrants. In the ranking of 245 European cities several factors were taken into consideration; some are: access to broadband Internet, but also climate and landscape as well as costs of living. The first in the ranking was Budapest. Cities in Poland and Romania were also highly rated by digital nomads (Table 2.2). Cities from CEE countries got higher ratings than the capital cities or great urban agglomerations in the countries of western Europe.

<sup>11</sup> Hatalaska.com, *Wędrowcy: raport o współczesnych nomadach*, 2016.

Table 2.2

The most attractive cities in CEE countries according to digital nomads in June 2017

Country	Cities
<b>Bulgaria</b>	Plovdiv (9), Sofia (28), Varna (75), Burgas (87)
<b>Czech Republic</b>	Prague (62), Brno (214)
<b>Estonia</b>	Tallinn (31), Tartu (52)
<b>Croatia</b>	Zagreb (38), Zadar (68), Rijeka (110), Osijek (159), Split (170), Dubrovnik (186)
<b>Latvia</b>	Riga (83)
<b>Lithuania</b>	Kaunas (49), Vilnius (67)
<b>Hungary</b>	Budapest (1)
<b>Poland</b>	Warszawa (11), Gdańsk (23), Kraków (41), Szczecin (70), Łódź (100), Katowice (147), Poznań (151), Wrocław (153), Lublin (184)
<b>Romania</b>	Cluj (13), Timisoara (20), Bucharest (25), Ploiesti (26), Brasov (58), Craiova (173), Constanta (193), Iasi (230)
<b>Slovenia</b>	Ljubljana (30)
<b>Slovakia</b>	Bratislava (64), Kosice (145)

\* The numbers in parentheses indicate the location of the city in the ranking  
Source: Nomad List, <https://nomadlist.com/>

## Expatriates

Globalization of economic activity and the spread of multinational groups contribute to changes on the migration maps. Investments by international companies lead to creating new groups of mobile workers. As early as the second half of the 20<sup>th</sup> century, the branches of international companies were opened managed by well-trained managers. The person sent by his parent company to a subsidiary abroad and who works there on particular project, providing his knowledge and skills to local workers and managers, is referred to as an expatriate. This category represents, first of all, highly skilled specialists. Expatriation can be considered as the transfer of an employee to another country. In English language literature other terms are also used: boundary spanners, international business travelers, sojourners, globetrotters or multicultural managers<sup>12</sup>.

Who is an expatriate? According to international research by the Expat Insider and the Inter National Survey, he/she is a person over 40 (average age is 43 years) with undergraduate university and/or postgraduate education who works on average 41.4 hours a week. Every third person researched is planning to stay abroad permanently, every fifth person plans to remain abroad for 1-3 years. The largest number of expats comes from the USA, the United Kingdom, India, Germany and France. Most mobile senior managers reside in Germany, the USA, the United Arab Emirates, Switzerland and Spain. Several CEE countries were among the 57 most popular destinations for expats in 2016. The Czech Republic leads, (10<sup>th</sup> place in ranking), followed by Romania (16<sup>th</sup>), Hungary (21<sup>st</sup>), and Poland (24<sup>th</sup>). Those countries are in the group with the fastest growth rate every year<sup>13</sup>.

<sup>12</sup> S. Przytuła, *Zarządzanie kadrą expatriantów w filiach przedsiębiorstw międzynarodowych w Polsce*, Warszawa 2014, s.29.

<sup>13</sup> Inter Nations, <https://www.internations.org/expat-insider/>

The same positive expat attitude towards the CEE region was confirmed by the results of the HSBC Expat Explore Survey 2017<sup>14</sup>. Again, the Czech Republic plays a leading role (fourth place out of 45 countries). What is highly valued are the conditions and the costs of the living for a family in that country. The second country out of 45 countries all over the world is Poland – ranked 25<sup>th</sup>. As in the case of the Czech Republic, it was the conditions of family life that were highly valued by the respondents. The lowest assessments for both countries were for wage growth. The high ranking of these two countries is evidence of growing interest in the CEE region.

Companies active in international markets continue to create subsidiaries in other countries where they transfer part of production or departments responsible for management. Employment of expats in the new unit is often necessary due to their know-how. They also supervise the realization of local strategies and control investment plans set by the home office<sup>15</sup>. Some knowledge about the demand for expatriates can be found in the information on Foreign Direct Investments (FDI). The data on workplaces generated by the FDI are especially relevant. In 2015 and 2016, the leader among the EU Member States was the United Kingdom; the largest number of workplaces was developed there according to the FDI (Table 2.3). More than one thousand new ventures were realized each year in this country. The leader of the CEE countries is Poland with 22,000 new workplaces in 2016. Romania, the Czech Republic, Hungary and Slovakia also have high position in the rankings. The authors of the EY European Investment Monitor 2017 report emphasize growing interest of the FDI in CEE countries. Among other things world investors are keen to locate automobile factories there, e.g. in Slovakia or Hungary. This is due to easy access to qualified production workers<sup>16</sup>. Interest in investment in the CEE countries is growing every year and will lead to greater numbers of specialists residing in that region.

Table 2.3  
Top EU destination countries by FDI job creation and projects in 2015 and 2016

Country	2015		2016	
	Job creation	Projects	Job creation	Projects
United Kingdom	42,336	1,065	43,165	1,144
Poland	19,651	211	22,074	256
Germany	17,126	946	19,961	1,063
Romania	12,746	98	17,545	132
France	13,639	598	16,980	779
Czech Republic	9,332	70	14,292	110
Spain	7,126	248	12,969	308
Hungary	11,741	94	12,450	107
Ireland	10,772	124	8,535	141
Slovakia	9,564	54	8,309	70
Austria	1,357	-	4,759	-
Bulgaria	3,598	-	3,959	-
Belgium	3,168	211	3,309	200
Italy	1,383	55	2,654	89

Source: EY European Investment Monitor 2017, <http://www.ey.com/gl/en/issues/business-environment/ey-attractiveness-survey-europe-may-2017>

<sup>14</sup> HSBC, <https://www.expatorexplorer.hsbc.com/survey/>

<sup>15</sup> S. Przytuła, op. cit, s. 15.

<sup>16</sup> EY European Investment Monitor 2017, <http://www.ey.com/gl/en/issues/business-environment/ey-attractiveness-survey-europe-may-2017>

## Posting of workers

Recently, most discussions on taking advantage of the right of free movement are stimulated by the posting of workers to another EU Member State. It has become one of the most important social problems discussed on many levels: political, legal and economic. It is worth to emphasize that it concerns no more than one per cent of all workers in the EU. However, the projected change to Directive 96/71/WE, which defines the principles of posted of workers as part of provision of services, and was submitted in 2016 aroused great controversy as to the rights which these workers are entitled to<sup>17</sup>. Discourse about these changes is an example of different attitudes taken by EU Member States in view of the growing mobility of workers within the EU. In the countries which make use of posted workers on the greatest scale (Belgium, France or the Netherlands) voices can be heard against accepting any further ones.

**France belongs to the countries that advocate tightening the rules of posting of workers. The French government wants to limit the maximum period of posting of workers to 12 months. This is supposedly to fight so-called social dumping. President Macron's trip to selected CEE countries in the second half of August 2017 demonstrates the importance of the issues and unveils different views of individual states that are receiving workers from those states which are posting workers. Posting of workers may become a new political issue in foreign affairs.**

Source: Reuters, Macron confident of 'posted' workers deal after meeting Romanian president, <https://www.reuters.com/article/us-france-centraleurope-idUSKCN1B41KQ>

This kind of posting means a temporary shift of workers in a company to another Member State in order to fulfill the agreement with a foreign counterparty. The idea of posting of workers is related to the freedom of services in the EU internal market. The European Commission notes that this posting of workers is something different from the flows of labour, as it is temporary and not integrated with labour market. The posting of workers should be connected with performing a particular service or task, hence its temporary character is clearly emphasized. As a rule, the maximum period of accomplishing such work amounts to 24 months. With regard to staff regulations, the posted worker is subject to the regulations of the accepting country.

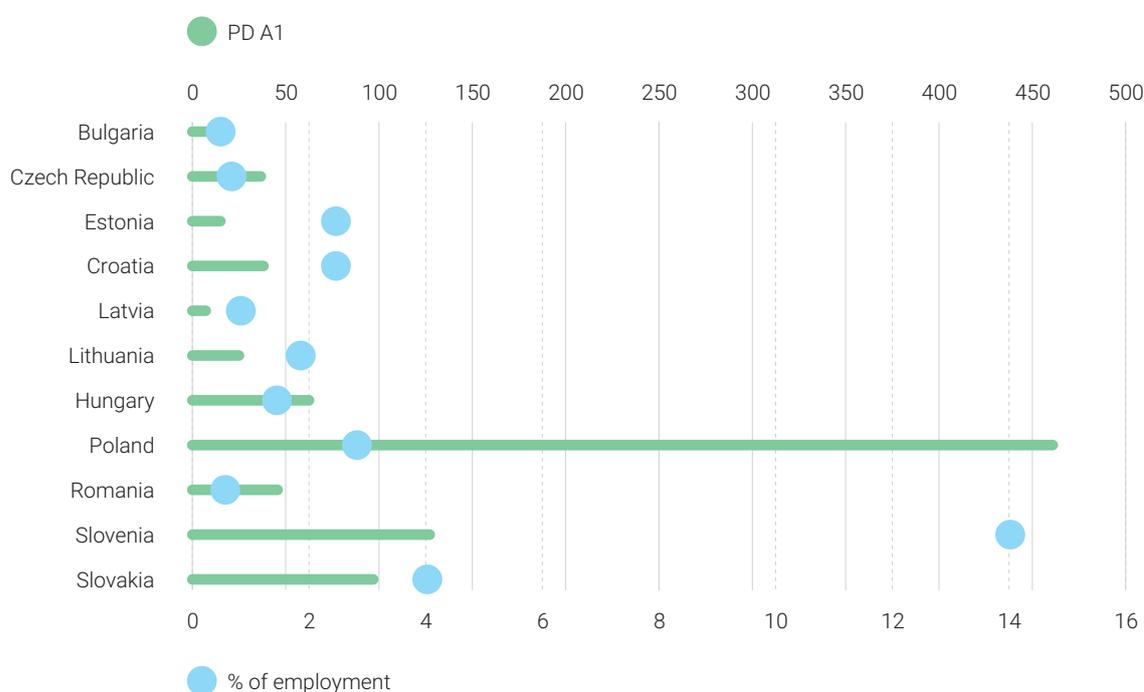
Most information on the number, direction and type of such activity comes from so-called "Portable Documents A1" (PD A1). These are the element of the system for coordination of social security and contain the necessary data. The experts note that one employee can have several A1 forms in a year.<sup>18</sup> From the most recent available data it follows that in 2015 in the EU 2.05 million PD A1 forms were given out. This is 0.6 per cent of all workers in 2015. Since 2010 a systematic growth of interest in posting of staff to another Member State has been observed.

<sup>17</sup> European Commission, <http://ec.europa.eu/social/mainisp?langid=en&catId=89&newsId=2488>

<sup>18</sup> Instytut Obywatelski, <http://www.instytutobywatelski.pl/25303/komentarze/nauka-i-praca/analiza-europejski-spor-o-delegowanie-pracownikow>

Poland belongs to the countries from which there is the greatest number of posted workers. In 2015, over 430,000 PD A1 forms were issued. One in five transferred workers came from Poland. The second in rank is Germany (241,000 PD A1) and France (139,000 PD A1). Among the CEE countries another leader is Estonia, where 127,000 PD A1 were issued. At the same time, as a result of posting of workers that country “lost” more than 14 per cent of its working population in the age bracket 15-64 years (Chart 2.1). In the other countries of the region not more than 4 per cent of the working population were “lost” temporarily. In Slovakia nearly 100,000 PD A1 were issued. In other CEE countries the number did not exceed 50,000.

**Chart 2.1**  
Portable documents A1 issued (in thousands) in 2015 and posted workers as a percentage of total employment in CEE countries (in %)



Source: European Commission, *Posting of workers – Report on A1 portable documents issued in 2015*, Brussels 2016.

Most posted workers are in Germany (28%), France (12%) and Belgium (10%). Among the CEE countries the Czech Republic (1.3%) leads followed by Poland (1.2%). In most of countries of the region the number of PD A1 did not exceed 10,000 in 2015. Posted workers are sent primarily to EU-15 countries (86% of all posted workers); only 14 per cent go to CEE countries. Interestingly, the majority of workers transferred to CEE countries came from Germany, France and Poland. For some years the industrial sector has dominated (66%) in which most workers are employed in building (41.6%). Every third worker was posted to the services sector<sup>19</sup>.

<sup>19</sup> European Commission, *Posting of workers – Report on A1 portable documents issued in 2015*, Brussels 2016.

# Conclusions

- Immigration is one of the most important topics in the EU. This has been confirmed both by the results of public opinion research and the intensification of legislative activities in recent years.
- In the 21<sup>st</sup> century growing interest in the mobility of both low and highly skilled workers will be noticeable.
- As new forms of mobility will appear, they will require new legal regulations. They will also be a challenge for public finances and social security systems.
- Mobile workers will create ever greater challenges, especially for HR departments.
- At the EU level a clear distinction can be noticed between migration of the citizens of the Member States taking advantage of the freedom of movement and the citizens of the third countries.
- Access to new technologies and means of transport brings about an intensification of labour mobility and newly emerging forms of it.
- In the future, worker mobility may dominate the topic of migration. It seems that more research on this subject is necessary.
- Further development of the FDI may lead to mobility of high-skill specialists who will bring both know-how and organizational culture from other countries.
- In the face of demographic challenges, EU Member States must open both to low-skilled workers and to those with special qualifications in demand on European labour markets.
- International research points to Poland and the Czech Republic as highly attractive destinations for workers with high qualifications. Those two countries are the leaders in the CEE region.
- In 2016 and 2017, the issue of posting of workers dominated discussions on the functioning of Single Market in the EU.

## Chapter III

Automation and robotization of work  
– new challenges for CEE countries?

## Introduction

New technologies are supporting workers when they carry out simple as well as more complex tasks. It is difficult to imagine today employees of multinational corporations who do not use their mobile phones, laptops or applications to communicate. The work of blue collars performing simple tasks in the factory is assisted by machines and robots which facilitate and speed up the production process. As early as the 1970s, the process of automating work and production took place; intensification of this portended the next technological revolution. Year by year, one can observe increasing progress and more influence of technological processes on the world of labour. On one hand, we can talk about changes in the way a job is provided, and on the other, new needs and tasks appear, requiring specific knowledge and new skills that open the door to creating new professions.

The dynamic of change which can be observed in the world of labour causes experts, policy-makers, entrepreneurs and workers themselves to ask questions in terms of what future work will look like. Particularly repeated is the question whether commonly occurring robots, machines, computers and information systems applications will take away jobs from humans<sup>20</sup>. The labour market processes taking place in the USA, as described by economists, futurologists and engineers, show that these changes will most certainly occur in other economies, and the main dispute is when it will happen and to what extent. The processes of globalization affect to varying degrees the organization of production and employment relations. Increasingly, CEE countries are also more frequently involved. As **Jeremy Rifkin** noted in 2005:

*In Western Europe, thousands of jobs have been eliminated as companies move their production facilities abroad. In many cases, the jobs are only temporarily being relocated to the Czech Republic or Poland. But these debates conveniently avoid the real problem: jobs aren't just being outsourced to lower-wage nations -- they're being replaced by automation<sup>20</sup>.*

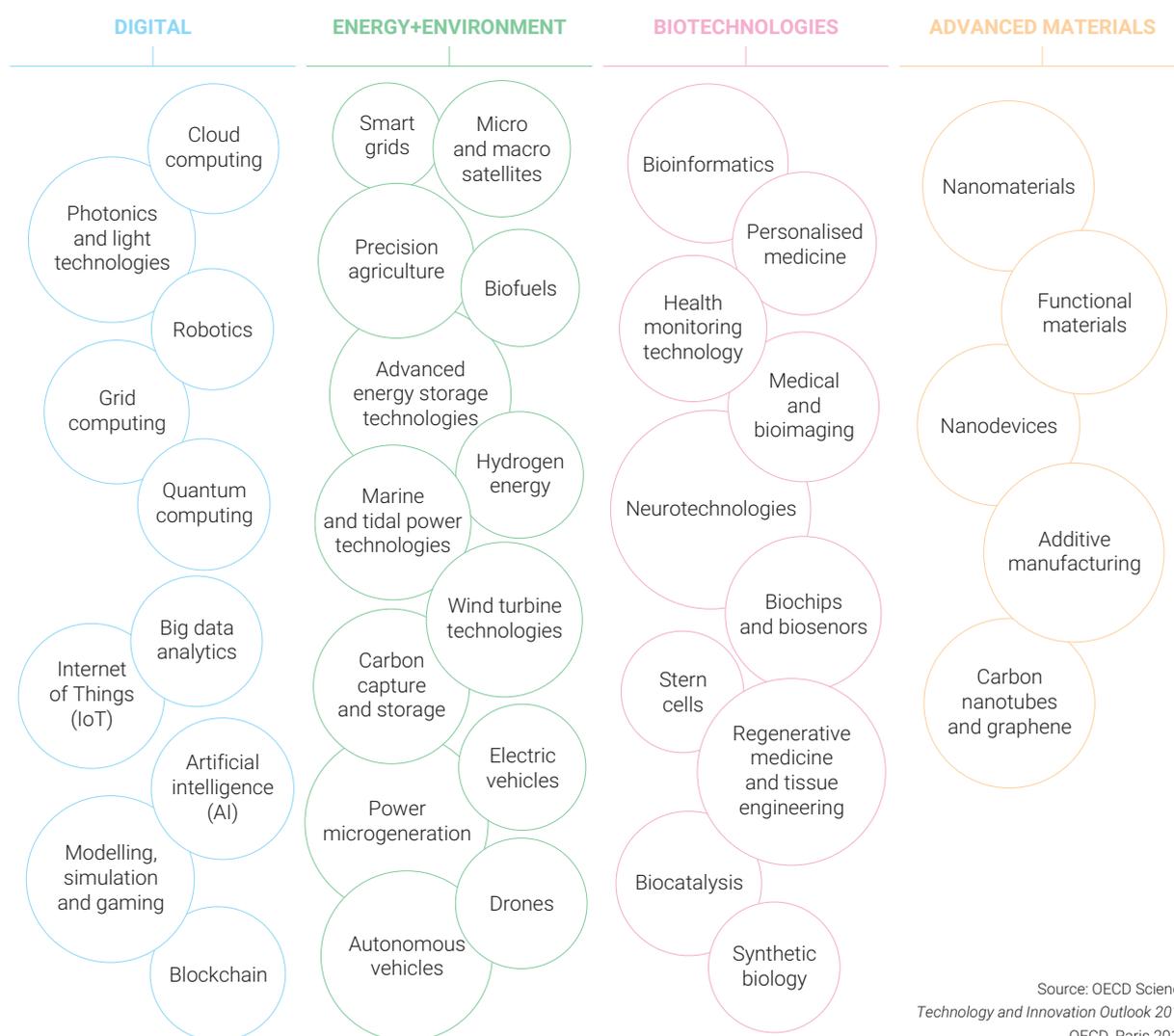
The main purpose of this chapter is to characterize the most important changes in the labour market caused by the ongoing processes of automation, robotization and computerization. Particular attention has been paid to the specifics of changes in the world of work in Central and Eastern Europe. Reading this chapter will help towards better understanding of the essence of the processes that will shape the socio-economic reality in the decades of the 21<sup>st</sup> century. The chapter presents the results of the most important research of the last few years in order to present the most important arguments in the discussion about the end of human work and its overtaking by robots and machines.

<sup>20</sup> Spiegel Online, <http://www.spiegel.de/international/jeremy-rifkin-on-europe-s-uncertain-future-the-end-of-work-a-368155.html>

### The future of labour. What awaits us in the fourth industrial revolution?

It is extremely difficult to determine exactly what the world will look like in upcoming decades. Representatives of the scientific world are trying to predict which processes, phenomena and technological solutions will prevail in the 21<sup>st</sup> century. The consistent list of such technologies has been included in the “OECD Science, Technology and Innovation Outlook 2016”. The report identifies “future technologies” in four categories: digital, energy and environment, biotechnologies and advanced materials. It presents the most important phenomena and trends that characterize the essence of the fourth technological revolution. These technologies will not remain irrelevant to the functioning of the world of work in the near future. Further development and implementation of these solutions will result in increased demand for highly qualified and skilled professionals with unique knowledge and skills. In addition to the manufacturing sector digital transformation will also include energy production, agriculture, transport, defence industries, public security, administration or the area of urban space. The most discussed in the context of the labour market are robotics, big data analytics, Internet of things, and artificial intelligence. Particular attention in the remainder of this chapter will be paid to the impact of robotics on the workplace and employees.

Table 3.1  
40 keys and emerging technologies for the future



Source: OECD Science, Technology and Innovation Outlook 2016, OECD, Paris 2017.

**The fourth technological revolution (also referred to as digital industrial revolution) is a general concept encompassing changes in the sphere of production that make use of new technologies and their 21<sup>st</sup> century impact on the functioning of the economy. According to the Polish Ministry of Development, the fourth industrial revolution is changing both the business activity of particular companies and entire industries. The transformation process of the production base envisions that at every stage of the production chain, starting from the phase of designing, through manufacturing, servicing and recycling, the use of modern intelligent information technologies; and automation is indispensable. Industry understood in this way is characterized by a high degree of flexibility fulfilling individual needs of customers, and by optimization of production processes, but also by the possibility of rapid change in both production and logistic processes, and better use of resources. These are the attributes of companies that will determine their competitive advantage in the market.**

Source: Polish Ministry of Development,  
<https://www.mr.gov.pl/strony/zadania/reindustrializacja-gospodarki/czwarta-rewolucja-przemyslowa/>

The impact of information technology is becoming recognized throughout the whole economy. New technologies have entered the big factories, multinational corporations and smaller companies for good. Employees of all industries and sectors are using new technologies in their daily work. This applies to jobs delivering simple services, industrial workers, and to people employed in the financial services, health or ICT sectors. As shown by the results of the Sixth European Working Conditions Survey 2015, the degree to which mobile technology is being used by workers varies widely across the EU. Every other employee in Luxembourg almost always uses computers, laptops, smartphones, etc. Employees in EU-15 countries are more likely to apply new technologies than employees in CEE. The leaders of this second group are employees in Croatia and Estonia. The lowest degree of digitization of employees takes place in the Czech Republic. Large disparities between particular countries can be explained by differences in advanced services where continual access to new technologies is fundamental in providing work.

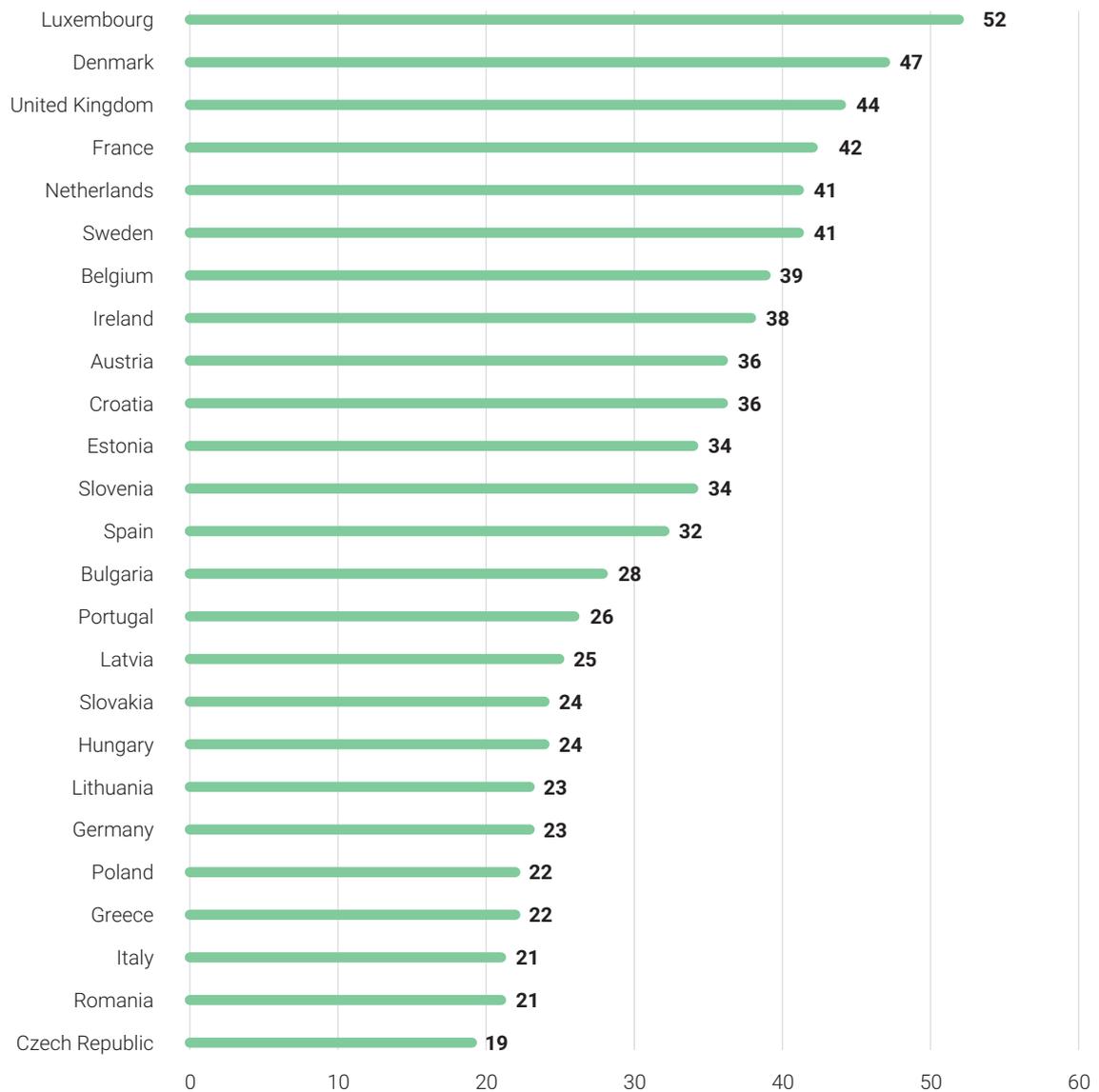
The model of work and employment is changing. Especially in highly developed countries with advanced technologies one may observe a transition from the Ford model to the post-Ford model. The situation, in which workers after leaving school are hired by the company where they will work until their retirement, belongs to the past<sup>21</sup>. Workers during their career can work for several employers at a time, and can easily change jobs and occupations. Work becomes more fragmented and non-standard. Dynamic changes in the socio-economic dimension require from employees flexibility, mobility and adaptability to new circumstances<sup>22</sup>. Increasingly, employees are required to demonstrate advanced digital competences proved by certification. Especially desirable in the labour market are employees distinguished by their creativity, openness to the world, interdisciplinary skills and ability to work under the pressure of time. Employers are also looking for employees who are keen on continuing training and develop their skills.

<sup>21</sup> J. Gardawski, J. Bartkowski, J. Męcina, J. Czarzasty, *Working Poles and the Crisis of Fordism*, Warsaw 2010.

<sup>22</sup> G. Standing, *The Precariat: The New Dangerous Class*, 2011.

Chart 3.1

Percentage of employees who in their work almost all the time use computers, laptops, smartphones etc. in EU Member States in 2015



Source: Eurofound, Sixth European Working Conditions Survey 2015.

**Estonia is the leader among all EU countries regarding the construction of an information society or a knowledge-based society. Already in 1996, the government initiated the action called "Tiger Leap" aimed at connecting all schools to the Internet. Since 2000, the access to Internet for all the citizens of the country has been entered into the Constitution of Estonia. Official and financial matters as well as voting in elections can all take place online.**

Source: BBC, How Estonia became E-stonia, <http://www.bbc.com/news/business-22317297>

Progressive changes in the workplace require particular attention from policy makers. European Commission also foresees far-reaching changes regarding profiles of workplaces (among others an increase in significance of non-routine tasks or an upgrade in the proportion of self-employed persons and freelancers) as well as organization of work (among others partial transition to the world of virtual work), and intensification of the use of video communications. Changes in the institutional environment of the labour market are particularly needed. Appropriate adjustments to labour law or to regulations concerning business activity pose a challenge for the government. Emerging new jobs require more flexibility in employment, work time, continuous mobility and being connected to Internet.

Highly developed countries are looking for solutions in the area of social policy (e.g. basic income among them) which would allow the growing mass of people without employment to function. Countries are not ready for changes related to the growing automation of work. Depriving people of their jobs may undermine the system of public finances as both the base of taxpayers and the base of those contributing to social insurance will diminish considerably.

**Rapid development of robotization and artificial intelligence was noted by the members of the European Parliament in February 2017. They called attention to the question of ethics and responsibility for damages made by robots or autonomous cars. The members of EU Parliament called on the European Commission to create a special status for robots, to introduce obligatory insurance for driverless cars and to establish a European agency for robotics and artificial intelligence.**

Source: European Parliament News, Robots and artificial intelligence: MEPs call for EU-wide liability rules, <http://www.europarl.europa.eu/news/en/press-room/20170210IPR61808/robots-and-artificial-intelligence-meps-call-for-eu-wide-liability-rules>

All of these impact business activity and that is why all these factors in accounting regulations or Labour Code provisions like work time need to be continuously adopted. There are also questions about ways to ensure security in the labour market for employees. All this requires appropriate legislative preparation. At the same time, one may anticipate greater trade union activity in those industries which may lose most as the results of automation and robotization processes arrive. Also, labour inspections will need to pay more attention to the aspects of machine-to-human collaboration and the potential risks of increased usage of new technologies at work. We will probably be witnessing the further development of higher education institutions and training institutions, responding quickly to the demands of the labour market.

## **Robotization of work**

Robots and machines are no longer a product of the imagination of moviemakers, cartoonists or futurologists. The rapid progress of R&D (Research and Development) and the demand for continuous improvement of existing solutions leads to the dynamic development of the robot's ability to perform increasingly advanced tasks. In the future robots will be easily catching up with humans in terms of the body movements or creative tasks. Even today, automats and robots are in many ways better employees than humans. First of all, they are more efficient, they can work in difficult and unsafe conditions, they can do work without rest and vacation. Unlike the humans, robots do not protest; they do not demand a salary increase.

In many industries and sectors, there are many advantages to employing people, but these proportions are constantly changing. The use of robots makes it possible to hand over routine, repetitive tasks to them.

The rapid advances in robotics lead to the emergence of new examples of using and the creation of new classifications of robots. For the purposes of this chapter, the division into industrial and service robots is of particular importance. According to International Robot Association' definition, industrial robot is "automatically controlled reprogrammable, multifunctional manipulator with at least three programmable axes which may be either fixed in place or mobile for use in industrial automation applications." Service robots are designed to support, accompany and nurse humans, sharing the human environment and exhibiting basic intelligent behaviour to accomplish assigned tasks. They fall into three classes:

**Class 1** robots replace humans at work in dirty, hazardous environments and tedious operations,

**Class 2** robots operate closely with humans to increase comfort, such as entertainment, assisting the elderly, carrying patients or working together with humans,

**Class 3** robots operate on humans, e.g. medical robots for diagnosis, surgery, treatment and rehabilitation<sup>23</sup>.

Robots can perform different functions and be used to different degrees in various sectors of production and services. Information about the sale of robots is provided by the International Federation of Robotics. These data apply to new robots, they do not include modifications introduced to robots already existing that have been in use in industry for several decades. In the year 2015, a record sales of robots was registered, which on a global scale reached 253,748 units. This constituted an increase of 15 per cent in comparison to 2014. The OECD estimates that in 2018 the global demand for robots will increase to 400,000<sup>24</sup>. Sales of robots are primarily accounted for by five countries which purchased 75 per cent of all the robots in 2015 - China, South Korea, Japan, the USA and Germany. The Czech Republic and Poland are indicated as countries where there is a growing interest in buying robots in Eastern Europe<sup>25</sup>. The greatest demand for industrial robots is observed in automotive, electrical / electronics and metal industries.

### **Can workers sleep peacefully? What do key experts and policy makers think about automation and robotization?**

The consequences of rapidly progressing robotization and automation processes are increasingly being commented on by researchers, analysts and policy makers. Particularly in the last years, one can observe the ongoing discourse that proves growing awareness of the most important actors of the fourth industrial revolution. Most of the studies and analyses that are commented on in EU countries concern vivid changes in the USA labour market. Replacing human work with automats and robots is more and more becoming a common socio-economic topic in the United States.

<sup>23</sup> European Agency for Safety and Health at Work, *A review on the future of work: roboticsm*, <https://osha.europa.eu/en/tools-and-publications/publications/future-work-robotics/view>

<sup>24</sup> *OECD Science, Technology and Innovation Outlook 2016*, OECD 2016.

<sup>25</sup> International Federation of Robotics, *Executive Summary World Robotics 2016 Industrial Robots*, 2017

In one of the recent reports prepared during the presidency of **Barack Obama**, special attention has been paid to the influence of artificial intelligence on the various dimensions of functioning of the state and the society. In the report "Preparing for the future of artificial intelligence", prepared by the Executive Office of the President's National Science and Technology Council, Committee on Technology, published in October 2016, we can read: *AI-driven automation will continue to create wealth and expand the American economy in the coming years, but, while many will benefit, that growth will not be costless and will be accompanied by changes in the skills that workers need to succeed in the economy, and structural changes in the economy. Aggressive policy action will be needed to help Americans who are disadvantaged by these changes and to ensure that the enormous benefits of AI and automation are developed by and available to all*<sup>26</sup>.

Challenges related to technological progress in the area of labour are also a challenge for EU Member States. Awareness among the most important political decision-makers in the EU increased not long ago. In the letter addressed to participants of the G20 meeting this topic was touched on by the two most important of the EU politicians – **Donald Tusk and Jean-Claude Juncker**: *With accessible, open, reliable and secure internet, digitisation can drive productivity and sustainable development. We will seek G20 cooperation to develop common standards for the fifth generation of mobile communication networks and interoperable digitised products and services; promote free flow of information while respecting applicable legal frameworks for privacy and personal data protection; uphold fair competition in the digital environment; and tackle cyber threats. We will also underline the need to prepare for the profound impact of digitalisation and automation on labour, by investing in digital skills and adapting social security systems to benefit workers in all work arrangements*<sup>27</sup>.

Making aware of the magnitude of change and their far-reaching consequences is one of the key tasks of international organizations. One of them is the International Labour Organization. The subject of the future of work, related to the 4.0 revolution, will be one of the topics accompanying the celebration of the 100<sup>th</sup> anniversary of the founding of the ILO in 1919. As noted by Director-General ILO, **Guy Ryder**: *Today, anxiety that new technologies could destroy millions of jobs is as high as ever. In the midst of a major employment crisis, technology continues to reduce the labour needed for mass production, while the automation of routine legal and accounting tasks is hollowing out that sector of the job market as well. The science of robotics is revolutionizing manufacturing (...). Adapting the labour market to a world of increasingly automated workplaces will be one of the defining challenges of our era*<sup>28</sup>.

More and more often, the icons of the ICT sector, whose projects revolutionize and "digitize" the contemporary world, speak out publicly about the impact of technological progress on the world of labour. At the same time, they are billionaires, employing thousands of people around the world and having a tremendous impact on the lives of tens of millions of people around the world. One such figure is **Elon Musk**, Silicon Valley futurist, creator and CEO of SolarCity, Tesla and SpaceX. He points out that governments should prepare for the situation when robots will take away work from humans: *Twenty years is a short period of time to have something like 12-15 percent of the workforce be unemployed (...). I think we need to be very careful in how we adopt artificial intelligence and that we make sure that researchers don't get carried away. Sometimes what will happen is a scientist will get so engrossed in their work that they don't really realize the ramifications of what they're doing. (...) What to do about mass unemployment? This is going to be a massive social challenge. There will be fewer and fewer jobs that a robot cannot do better [than a human]. These are not things that I wish will happen. These are simply things that I think probably will happen*<sup>29</sup>.

<sup>27</sup> European Council, <http://www.consilium.europa.eu/en/press/press-releases/2017/07/05-tusk-juncker-joint-letter-g20/>

<sup>28</sup> Social Europe, <https://www.socialeurope.eu/labor-in-the-age-of-robots>

<sup>29</sup> Newsweek, <http://www.newsweek.com/elon-musk-world-government-summit-556211>

**Mark Zuckerberg**, founder and CEO of Facebook, also spoke out about the negative impact of new technologies on employees: *Our generation will have to deal with tens of millions of jobs replaced by automation like self-driving cars and trucks. When our parents graduated, purpose reliably came from your job, your church, your community. But today, technology and automation are eliminating many jobs. Membership in communities is declining. Many people feel disconnected and depressed, and are trying to fill a void*<sup>30</sup>.

Changes in the sphere of work caused by technological processes can bring about ambiguous consequences for employment. This opinion is shared by **Preston McAfee**, chief economist at Microsoft Corporation and a researcher in new technology. His statement as follows: *Every technology replaces some kind of human work. The question, however, is how new technologies in the current fourth industrial revolution will affect employees' competencies: will they replace or complement them? (...). Although every technology replaces man and his work, at the same time it does not make us poorer. On the contrary, it may lead to a greater wealth. This is about skills and competences. Education, acquiring new knowledge, development of qualifications in the area of new technologies enhanced professional development and help winning leadership position*<sup>31</sup>.

According to **Stephen Hawking**: *The automation of factories has already decimated jobs in traditional manufacturing, and the rise of artificial intelligence is likely to extend this job destruction deep into the middle classes, with only the most caring, creative or supervisory roles remaining. This in turn will accelerate the already widening economic inequality around the world. The internet and the platforms that it makes possible allow very small groups of individuals to make enormous profits while employing very few people. This is inevitable, it is progress, but it is also socially destructive*<sup>32</sup>.

From the point of view of this report, it is most important to be aware of changes in the workplace, raised among the experts, who have an impact on decisions made in terms of international migration. So far, these two issues (migration and robotization) have not been distinctively put together. That is why the statement by the head of the International Organization for Migration, **William Lacy Swing**, sounds particularly important: *Migrants are agents of development. Migrants are not perfect. But neither are nationals. Migrants are more often than not young, dynamic. They are potentially tax-payers. In the long-run, they would expand the tax base, which more than compensates what is spent on providing them free basic services. This matters in countries with aging populations*<sup>33</sup>.

Among the key actors quoted in the fourth technology revolution, there are evidently many concerns about the dynamics and uncontrolled advances in robotics and AI development. In spite of the benefits that businesses have from modernization of their production or increasing sales, "experts" recognize numerous threats to the functioning of the society. There are millions of employees trapped in this special situation, workers who perform repetitive work, easily replaceable by new technologies. The ongoing debate between new technology creators, researchers, policy-makers and international authorities is valued and welcomed.

<sup>30</sup> LinkedIn, <https://www.linkedin.com/pulse/gates-zuckerberg-future-jobs-eq-edward-lewellen>

<sup>31</sup> Forbes, <https://www.forbes.pl/technologie/ekonomista-microsoft-technologie-moze-zastepowac-ludzkie-kompetencje-lub-je/63s0eyk>

<sup>32</sup> The Guardian, <https://www.theguardian.com/commentisfree/2016/dec/01/stephen-hawking-dangerous-time-planet-inequality>

<sup>33</sup> Citiscope, <http://citiscope.org/habitatIII/news/2016/10/migrants-are-agents-development-says-un-migration-chief-william-lacy-swing>

## Will robots take away work from humans?

The fear of losing work as a result of the rise of machines is not a new phenomenon. Particularly interesting instances are provided by history – events of the Industrial Revolution in Great Britain. At the beginning of the 19<sup>th</sup> century, a wave of protests across the country was triggered by workers in the textile industry. The so-called “luddites”, fearing replacement by machines, destroyed them. In the later years there were no similar activities of employees. More and more machines were introduced and continually refined; they accompanied factory employees in their work. Looking from the long-term perspective, further industrial revolutions and accelerated progress in technology have contributed to employment growth on a global scale<sup>34</sup>.

In the discussion about the consequences of technological progress for the world of labour, the most frequently asked question concerns taking away (often referred to as “stealing”) work from humans and replacing men with robots and computers. These questions are addressed in the titles of popular science books, in macroeconomic analyzes and in the press articles of major magazines and journals. The message to the global community sounds like the following: “in the future, a dramatic increase in the level of technological unemployment is expected”. Making dark scenarios and creating the vision of the world without work becomes an indispensable element in discussions about the further development of AI. The most interesting examples include such titles:

*Rise of the robots: technology and the threat on a jobless future*, Martin Ford. USA, 2015;  
*Robots will destroy our jobs – and we're not ready for it*, The Guardian, 2017;  
*Yes, the robots will steal our jobs. And that's fine*, The Washington Post, 2016  
*Robots will steal 24.7 million jobs and create 14.9 million new jobs by 2027*, TechRepublic, 2017;  
*How Technology Is Destroying Jobs*, MIT Technology Review, 2013;  
*The Long-Term Jobs Killer Is Not China. It's Automation*, The New York Times, 2016;  
*When Robots Take All the Work, What Will Be Left for Us to Do?*, Wired, 2014;  
*Automation and anxiety. Will smarter machines cause mass unemployment?*, The Economist, 2016.

**Driverless cars are the most controversial subject and give rise to disputes. They may pose a threat to the work of drivers. Unmanned cars have been tested for some years, first of all in the US. As early as 2010 Google used Google Maps, among others, and Google Street Views and ran successful test drives. In 2016 the governor of California gave his assent to unmanned cars and busses. In many places in the US such vehicles constitute a great tourist attraction.**

Source: Wired, California's finally ready for truly driverless cars,  
<https://www.wired.com/2017/03/californias-finally-ready-truly-driverless-cars/>

The characteristic feature of these changes is the disappearance of certain jobs and the emergence of completely new professions. There is bringing the demise of such traditional jobs as a shoemaker, tanner, bookbinder and blacksmith. They have been known to mankind for centuries. Some professions, still alive at the turn of the 20<sup>th</sup> and 21<sup>st</sup> century, are now fading into oblivion. One example is the work of a cashier, which is replaced by self-checkout.

<sup>34</sup> ILO, *World Employment Social Outlook. Trends 2017*, Geneva 2017.

Martin Ford in his book "The Rise of the Robots: The Future of Technology and the Threat of Jobless Future" points to radiologists whose work easily succumbs to application of technology - computers are better at analyzing digital images. F. Levy and R. Murnane, authors of the book "The New Division of Labour: How Computers are Creating the Next Job Market" noted that humans should concentrate on the tasks in which they have an advantage over machines, whilst computers, which are better at following rules, should perform tasks of arithmetic or related character.

**The residents of CEE countries are afraid to lose their jobs as a result of its automation and robotization. According to Eurobarometer research, in May 2017, an average of 60-80 per cent of the people interviewed agreed with the statement that robots and artificial intelligence will take work from people. Nearly every other interviewee in the CEE countries reckons that his present job could be replaced by robots or artificial intelligence. At the same time, the decided majority of the people asked, express a positive or very positive appraisal of the impact of new technological solutions on the economy and on society, as well as on the standard of living of the population.**

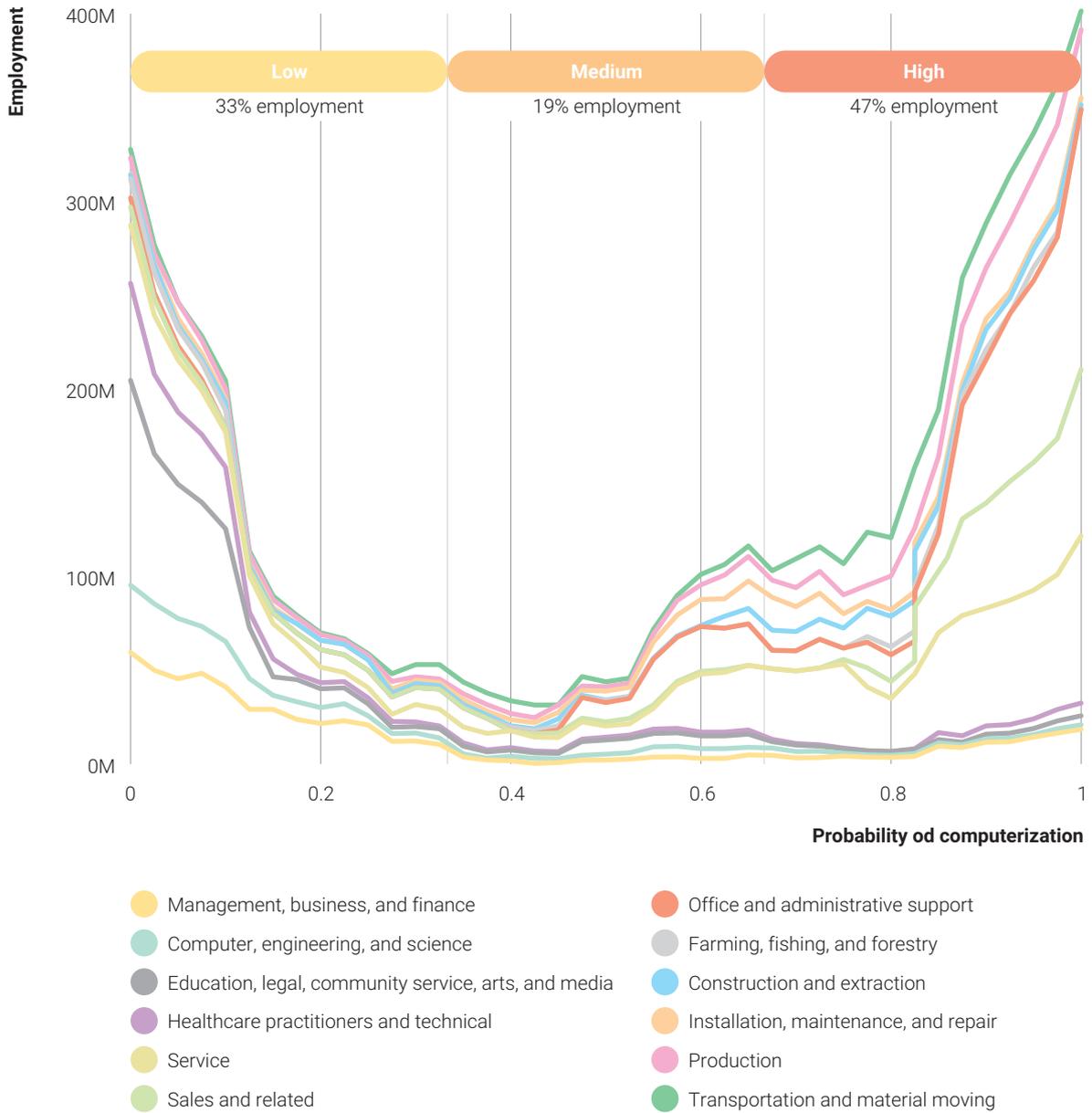
Source: Eurobarometer, Attitudes towards the impact of digitalization and automation on daily life, Special Eurobarometer 460, 2017.

The crucial factor in these changes is consumer behavior, which increasingly becomes the main driving force or constraint for the development of a specific industry or sector of the economy. Increasing interest in more advanced household appliances (such as autonomous iRobot vacuum cleaner) and garden equipment (e.g. autonomous lawnmowers) do not deprive the housewives or gardeners of work. Also in the next years 3D printers will not take over jobs of construction workers. These and many other technological solutions are treated in the form of curiosities, facilitation of work and speeding up certain tasks.

Over the past few years, experts around the world have been trying to accurately estimate how many employees may lose their jobs as a result of technological progress. These analyzes are based on various statistical and econometric methods. The results of these researches are often criticized for their assumptions and the high degree of accuracy at which the probability of replacing certain tasks or professions is determined. Most of these analyzes are specific to the US labour market and economy, where many researchers are trying to predict how much the world of work may change in the future.

The most commonly used data and at the same time most criticized, are the results of an analysis by C. Frey and M. A. Osborne from the University of Oxford. They presented a list of 702 occupations and estimated the risk of computerization for each of them. The analysis forecasts changes in the US labour market. One may argue the reliability of such accurate calculations and the methodology of the study itself. However, they show the direction of the most important changes in employment. The least threatened are jobs in the following groups of occupations: Healthcare Practitioners and Technical; Management, Business and Financial; Computer, Engineering and Science. These are types of professions requiring high qualifications, special preparation and where interpersonal relationships are of high significance. With high probability, computers may replace Office and Administrative Support, Service, Sales and Related. Among the twelve most threatened professions for which the probability of computerization is 99 per cent, are among others, library technicians, tax preparers, watch repairers and telemarketers (Chart 3.2).

Chart 3.2  
Probability of computerization by main groups of occupations

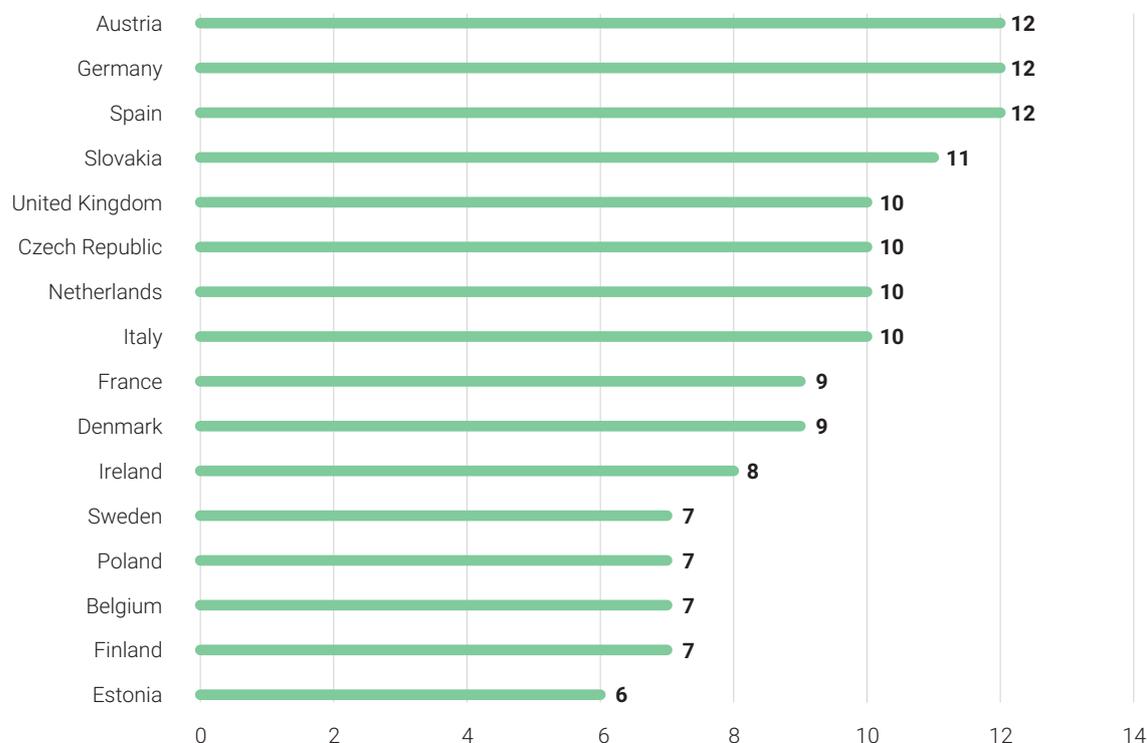


Source: C. B. Frey, M. A. Osborne, *The future of employment: how susceptible are jobs to computerisation?* 2013, [http://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf)

Another way for estimating the degree of work automation has been proposed by M. Arntz, T. Gregory and U. Zierahn. They have noticed that much more likely conclusions are derived from a task-based approach. It is the ability to substitute specific tasks performed by employees which allows us to determine the risk of taking away work from humans. In the report prepared for OECD, the authors have noted that the process of digitization and robotization will not destroy a large number of jobs. The analysis covers 21 OECD countries with, an average, 9 per cent of employees highly at risk of automation (Chart 3.3). In the EU the highest level is in Austria, Germany and Spain (12%), the smallest in Estonia (6%). This study also emphasized that the use of new technologies is a slow process due to economic, legal and social barriers.

Chart 3.3

Share of workers with high automatibility in selected EU countries



Source: M. Arntz, T. Gregory, U. Zierahn, *The risk of Automatisation for Jobs in OECD Countries: A Comparative Analysis*, OECD Social, Employment and Migration Working Papers, No. 189., OECD Publishing, Paris 2016.

One of the most important and interesting theoretical concepts explaining the nature of transformations in the workplace is the RBTC (routine-biased technical change) hypothesis, which concerns technological change directed at non-routine tasks. As noted by R. Keister and P. Lewandowski, this phenomenon leads to a systematic increase in the demand for highly skilled workers who perform analytical and interpersonal tasks which are difficult to automate. At the same time, further technological development leads to a decline in the demand for medium-skilled workers performing repetitive tasks based on a specific scenario tasks that can be represented by an algorithm<sup>35</sup>. A considerable group of immigrants, especially in CEE countries, was and still is recruited to these very jobs.

Technological progress puts their future employment under a question mark. Workers performing simple tasks may feel relatively safe because, due to high costs, automation of their work does not pay off. Erik Brynjolfsson and Andre McAfee of MIT Initiative on the Digital Economy point out that "it is easier to automate the work of an accountant, bank cashier or partially qualified factory worker than a gardener, hairdresser or home nurse. Over the past 25 years, the most resistant to automation have been occupations that require a certain amount of physical activity and sensory perception"<sup>36</sup>. The same authors draws attention to automated warehouses which eliminate thousands of jobs and the growing self-service and automated sales sector.

<sup>35</sup> R. Keister, P. Lewandowski, *A routine transition? Causes and consequences of change the changing content of jobs in Central and Eastern Europe*, IBS Policy Paper 05/2016.

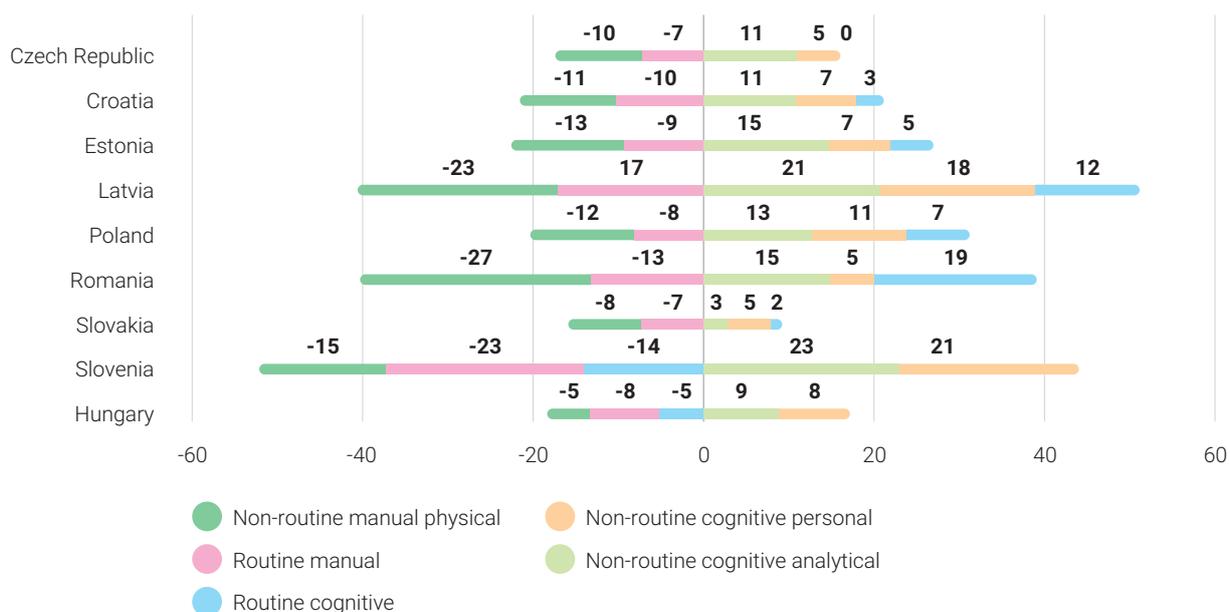
<sup>36</sup> E. Brynjolfsson, A. McAfee, *Race against machine*, 2015.

Keister and Lewandowski have analyzed the extent to which the individual tasks have changed over the period 1998-2000 and 2011-2013. They assumed that more specific tasks than occupancy are subject to automation. Using classification proposed by other authors, they distinguish following tasks:

- **non-routine cognitive analytical and interpersonal** (related to abstract thinking, requiring creativity, problem solving skills and above-average communication skills such as tasks executed by engineers, designers, ICT experts, management),
- **routine cognitive** (that require performing specific and repetitive sequence actions, easily replaceable by computers, e.g. tasks performed by sales persons, clerks, administrative support and cashiers),
- **routine manual** (can be represented in the form of an algorithm, can be fully automated, e.g. tasks performed by production workers, assembly workers, locksmiths),
- **non-routine manual physical** (requiring to adapt to a specific situation, understanding of language, perceived images and principles of social coexistence, e.g. tasks performed by drivers, farmers, miners, construction workers, waiters).

Results of their analysis show that the changes observed were similar in all CEE countries which were analyzed. The greatest changes were related to the increase of non-routine cognitive analytical tasks and to the decrease of non-routine manual physical tasks. It is worth noting the changes in Slovenia and Hungary, where the level of routine cognitive tasks have declined in the analyzed period. The increase in employee education and structural shifts are of significant importance for these changes.

Chart 3.4  
Total change in the task intensity of jobs between 1998-2000 and 2011-2013 in CEE countries



Source: R. Keister, P. Lewandowski, *A routine transition? Causes and consequences of change the changing content of jobs in Central and Eastern Europe*, IBS Policy Paper 05/2016.

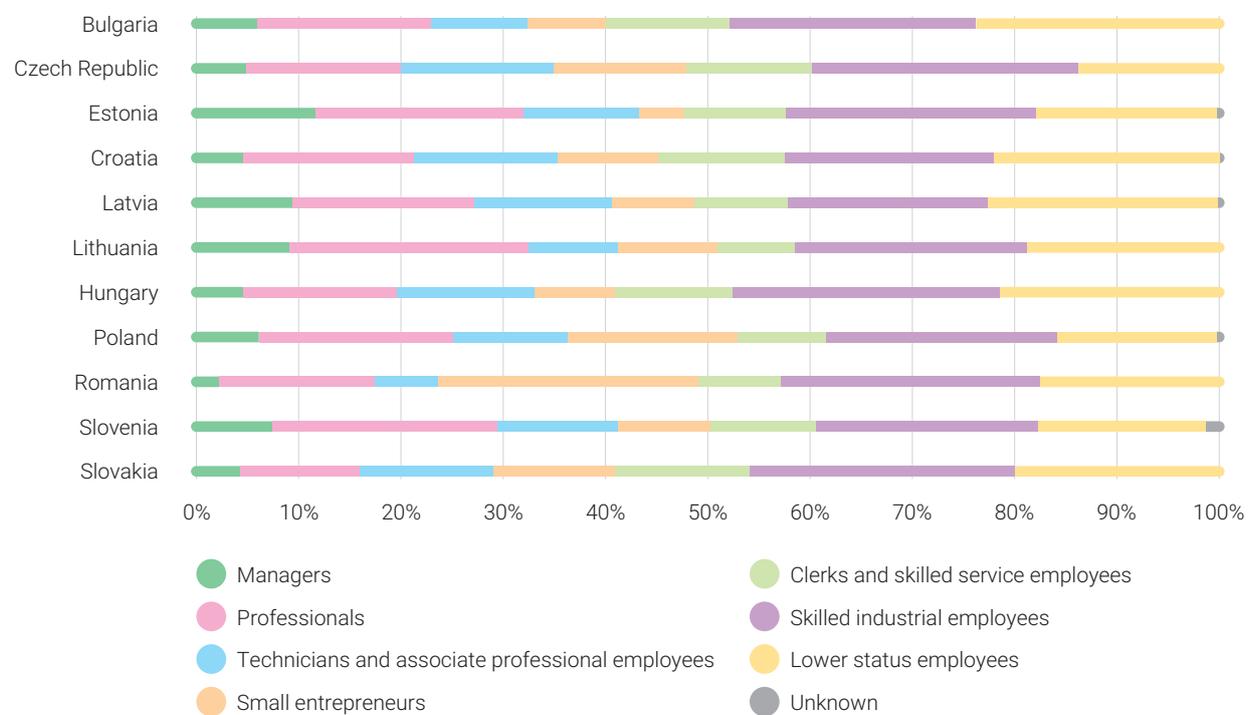
The most accurate explanations of changes in providing work, changes occurring under the impact of technological progress, are those provided by a conception based on changing tasks. The above analyses prove that it is easier to automate certain tasks than entire workplaces. At the same time the authors mentioned herein note that new occupations requiring new special qualifications emerge in lieu of those most vulnerable to automation.

**Who will get work in the future? First and foremost – computer scientists**

As has been proved before, the impact of technological change on the functioning of the labour market is uneven. There are groups of workers more and less at risk of displacement from the labour market through the development of new technologies. In the future, there will be a growing demand for highly qualified staff, with analytical and interpersonal competences, equipped with digital skills. Already today we are observing changes in the employment structure.

According to data on employment in CEE countries by socio-economic groups, the employment structures in these countries are very similar. The lower status employment and skilled industrial employees are predominant group in all countries (about 40-50%). Over the past few years, there has been an increase in the share of professionals amongst all employees. They make 11.7 per cent in Slovakia to 23.3 per cent in Lithuania. Romania stands out amongst the other CEE countries with a prevalent small entrepreneur group - one in four employees belongs to this category. Managers constitute the smallest group of employees.

Chart 3.5  
Employment by European socio-economic group in CEE countries in 2016



Source: Eurostat, Employment by sex and European socio-economic group (lfsa\_esegg).

The data from the Table 3.2 provide information on employment in main sectors of the economy. In particular, they show diverse employment in CEE countries against EU-28 countries. The service sector is predominant – every other employee in the CEE region finds work in this sector. Romania is the only country where employment structure is different from the EU average. Nearly 30 per cent of employees in this country work in the agriculture and mining sectors and just 38 per cent – in the services sector. Compared to the EU-28 average, in CEE countries much more employees are working in agriculture and mining industries, as well as in manufacturing. In general, despite the gradual modernization of the economy, traditional sectors continue to prevail in the employment structure. Share of High-tech in manufacturing sector and share of knowledge-intensive in services sectors are still low. This means that employees in the CEE region are more likely to work in industries where potential impact of automation and robotization is the highest.

Table 3.2  
Structure of the economy in CEE countries and EU-28 in 2015 (in %)

	Bulgaria	Croatia	Czech Republic	Estonia	Hungary	Latvia	Lithuania	Poland	Romania	Slovakia	Slovenia	EU-28
<b>Agriculture and Mining</b>	7.6	11.5	3.8	4.9	5.1	8.5	9.0	13.6	29.3	3.7	8.4	<b>5.1</b>
<b>Manufacturing</b>	19.9	17.2	26.6	18.9	21.2	13.6	15.4	19.0	18.1	24.0	23.0	<b>15.6</b>
of which High and Medium high-tech	18.6	20.6	40.2	21.0	41.2	11.4	12.1	26.5	27.6	41.4	37.0	<b>36.4</b>
<b>Utilities and Construction</b>	9.8	9.8	10.6	11.3	8.8	9.6	9.4	9.9	9.5	12.0	8.0	<b>8.6</b>
<b>Services</b>	55.0	54.9	52.6	58.1	55.9	61.5	60.2	50.7	38.1	51.7	54.2	<b>63.6</b>
of which Knowledge-intensive services	45.1	51.6	54.4	55.3	53.2	51.2	50.0	52.1	46.9	51.6	57.1	<b>58.0</b>
<b>Public administration</b>	7.7	6.5	6.4	6.8	8.9	6.8	6.0	6.7	5.0	8.6	6.3	<b>7.1</b>

Source: European Innovation Scoreboard, [http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards\\_pl](http://ec.europa.eu/growth/industry/innovation/facts-figures/scoreboards_pl)

According to current analyzes, researchers, engineers and ICT specialists are the least threatened groups. Within the ICT industry itself, new specializations are emerging, completely unknown just a few years ago. The programmers, Big Data specialists, enjoy the greatest interest. Comparative data from the Table 3.3 clearly show the increasing employment of these professionals in CEE countries. The highest level of employment of ICT experts amongst all employees occurs in the smallest countries of the region, i.e. in Estonia and Slovenia. It is worth noting that Poland employs more or less the same number of ICT specialists as all the other countries altogether.

**Estimates of the percentage growth of IT professionals and programmers vary across the EU. According to the forecasts of the European Center for the Development of Vocational Training (CEDEFOP), Lithuania will be witnessing the highest percentage growth until 2025 (by almost 50%) and the next will be Poland (by 30%). By averaging the results for the rest of the EU, the number of ICT professionals will increase by approximately 10-20 per cent. There is a high probability that after 2025 this growth will be even more dramatic.**

Source: CEDEFOP, <http://www.cedefop.europa.eu/pl>

Table 3.3

Share of science, engineering and information and communications technology professionals in total employment in CEE countries and EU-28 in 2011 and 2016

Country	2011		2016	
	in thousands	%	in thousands	%
<b>Bulgaria</b>	74.5	2.5	112.2	3.7
<b>Czech Republic</b>	132.1	2.7	200.1	3.9
<b>Estonia</b>	28.9	4.8	35.1	5.4
<b>Croatia</b>	48.0	3.0	49.4	3.1
<b>Latvia</b>	31.2	3.6	33.6	3.8
<b>Lithuania</b>	40.4	3.2	53.8	4.0
<b>Hungary</b>	149.9	4.0	188.0	4.3
<b>Poland</b>	543.8	3.5	645.7	4.0
<b>Romania</b>	312.1	3.7	357.4	4.2
<b>Slovenia</b>	46.1	4.9	48.4	5.3
<b>Slovakia</b>	56.5	2.4	59.5	2.4
<b>UE-28</b>	9,607.1	4.4	10,765.4	4.8

Source: Eurostat, Employment by sex and European socio-economic group [lfsa\_esegg].

The structure of employment in CEE countries proves that this region differs from the countries of EU-15. At the same time, an increase in employment in professions requiring high qualifications can be observed. However, a significant proportion of simple jobs may mean that their automation will not be cost-effective in the coming years and this will reduce the risk of technological unemployment.

# Conclusions

- The fourth technological revolution is increasingly affecting the functioning of labour markets around the world as well as the workers themselves; we are dealing with a transition to the post-Ford world, where values such as flexibility of work, interdisciplinarity, lack of attachment to the workplace and the need for continuous training are predominant.
- The threat of rising technological unemployment is the most discussed topic in robotics and automation.
- New technologies are accompanying workers performing simpler as well as more advanced tasks; they change the way work is provided, the relationships between employees and management team, they affect productivity.
- Year by year, sales of industrial robots is on the visible rise, mainly to the five most technologically advanced countries – China, Japan, the USA, Germany and South Korea.
- Researchers around the world are trying to estimate the extent to which machines and robots can take away jobs from humans – the most vulnerable are routine workers whose work can be represented in the form of algorithms.
- Least threatened occupations in the future are those requiring abstract and critical thinking, as well as jobs where soft skills, interpersonal are necessary; also graduates of social faculties and humanities, representatives of the ICT sector and managers can feel at ease in the future.
- Politicians and the key actors in the fourth technological revolutions are increasingly taking a stance in discussions about its consequences; however, the discourse takes direction according to which millions of workers will lose jobs in the future.
- The low level of technological advancement in the CEE countries and the significant share of traditional sectors in the economy (agriculture, mining, industry) will exacerbate effects – workers in these countries may more frequently lose jobs in the future than workers from other more developed countries.
- It is worth explicitly emphasizing that processes of work automation and the risk of a growing level of technological unemployment are still not the most essential topics with regard to the policy of the labour market in CEE countries. Changes described mainly by American researchers will gradually affect the majority of countries in the world. Real risk of taking away work by robots from humans will probably occur in the second half of the 21<sup>st</sup> century.

## Chapter IV

Mobility in the era of the fourth  
technological revolution

– can we tell anything today  
about the future of migration in CEE countries?

## **Introduction**

The processes of robotization and automation of work will affect increasingly larger groups of workers. Technological changes will be noticeable in the labour markets of most highly developed countries. At the same time, the fourth technological revolution coincides with growing demographic problems in the same developed countries. Societies are ageing, the size of the labour force is shrinking. Stimulating processes of immigration is becoming the solution to these problems. A sizable majority of EU countries are already willing to give employment to tens of thousands of foreigners. Both, highly qualified foreigners and those without any qualifications, can find employment there.

The expected increase in replacing human workers by robots and depriving them of their work will also impact the character and direction of international migrations. The dynamic growth of technological unemployment will find reflection in the situation of immigrants. On the other hand, technological changes with their influence on the labour market may contribute to pushing residents of CEE out of their countries.

This chapter aims to show potential migratory flows in the next decades of the 21<sup>st</sup> century. The most significant research and statistical data have been presented in order to show potential migration; among them are data showing labour mobility within the CEE region.

### **Migrants will always be necessary. But for whom is there work?**

By analyzing the 2014 study on the situation of migrants on the labour market ("ad hoc module"), we can indicate main sectors of employment of foreign-born (first generation of immigrants) in 15-64. According to the data in [Table 4.1](#), the structure of employment of immigrants (by occupation) in CEE countries differs from that in the main EU immigration countries. Interestingly, in the Czech Republic, Estonia, Croatia, Latvia, Hungary and Slovenia, there is a greater share of managers and professionals than in the EU-15. In all EU countries, immigrants work mostly in elementary occupations, as service and sales workers. Immigrants often find jobs as craft and related trades workers as well as plant and machinery operators and assemblers. It is worth noting that the CEE countries have a much more uniform employment structure than in other countries. However, these data do not allow to estimate the extent to which immigrants working in specific occupations are mostly jeopardized by automation and robotization.

Table 4.1

Employment status of first generation of immigrants by main group of occupations in selected EU countries in 2014 (in %)

	Czech Republic	Germany	Estonia	Spain	France	Croatia	Italy	Latvia	Hungary	Austria	Slovenia	Sweden	United Kingdom
<b>Managers</b>	6.4	1.5	6.1	1.4	4.9	–	0.4	6.9	4.4	2.6	5.2	3.1	8.5
<b>Professionals</b>	17.6	10.0	14.2	9.1	16.1	11.3	3.2	9.9	20.0	13.0	11.3	26.5	26.5
<b>Technicians and associate professionals</b>	10.9	13.8	9.5	3.3	15.1	14.5	6.4	15.4	12.0	11.8	8.5	13.4	10.2
<b>Clerical support workers</b>	7.1	8.3	6.9	5.0	7.8	11.0	4.9	8.8	8.3	7.2	6.9	4.3	8.4
<b>Service and sales workers</b>	13.2	14.4	11.9	23.4	19.7	20.2	22.0	11.2	17.8	20.1	12.1	24.7	20.4
<b>Craft and related trades workers</b>	15.4	17.9	18.0	10.9	7.9	19.3	18.4	12.1	16.0	15.3	24.0	7.7	4.9
<b>Plant and machine operators and assemblers</b>	16.9	12.0	17.8	6.6	8.4	8.9	8.7	11.6	10.1	9.2	13.7	8.2	6.7
<b>Elementary occupations</b>	10.9	21.0	14.4	38.3	17.6	12.4	33.9	22.2	10.8	20.2	17.5	10.2	13.9

Source: Eurostat, Employees by migration status, educational attainment level, occupation and working time [lfsq\_14leeow].

Projections presented in one of the previous chapters show that technological unemployment could affect a significant number of immigrants. A large number of them still find employment in manufacturing and in work based on routine tasks. In the CEE countries simple works, belonging to the so-called second segment of the labour market are performed mainly by immigrants. This kind of work is less endangered by automation and robotization. What decides here are low costs of labour and high costs of installing new technologies. In the coming years it will still be more cost-effective to employ seasonal labour for cropping fruit or for construction and redecorating jobs. Robotization of agriculture still remains tremendous challenge. Most fruit and vegetables can be picked by human workers only. These are the sectors where technological progress does not threaten at the moment. Also foreign women taking care of children and the elderly and helping in households do not need to worry about their jobs.

Information about potential demand for additional workers is also supplied by Eurostat-job vacancies. A job vacancy is defined as a newly created, unoccupied or about to become vacant post. For several years, in all CEE countries an increase in the number of job vacancies has been observed. The data from figure (Table 4.2) show from which groups of the classification of economic activities the greatest number of job vacancies appeared in the first quarter of 2017. In all CEE countries, manufacturing, public administration and defense, construction, and wholesale and retail trade dominate. Among five groups with greatest number of job vacancies, branches connected with industry and ordinary services dominate. These are of marginal significance, except for Poland and Croatia, have such branches as education or information and communication. It is worth noticing that it can result from different mechanisms of looking for employees with differing levels of competence – highly skilled workers are not sought, they are recruited, and that is why they may not be included in those statistics.

Table 4.2

Job vacancies by 5 main group classification of economic activities in CEE countries in Q1 2017



Source: Eurostat, Job vacancy statistics by NACE Rev. 2 activity, occupation and NUTS 2 regions - quarterly data [jvs\_q\_isco\_r2].

### Migrations – yes, but not everywhere

It is a truism that migrations have accompanied humankind from the very beginning. Readiness to move is observed all over the world. However, in modern times some societies are more or less inclined toward seeking better living conditions in other countries. For several decades a steady growth of international migrations has been observed. Intensifying differences in socio-economic level between the richest (North) and the poorest (South) countries will continue to lead to international migrations. It is the highly developed countries that primarily benefit from these flows. For them, immigrants are the solution to problems in the labour market. A question arises: which of the most developed countries can count on a steady influx of immigrants, i.e. potential additions to the labour force?

Information on the migration potential of population from most countries are provided by the results of representative surveys of Gallup World Poll. The latest edition indicates that 14 per cent of the respondents desire to migrate. That means that on a global scale the population of potential migrants amounts to 700 million people. The most recent edition shows that the most inclined to mobility are the inhabitants of Sub-Saharan Africa, from where every third respondent desires to migrate between 2013 and 2016. Another region, from which every fourth resident expressed the desire to migrate, are European countries not belonging to the EU. These are the inhabitants of Albania (56%), Armenia (47%), Bosnia and Herzegovina (36%), Moldova (35%), Macedonia (34%), and Kosovo (34%). Every fifth resident of the EU wishes to migrate. According to Gallup World Poll the least mobile are the inhabitants of Asia. The survey carried out by Gallup does not reflect the migration reality. It happens more than once that those data are far from the facts.

Table 4.3

Percentage of those who live in these regions who desire to migrate

	Desire to migrate, 2010-2012	Desire to migrate, 2013-2016	Change (pct. pts.)
Sub-Saharan Africa	30	31	+1
Europe (outside European Union)	21	27	+6
Latin America and Caribbean	18	23	+5
Middle East and North Africa	19	22	+3
European Union	20	21	+1
Commonwealth of Independent States	15	14	-1
Australia/New Zealand/Oceania	9	10	+1
Northern America	10	10	0
South Asia	8	8	0
East Asia	8	7	-1
Southeast Asia	7	7	0
Global	13	14	+1

Source: Gallup World Poll 2017 <http://www.gallup.com/poll/211883/number-potential-migrants-worldwide-tops-700-million.aspx>

With regard to the list of countries that most people want to migrate to, countries with long experience of accepting different groups of foreigners are prominent on it. The destination indicated most often is the United States. According to the Gallup World Poll estimates, 147 million people desire to migrate there (and this is about half of the present population of the USA). The second on the list is Germany (39 million) and Canada (36 million). Among other countries indicated most often, are United Kingdom, France and Australia. No CEE country was on the list of 22 classified countries.

### Ukrainians, Russians, Belarusians ... and who next? Where will the immigrants come from?

Opening up to immigrants creates more advantages than disadvantages for the host country. Developed countries are one by one becoming aware of this. Employing foreigners is, as a rule, complementary to native workers. Foreigners do not deprive natives of their work. Immigrants make up an significant group of consumers, non-nationals working legally are becoming a larger and larger group of taxpayers. They also contribute to their pension funds.

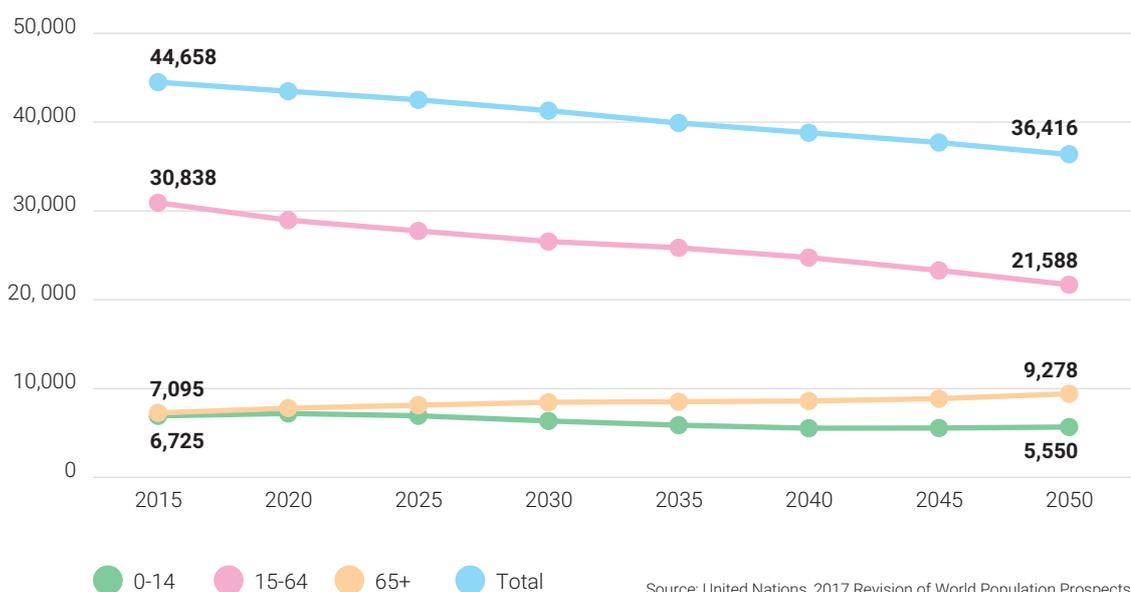
Also, CEE countries recognize the advantages of gaining additions to the labour force. Persons at the age of greatest activity are in greatest demand, those who have the most needed qualifications. An additional argument for employing foreign workers is their industriousness. As has been indicated in Chapter One, labour immigrants to CEE countries come, first of all from Ukraine, Russia and Belarus. What argues in favour of their employment are cultural affinities. Communication with them is easier (knowledge of Polish, Slavic languages are related). They integrate easier on the labour market. However, Russia, Belarus and Ukraine are post-Soviet countries. They face growing demographic problems. As a result of those processes, the migration potential of those countries will systematically decrease.

More and more often immigrant workers are rescuing the social security budget in the host country where they work legally. The data from Deutsche Rentenversicherung show that in 2008-2015 the number of immigrants paying social security contributions in Germany increased by 1.7 million and currently amounts to over 2 million people. In Poland, we similarly observe constant growth in the number of foreigners (mainly Ukrainians) who pay contributions for social security, namely pension insurance. According to data of ZUS (Social Insurance Institution) in Poland, in the second quarter of 2016 the number of foreigners who are insured amounted to 240,000.

Source: DW, Niemcy: Imigranci odciążają system ubezpieczeń społecznych, <http://www.dw.com/pl/niemcy-imigranci-odci%C4%85%C5%BCaj%C4%85-system-ubezpiecze%C5%84-spo%C5%82ecznych/a-39885058>, GazetaPrawna.pl, Ukraińcy ratują ZUS. Imigranci ze Wschodu zarabiają na naszych emerytów, <http://serwisy.gazetaprawna.pl/emerytura-i-renty/artykuly/999901,ukraincy-zus-imigranci-emerytura-ukraincy.html>

The United Nations demographic prognosis from 2017 shows that the population of Ukraine, which is the main country of origin for labour immigrants to CEE countries, is and will be gradually ageing. At the same time, due to depopulation processes, by 2050 its population will decline by more than 8.2 million (Chart 4.1). A still more pessimistic image is projected by the National Academy of Sciences of Ukraine. According to their demographic projections, the decline of population in the same period may exceed 12 million. The decline in number of working-age persons – by 9.2 million – will be especially unfavourable. This means that the migration potential, i.e. number of people who could take jobs in other countries will decrease systematically. By simultaneous growth in the number of people over 65 years, this will mean serious problems for the general functioning of the country. Migration movements might deepen the negative consequences of demographic processes occurring simultaneously in Ukrainian society.

Chart 4.1  
Population prospects for Ukraine in 2015-2050 (in thousands)



These projected changes may be particularly noticeable in those countries which employ the most workers from Ukraine – Poland, the Czech Republic and Slovakia. Since 2013 an increased influx of Ukrainians to those countries have been registered, which is the immediate consequence of both the political situation and the socio-economic collapse of Ukraine<sup>37</sup>. The Ukrainians, fleeing from poverty, unemployment and persecution had no problems finding their way in the labour market in CEE countries. According to IOM research the majority of the Ukrainians were males in the age bracket 30-44 years. Many of them (41%) possessed only primary or vocational education, only one in three had higher education<sup>38</sup>.

The greatest amount of research on Ukrainians in Poland has been carried out by scholars from the Centre of Migration Research at the University of Warsaw and proves that the neighbours from beyond the eastern border fill the gaps in the labour market in Poland. They perform work which the Poles are reluctant to take<sup>39</sup>. The alert appearing in public discourse that there is deficit of workers in Poland (or in other countries) has the effect that Ukrainians expect better and better conditions of employment. The abolition of tourist visas (for no more than 90 days) for citizens of Ukraine in the first half of 2017 is a new challenge for the CEE countries. Part of the Ukrainian immigrants may also take the risk of illegal employment, for example in Germany or Austria, where the wages are much higher than in Poland or the Czech Republic.

Russia is another significant country sending workers to CEE countries. Great territorial differentiation in that country leads to the situation where Russia is the largest country of emigration and immigration in the world. On one hand, a great part of the Russian society is interested in emigration to EU countries; for educational or business purposes, or simply to work. On the other hand, citizens from other countries: Ukraine, China, Belarus, Tajikistan and Uzbekistan immigrate to Russia. In spite of its demographic problems apparent from the beginning of 21<sup>st</sup> century, Russia is reluctant to accept immigrants. The country is suffering from depopulation (Chart 4.2). According to UN estimates, in the next 35 years the population of Russia may decrease by more than 11 million. As in Ukraine (and in most CEE countries), increase in population of the elderly will be observed by simultaneous decline in the number of people in the age bracket 0-14. Especially severe will be the loss of one fifth of the working-age population. The Russian government is undertaking measures to encourage young people to have more children. At the same time, they try to deter emigration<sup>40</sup>.

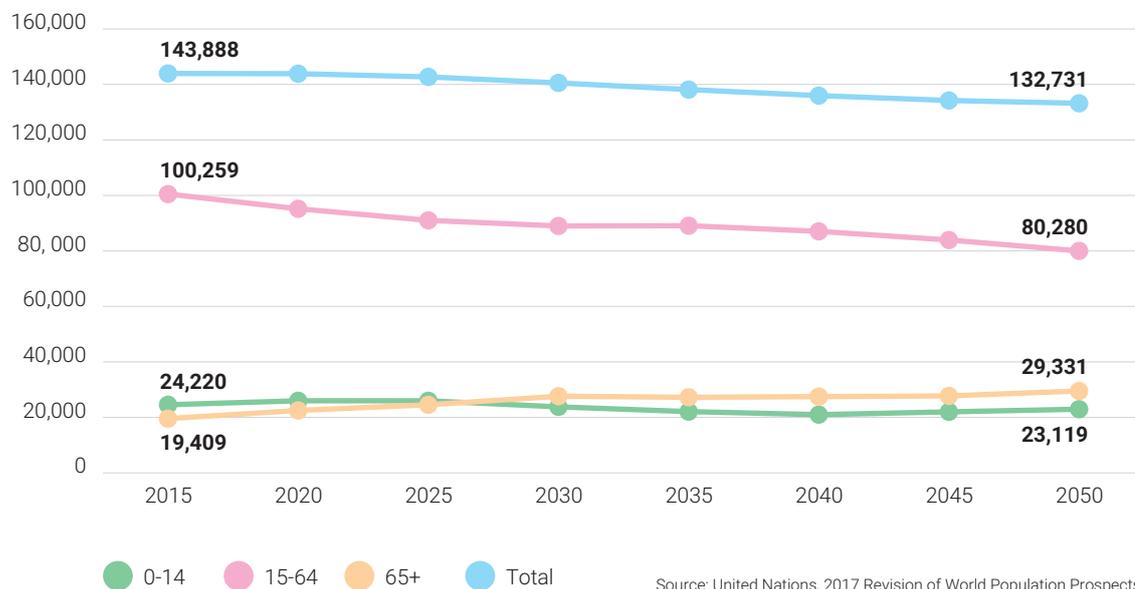
<sup>37</sup> M. Lendel, *Migration of Ukrainians to Central European countries In the context of the Postmaidan internal and international crisis*, *Public Policy and Administration* Vol.15, No4, p.549-563,2016

<sup>38</sup> *Migration in Ukraine: facts and figures*, IOM 2016

<sup>39</sup> NBP, *Obywatele Ukrainy pracujący w Polsce – raport z badania*, [https://www.nbp.pl/aktualnosci/wiadomosci\\_2016/20161212\\_obywatele\\_ukrainy\\_pracujacy\\_w\\_polsce\\_%E2%80%93raport\\_z\\_badiania.pdf](https://www.nbp.pl/aktualnosci/wiadomosci_2016/20161212_obywatele_ukrainy_pracujacy_w_polsce_%E2%80%93raport_z_badiania.pdf)

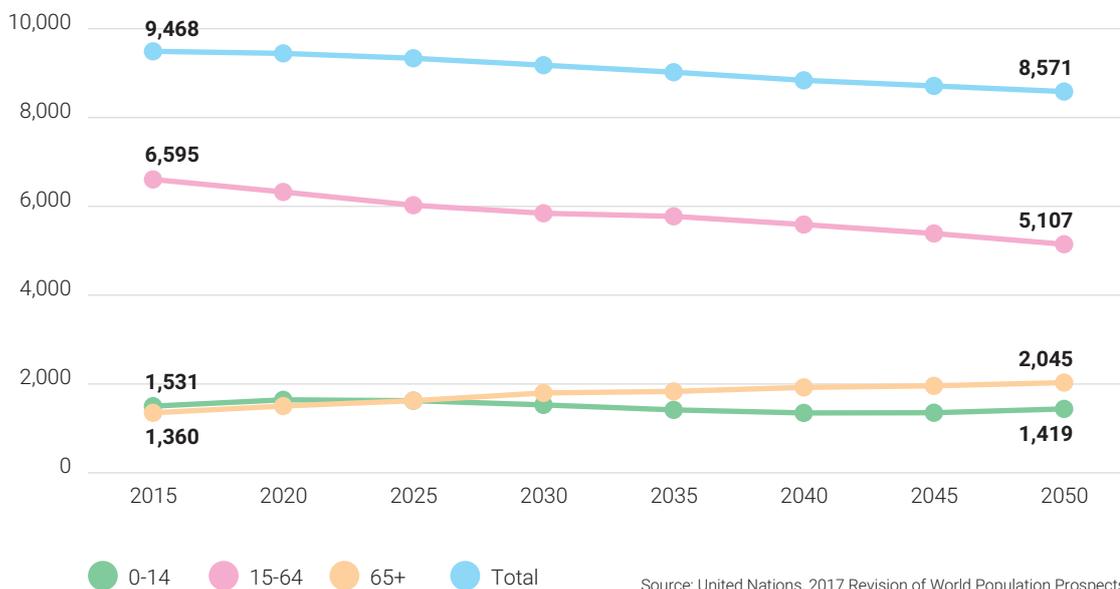
<sup>40</sup> T. Karabchuk, K. Kumo, E. Skoglund, *Demography of Russia. From the Past to the Present*, Palgrave Macmillan 2017.

Chart 4.2  
Population prospects for Russia in 2015-2050 (in thousands)



The third country which sends significant numbers of workers to CEE countries, namely Belarus, will also face negative changes in its demographic structure. Demographic processes, similar to those in Ukraine and Russia, may also weaken the migration potential there (Chart 4.3). A dynamic process of population ageing, together with falling levels of birth rates and depopulation processes are typical for all post-Soviet countries. At the same time, residents of those countries are characterized by much worse health indicators and shorter life expectancy than the citizens of EU-28.

Chart 4.3  
Population prospects for Belarus in 2015-2050 (in thousands)



A growing population of the elderly with a state of health relatively worse than that in the EU may bring about the necessity of care for these dependent seniors. Due to much worse material conditions, the citizens of those three countries will not make an attractive group of so-called retirement migrants. At the same time, further decline in births may result in decline of educational migrants. The citizens of Ukraine, Russia and Belarus now belong to the main groups of foreigners taking up education in CEE countries now.

In the future, the CEE countries will be compelled to open up for new groups of foreigners. In recent years, dynamic increase in first permits has been registered for immigrants from Turkey, India and China. Improvement in the economic situation in countries of the CEE region may lead to growth in its attractiveness for the inhabitants of the countries of Africa, Middle East and Asia.

### **Mobility for whom? Is it possible to estimate the potential for mobility?**

There is a lack of regular, comparative studies carried out in EU countries from which the migration potential of residents could be analyzed. This makes comparisons of European migration plans impossible. The results of surveys of public opinion conducted in particular countries are of interest. One of the more remarkable examples is the research realized by the biggest employment agency in Central Europe – Work Service. The research carried out every six months since 2014 shows which percentage of the respondents is inclined to go abroad seeking employment. The average percentage of persons who have decided to emigrate from Poland amounted to 12-21 per cent. The share of those who definitely are not planning emigration remains at the level 49.9-66 per cent. The number of those who hesitate is decreasing. It can be expected that further improvement on the labour market will encourage people to remain in Poland<sup>41</sup>.

IT specialists have a great inclination to emigrate. From research carried out by the Monster.com portal it appears that in eleven countries (Poland, Estonia, Lithuania, Latvia, the Czech Republic, Slovakia, Hungary, Slovenia, Croatia, Bosnia and Herzegovina and Serbia) more than half of the IT specialists interviewed are willing to leave their country and take a job in another country. Only every fourth of 4,000 of computer scientists interviewed is not planning to leave their country. The main motives encouraging emigration include: high earnings (57%), better possibilities of career development (41%), possibility of emigrating with family (41%), desire for interesting experience (38%), and the idea of work with high quality technologies and participation in important projects (34%)<sup>42</sup>.

**Some CEE countries have been introducing reliefs and incentives for the ICT sector for some time. Romania is a good example, where special tax exemptions for employees engaged in software development activities have been introduced since 2001. The Romanian government wants to keep programmers in the country as well as encourage ICT workers from other countries to settle down in Romania.**

Source: ZDNet, The land where skilled IT workers don't pay tax. Yes, it really exists, <http://www.zdnet.com/article/the-land-where-skilled-it-workers-dont-pay-tax-yes-it-really-exists/>

<sup>41</sup> Work Service, *Migracje zarobkowe Polaków*, Warszawa, maj 2017.

<sup>42</sup> Biznes Newseria, *Czy specjaliści IT zaczną migrować? Dane o zarobkach w regionie*, <https://biznes.newseria.pl/komunikaty/praca/czy-specjalisci-it,b1514781875>

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**Table 4.4**  
People looking for job by country  
in selected EU countries (4 August 2017)

Country	
<b>Italy</b>	63,925
<b>Spain</b>	53,402
<b>France</b>	15,973
<b>Romania</b>	15,150
<b>Portugal</b>	14,942
<b>Croatia</b>	13,703
<b>Poland</b>	13,548
<b>Germany</b>	12,074
<b>Greece</b>	10,652
<b>United Kingdom</b>	7,962

Source: EURES,  
<https://ec.europa.eu/eures/eures-apps/cvo/page/statistics?lang=pl>

The EURES data give information on the number of CVs placed on the portal by workers looking for jobs abroad. According to data from 4 August 2017, the greatest number of CVs came from Italy and Spain (Table 4.4). From the CEE countries, most of those who looked for a job via the EURES portal came from Romania and Poland. The three largest occupation groups are waiter/waitress, administrative assistant and foreign language teacher.

# Conclusions

- Available statistics as well as results of public opinion surveys allow the conclusion that in coming years an increase in the size of the immigrant population will continue all over the world.
- CEE countries are becoming increasingly attractive as destinations for third country nationals, but they are still losing out to countries of Western Europe.
- The process of ageing of the society as well as depopulation will affect to an increasing degree the societies from which immigrants to CEE countries come. Countries which use foreign labour to the greatest degree (the Czech Republic and Poland) will be compelled to open up to immigrants from more distant countries of the world.
- Research concerning emigration plans should be carried out among particular occupational groups – over half of the Polish IT specialists interviewed are planning to leave the country to find a job abroad, while according to the research of Work Service, not more than a dozen or so of persons interviewed are considering emigration in the coming 12 months.
- Most job offers at the beginning of 2017 were placed by German employers.
- In coming years, immigrants can count on a great selection of job offers in CEE countries since, in spite of emerging processes of automation and robotization, the number of job offers in industry, as well as in construction and ordinary services is growing.

## Chapter V

Labour market, mobility and fourth industrial revolution in CEE countries  
– challenges, problems and opportunities according to Polish experts

## **Introduction**

The field study aimed at verifying to what extent new technologies can change the labour market in Poland and other CEE countries. The author frames the hypothesis that the forecasts about new technologies taking work away from people are not plausible in the context of CEE countries. The greatest challenge for labour markets in this part of Europe in the coming years will be the increasing deficit of workers. Long-lasting influence of the results of the fourth industrial revolution will actually be noticeable not earlier than the end of the first half of the 21<sup>st</sup> century. At the same time, the author's opinion is that the access to new technologies as well as professionalization of work will bring about the intensification of temporary mobility and the disappearance of traditional long-term migration. Problems of the greatest challenges facing the labour markets nowadays formed the background to the interviews with the informants. Particularly relevant was the impact of changes in employment on potential migration.

## **Research methodology**

The research was carried out among experts from Poland. A total of eleven interviews were carried out between June and August 2017. The sampling of informants had a special purpose; the informants were young experts dealing with variety of problems such as the labour market, migration, new technologies, and economic policy. The sample included both academics and representatives of public agencies. They included economists, sociologists, representatives of social policy, IT experts, and engineers. They were all guaranteed anonymity.

### **The informants represented institutions such as:**

- Collegium of World Economy, SGH Warsaw School of Economics
- Faculty of Automotive and Construction Machinery Engineering, Warsaw University of Technology
- Polish Social Insurance Institute (ZUS)
- Youth Research Center, SWPS University (Warsaw)
- Faculty of Mathematics, Informatics and Mechanic, University of Warsaw
- DELab, University of Warsaw
- Deloitte Poland
- Institute for Structural Research (IBS)
- lukaszbialek.pl – Economy/Investments/Research/Business
- Work Service
- Polish Confederation Lewiatan (Konfederacja Lewiatan)
- IOM Poland

## The greatest challenges for labour markets in Poland and the regions of CEE

All the informants were unanimously of the opinion that, in the first half of the 21<sup>st</sup> century, the greatest challenge to proper functioning of labour markets in CEE countries included the ageing of populations, depopulation processes and the ongoing emigration of young people. Overlapping of these processes leads to problems caused by growing demand for labour. The people the author talked to emphasized that the current demographic processes will be especially sharp after 2020. The effects of demographic processes are compounded by other processes: incompatibility of workers' competence and qualifications with the demands of the labour market, and the professional activity of Poles which remains relatively low. However, one informant notes that *"nowadays ageing has positive effects, as it is still easy for young people to find a place in the labour market"* (R9). A high level of emigration by young people still remains a significant challenge in the region. One informant says: *"Poland loses by the emigration of young people, especially of those with high qualifications – it means losing valuable human capital. This makes the transformation to an innovative economy impossible. We clip our wings. In other countries the situation looks similar"* (R10).

One of the informants noticed the ongoing discourse about changes in labour markets. He reproached the commentators on the labour market for spreading somewhat schizophrenic views *"Because on one hand they say we suffer from a shortage of labour, and this problem will be increasing as an effect of the ageing of the population, on the other hand the same people maintain that very soon there won't be enough work for people and people won't know what to do with themselves. But these are two different time perspectives"* (R4).

The informants noted that, in the context of negative demographic changes, processes of automation and robotization of work can be, to some extent, the solution of problems connected with a shortage of labour. One of them states explicitly that *"after 2020 this problem will be solved by robotization, automation"* (R9). Robots and automats can replace humans in the sectors where there will be a shortage of labour. *"As demography exhausts us, automation may try to save us; this is our hope. Demography is the greatest threat to the development of Poland, and very much underestimated. The Polish economy is based on human capital – we have no natural resources, neither have we great respected actors regarding new technologies and patents"* (R3).

## The essence of automation and robotic processes

In the interviews the informants often referred to different aspects of the labour market functioning under the influence of technological changes. As one of them noted: *"(...) automation starts with work, but it stretches out through all our life, our lifestyle, the ways of spending leisure time"* (R5).

Particular attention was paid to the problem of costs involved in the replacement of human work by robots and computers. High costs of installing robots or systems which would replace ordinary workers have such effects that they are "produced" on small scale, so, they are still very expensive. *"(...) The industrial robot pays for itself in a few years; it works 24 hours a day and doesn't go on sick leave. A robot which would clean a surface for 100.000 PLN does not mean very expensive work"* (R8). The same interviewee adds: *"the more developed a country is, the sooner it will happen, as labour is expensive and technological cost is cheaper. Also, infrastructure is better there. Automation should be connected to electricity and to the fast Internet"* (R8). There are always technological constraints that preclude full automation of certain tasks.

Key is the role of possibilities of particular economic operators in implementing new technologies. Such technologies which affect the character of labour can be implemented by large companies. *"With us (i.e. in Poland) everything stands on small and medium enterprises, that simply can't implement this, they have no resources."*

*They are not able to have that kind of capital at their disposal, they are not able to control those financial connections in an advanced way” (R5). Implementation of robotization and automation take place in large companies that have capital at their disposal and are present in international markets.*

The possibility of implementing automation and robotization also depends on the economic potential of a country. Paradoxically, small, centralized countries can adapt new technological solutions more easily. It is confirmed by one of the informants: *“No large country adapts new technologies fast. Small countries have great flexibility, it is the like management of a city. That’s why Estonia is successful here, there are no large regional differences, it is one big city” (R9).*

Processes of automation and robotization do not concern all branches and occupations to the same degree. It is related to technological possibilities which are applied in the production of industrial or service robots. *“It is much simpler to produce a robot which will assemble a mobile phone, than to create one which will pour beer. All industrial robots have defined space, they are programmed to a certain combination of movements, they do not measure distances, they do not have to calculate” (R8), one of the experts, notes. The sector of personal services is especially resistant to technological change. And it is in this sector (among others care for the elderly, childcare, domestic services) that immigrants can count on employment both now and in the future.*

### **Occupations of the future**

The interviewed experts were asked to point out three occupations which, in their opinion, are the least threatened by automation and robotization. All of them mentioned professions connected with the ICT sector (Information and Communication Technologies). Some of them made it more precise: among the ICT specialists they mentioned Large Data specialists, mobile application programmers and data science specialists. The demand for automatics and robotics specialists will increase. The experts added that occupations which have a future are those which require creative and analytical thinking. At the same time, one of the experts noted that *“for 30 years, technological progress has had this characteristic feature – it has been complementary for educated workers and has replaced those with low qualifications. Automation causes increase in employment of IT specialist, engineers, and managers and a decline in employment of persons with low qualifications” (R8). An increasingly large role will be played by tasks connected with controlling the realization of work by automats. “More and more often, workers perform quality control, here automation is not possible, the human worker is needed” (R3).*

The informants notice the important impact of population ageing in the sphere of employment. They pointed out that the demand for caregivers of the elderly will increase. At the same time, in case of this field, there will be security of employment, and new technology in the field of tele-care will do no more than support the caring services. Also, medical professions were noted. Personal contact plays the key role in them. The least threatened are professions based on interpersonal relations, soft skills, and communicative skills. *“Professions which are connected with contact with other people, where that contact can be preferred or indispensable – some caregiving services, therapists, psychologists, they may survive” (R3).*

### **The most threatened occupations**

The informants were less unanimous about occupations most endangered by automation and robotization. Professions mentioned were those based on routine, repetitive tasks. Interestingly, the experts interviewed also mentioned occupations that often require high qualifications and suitable professional training.

Some experts interviewed agreed that one of the most threatened groups consists of bank employees. Digitization of bank operations leads to closing stationary bank branches. However, most bank employees find jobs in

the same branch: *"Once there were bank branches on every street, more banks even than pharmacies. Now they are moving away from that, it doesn't pay any more. Online banking and mobile banking have displaced those bank branches"* (R5). Another informant thinks the same; he notes that *"the only victims of automation or new technologies on the Polish market are bank employees who are made redundant. But please, notice, that it is the sector which is in the red., with regard to employment, a great part of the staff find work in other departments, they migrate within the corporation"* (R3). Another informant noted that, for example, in investment banks the position which is most at risk is the that of a trader – *"in the future decisions will be made by algorithms. Algorithmic trading, without human intervention. Algorithms make decisions looking at data, and those algorithms, looking at historical data, can make still more accurate decisions"* (R2).

Other employees whose work is related to finances can be at risk as well. One of the experts interviewed noticed the slow process of displacing employees by computer programs; which in his view is positive. *"In finances, in settlement, in accountancy, all this could be easily automated. It even behooves us to do so, people are not always that reliable, they skew reality, do not meet deadlines, they could be easily replaced. For example, if there is a problem, the program will optimize, analyze, and look for the best solution, for example where costs could be cut. But that is a matter of finances also, because to introduce a program we will need people who will describe the problem, and then programmers and people who would introduce it"* (R11). Taking away part of work from some employees brings about the emergence of new tasks for others.

Some of the experts emphasize that engineers can be threatened on the labour market as well, especially engineers performing simple routine tasks which do not require creative thinking. *"The work of engineers who do not act in a creative way, but pursue projects cooperating together in a group, can be completely replaced by machines. The machines will learn subsequent schemes of structuring. This is happening in Poland now, this trend, further training in engineering, this can soon lead to a situation where those people will not be able to find suitable work"* (R7). Another informant added: *"Even the engineer in a factory will have less work, as the reports, accounts, analyses he used to prepare will be produced by algorithms and computers. The jobs that will remain will be more intensive for the authors of work, and knowledge-related"* (R1).

Part of the interviewees point to jobs in the administrative sector as those which can be easily replaced in the future. This is influenced, by digitization of administration and the emergence of platforms of e-administration, among other things. They judge those changes positively, as they contribute to shortening administrative procedures, are much more convenient, and are generally time-saving. Among those whose jobs have a potentially high degree of automation are the workers of call centers, who *"will be displaced by artificial intelligence, able to solve problems of persons calling"* (R3).

The most noticeable example of replacing humans are self-checkouts. More and more supermarkets install them, as, for example only one employee is necessary to attend to 8 checkout counters. One of the informants, however, notes the paradox: in spite of the implementation of self-checkouts, in the sector of retail trade a great shortage of labour can be observed. *"The workers of this branch are in greatest demand – in the storeroom, in the meat department, and for displaying goods on shelves – nobody has invented a machine which can display goods on shelves"* (R7).

The experts interviewed also noted that among other jobs threatened by automation are those of drivers and taxi drivers. They mentioned autonomous cars that have been tested in American cities for some years. These solutions are not likely to appear in Poland and other CEE countries, primarily because society feels resistance towards vehicles without drivers.

## Poland and other CEE countries

In the conversations the experts interviewed focused mainly on the context of Polish society. That is why they were also asked a question concerning a broader context, namely about changes on labour markets of the CEE countries in general. Most of the informants noted that the process of the fourth technological revolution in the region is proceeding in an analogous way. This results primarily from similar history, similar economic processes, and from joining the EU at the same time. *“Environments and challenges are common, that is, how to pass to the new stage in economy, where the part of modernization process in this region after the change of the political system was based on the integration with Europe and on cheaper labour”* (R1).

In the sphere of technological change the CEE countries differ considerably from other, highly developed countries. As one of the interviewed experts noted, it is France, the USA, and Japan that are the leaders in the new technologies. He adds: *“Light years to catch up with them, we will never catch up with them. We are open to direct foreign investment, those which open factories here and logistic branches and modern call center services”* (R6). And they are, however, precisely the sectors which are at great risk of taking away work from people, replacing humans by new technologies and robots. The same informant points to the example of Poland, the country that competes, first of all, on cost and quality of work. *“Poland still remains in the interest of international corporations, because we are the labour market, in which you can find highly qualified workers who speak foreign languages and we compete on cost of labour. We are 3 to 4 times cheaper. We succeed in the competition through price and quality of labour. The processes connected with automation will appear later, it still pays for corporations to invest in the CEE countries in search of less expensive solutions in the production of different products”* (R6). In the opinion of the informants, the region of CEE countries is still characterized by cheap labour.

Another expert interviewed noted that the threats to labour markets in the CEE region are the same. Like other informants he emphasized the question of lower costs of labour in this part of Europe – *“In the countries of our region, there is a decline in manual labour, we depart from physical work, to great extent it is related to declining employment in agriculture. Here, there are no giant differences between particular CEE countries, no fundamental disparity in labour markets of the Czech Republic, Slovakia or Hungary. The risk for our region is that if technology becomes cheaper, wages will increase and the countries further east of us will improve their competence, it may turn out that work for people in our region is no longer cost-effective. And this may be a shock”* (R8).

Particularly similar is the way those processes are proceeding in the countries belonging to the Visegrad Group. One of the experts explains: *“The Czech Republic, Hungary, Slovakia and Poland are the countries that face similar problems. The Czech Republic and Hungary have already grappled with the problem of recruiting sufficient labour earlier. Romania has the most emigrants. The Czech Republic had no population boom such as we had. Poland is the only country which has such regulations for Ukrainians – the Czechs and Hungarians have started the debate on how to gain Ukrainians. The Czechs benefited from the Slovaks, but this source is already drying up. The Czech Republic will be the first country where the processes of automation will be implemented”* (R3).

One of the interviewees paid particular attention to Hungary where there is a problem *“(…) with supply of labour – not only low-skill workers are needed but also highly qualified persons. There is suggestion of a change, of a more open immigration policy, of greater openness to Ukraine. Earlier, there were voices that we are short of labour, now there are official voices telling about that necessity, about this change. This change dates from last”* (R1).

Some of the informants emphasized explicitly the distinct character of Estonia among CEE countries with regard to implementing IT solutions in the economy. One of them even noted that Estonia is closer to Scandinavian countries. Another expert emphasized the difference in strategic thinking about processes of building an information

society – *“in Estonia they started dealing with digitization at a very early stage; where else can we find such a systematic approach? They think about digitalization at every stage”* (R1).

### **When will the effects be noticeable?**

Due to dynamics of change in the global division of labour and the pace at which new technologies develop, it is difficult to predict nowadays when the most serious changes will take place in the functioning of labour markets. All informants agreed that those changes will increasingly affect the CEE region as well. One of them notes that *“probably a society without work may be less sound than the society in which work will be preserved in this or that form. This may lead to the situation where new problems and social pathologies will emerge”* (R1).

One of the experts interviewed compared the process of automation to a Yeti – *“everybody speaks about him, but nobody has seen him. But this is a Polish point of view. In Poland, nowadays, lower status employees with low qualifications are needed, who, for some years should have been displaced in the Polish labour market by new technologies, by work automation. We won’t see it for many years, the way it is taken granted by labour markets in the United Kingdom or the US”* (R3).

According to other of the interviewees, noticeable changes will occur no earlier than after 2030. *“The Polish economy is still based to a considerable degree on human work and transition to eliminating it in favor of modern technologies may occur after 2030. And this will bring the perspective that we are short of jobs after 2030”* (R4).

The interviewees presented a reasonable approach to processes related to automation and computerization of work. All of them predict that the changes will take place in an evolutionary way, not in the form of a revolution. One of them adds – *“there is no reason for fear, the changes will be gradual, rather evolution than revolution”* (R7). The changes will not occur overnight, theoretically there will be enough time to prepare for them. In the context of employment the changes will be implemented gradually, slowly. As one of the interviewed experts noted *“the process will be so slow that nobody will notice it”* (R11).

### **Taking work away from humans?**

Particular attention in the interviews has been paid to the probability of depriving humans of work as an effect of introducing robots and new technologies in work places. The interviewees are unanimous that automation will change the place of work. According to them, in many cases, using robots will make work easier for workers performing their tasks in difficult conditions. The example of the mining industry and coal miners has been indicated. Subsequent development of advanced mining technologies can be a solution which would eliminate risks for the health and life of workers.

One of the interlocutors refers to the specific case of office work. *“Technologies do not replace entire workplaces, they replace particular chosen tasks. For example creating case bases in the US is a routine task. A solution has present there for fifteen years, it is not necessary to employ hordes of employees to browse bases of sentences from the 19<sup>th</sup> or 20<sup>th</sup> century. Some tasks will cease to exist, but this does not mean there will be no work at all”* (R9).

Some of the experts interviewed noted that the capabilities of the systems and the algorithms are still not overly effective. *“Much more time will be needed before the algorithms reach a level of effectiveness, such that they would displace a living person, for the time being at least. Algorithms support man. Everything is aimed at making work faster*

*and more economical. If it pays off to install self-checkouts, the chain stores will probably do it, depriving their employees of work. The government can't do much here"* (R2). Another interviewee adds that *"it is not so easy to express it in terms of mathematics: the more technology, the fewer people necessary to do the work. If it were so, then since the first steam engine appeared there would have been fewer and fewer people employed. And it is quite different"* (R3). The probability of replacing human work by machines in those areas is still not so great.

Processes taking place in the labour market as a result of technological change are presented as a threat. A rhetoric of scaring society prevails, making people afraid of the possible consequences of the processes. It is *"this fear, the fear that machines will be faster, will think more logically and may turn out to be better workers than humans"* (R4) as one of the interlocutors notes.

Two interesting views have appeared among the arguments saying that people will not lose their jobs en masse. According to one of the experts interviewed, implementation of changes depends on the age of policy makers and managers of companies – *"those who rule are often elderly persons, whether ministers, or members of parliament, or the presidents of biggest companies – and that guarantees that persons of 40, 50 or 60 years of age will not lose their jobs that fast"* (R5). Another interlocutor emphasized that people will not lose jobs in great numbers because *"there will always have to be someone who will supervise the production process of the machines, companies will not run themselves in an impersonal way"* (R5).

One key factor limiting the emergence of technological unemployment is the low cost of human labour. It was often emphasized by the experts interviewed that it is still more cost-effective to employ workers than to invest in new technologies. And this is a characteristic feature of labour markets in CEE countries. *"From a practical point of view, it will be cheaper to employ a woman for 100 years than to buy a robot. If something has to be cheap it must be produced on a large scale"* (R11). Another interlocutor is of a similar opinion – *"Man is still a cheap production resource in Poland, and for some time it will not be different. Robotization (author's note) is a considerable investment expense, it increases the cost of running a firm, you have to guarantee support service and an installer; these are great costs, great expenses. As long as there is access to cheap labour, such decisions will not be made"* (R4).

Using robots and automats to perform human work has, in many countries, the character of a marketing activity. This is also the case with 3D printing. *"For the time being, over the next dozen or so years it won't pay. It is cheaper to hire a work team. Well, with the printer it might be faster, but the printer itself is very expensive. And foundations should be dug by people anyway. We prefer to print out single elements, an employee is still necessary, especially an educated one, as he will have to operate the electronics and all that equipment"* (R11). It will still be a long time before construction of buildings with the use of 3D printers will be no more than a departure from the norm in CEE countries.

### **Challenges for socio-economic policy**

An opinion prevails among the experts interviewed that the processes characteristic for the so-called 4.0 economy present enormous new challenges for highly developed countries. Projected changes, involving transformations in the world of work, will have an impact on numerous areas of social life as well as on the functioning of the state. They can lead to positive effects, but they also present a real threat to the proper functioning of both the state and society.

The most important challenge for the socio-economic reality in the age of the fourth technological revolution is to protect workers from negative consequences of automation and robotization of work. The lack of control of the processes mentioned may lead to the emergence of large numbers of so-called technological unemployed.

And this will escalate problems of viability for social security systems. Persons deprived of their jobs who at the same time have no other marketable qualifications or competence will be forced to apply for social assistance. If the number of years of work completed is not sufficient for old age pension a person will have to live on social assistance and the population of people living on all types of dole and benefits will be increasing. This is the possible perspective indicated by one of the interlocutors adding that the scenario is highly possible especially due to the growing problems of pension systems in an ageing society.

More and more often, rapid development of new technologies and computerization of social life require proper training. Knowledge becomes quickly outdated, and the necessity of permanent education arises. Quick access to up-to-date information makes the base of the information society and the knowledge-based economy. So, further development of the third-level education in all CEE countries is to be expected. On one hand growing aspirations of young people, on the other the necessity of high qualifications and specialized knowledge, will give rise to new fields of studies associated with the ICT branch, or biotechnology or robotics. Both the institutions of higher academic and vocational education will have to respond quickly enough to demands reported by employers.

Another challenge is the functioning of research space and creating proper conditions for realizing projects in the fields of robotics, automatics and ICT technology. One of the experts interviewed, a representative of that community, notes: *"enormous funds are necessary in order to employ a large staff of scholars and to give them possibilities of performing something, of constructing new prototypes. It is true, there are departmental funds, and there is the National Centre for Research and Development. In spite of them, the transformation is mostly stimulated by private capital. Companies that wish to implement something in a short time and have the money, can simply order and the process goes on. If the case has to run along scholarly paths, university paths, paths of projects, it becomes a bit blurred. What companies are concerned about is earning money; it is the market that verifies this. Industry still does not trust universities. Technology is proceeding, is moving forward, universities are, to some extent, left behind. Universities have still another mission, that of teaching, they must agonize over finances, reporting, and administration, they are not able to keep pace with the market"* (R11).

One of the interlocutors notes that intensive changes in the world of new technologies can lead to increasing groups of older employees being digitally excluded. *"Older generations are not as well trained, they do not learn fast enough all those skills connected with automation and with new technologies"* (R5). This is a special threat in the situation of the ageing labour pool in all EU countries. In most occupations the idea of lifelong education will become the norm.

The issue of technological change may become a new level of dispute between employers and employees. One of the interviewees mentioned the threats that emerge when trade unions stand up against changes resulting from legislation adapting to new reality. *"Trade unions contest the need for changing the paradigm of employment and of providing work. Here there is a threat that by international division of labour Poland will be left out due to this effect of inertia in creating the environment for economic activity"* (R4). Disagreements that arise and the lack of dialogue between representatives of employers and employees may make the proper realization of labour market policy impossible.

Regulations in the area of labour law pose tremendous challenges requiring definite solutions in the near future. One interviewee emphasizes special significance in the functioning of this area of labour law, adding that changes occurring there are the slowest and most difficult – *"and this is precisely the topic that seems to be the burning issue, how this work will look in the future. In order for the work to be there in the future, the preparation of a regulatory sphere is necessary. Most certainly the work will not look as it is now. We have to open up to quite new things in this sphere. We should collect the different solutions which stack up somewhere and adapt them to our labour law, so that companies which are managed in a modern way cannot say that this is such a difficult market to act in because it is impossible"*

*to act as one would anywhere else*" (R4). This makes a challenge for domestic labour market policies that, while grappling with deficits of labour and ageing labour resources should, at the same time implement legislation responding to the needs of the fourth industrial revolution.

### **The impact of automation and robotization on migration**

The key element of the interviews was to ascertain to what degree the changes related to automation and robotization can impact international migration. The topics brought up thus far have allowed us to outline a broader background describing socio-economic changes characteristic of the fourth technological revolution.

All the informants pointed out that migrations belong to the key processes shaping labour markets in the CEE countries. Some of the interviewed persons pointed to migration in the context of demographic changes and increasing demand for additional labour. One of them notes that Poland *"in the perspective of next ten years will still need ordinary workers, but also specialists, in healthcare for example"* (R9). One of the experts pointed out that immigration can be particularly important in the era of the fourth industrial revolution. Immigration means diversity and *"diversity fosters innovation and creativity. Polish companies are beginning to slowly acknowledge it and appreciate"* (R12).

Digitization of jobs will not have great significance for the immigrants arriving in Poland (or in other countries as well). Another interlocutor adds: *"poorly educated immigrants work either in ordinary services or in agriculture, or as construction workers. From the point of view of work automation, those are not the sectors which are primarily threatened"* (R8).

Another threat may lie in the immigrants' growing aspirations – *"more and more often we see that native workers do not want to work, for example at checkout counters, they do not want to perform simple jobs and this gap could be filled by immigrants. The question is, to what degree immigrants will be willing to perform the same task for 20-30 years, or will they not want to improve their position?"* (R7).

Some of the experts interviewed consider immigrants to be a specific category of workers. According to another interviewee *"many immigrants think of having a job here and now. They do not think in terms of wondering whether in twenty years they will be replaced by a robot. The immigrant wants to earn money here and now. But they do invest in their children, so that they can develop and have better living conditions"* (R7).

Two of the interlocutors emphasized another aspect related to immigrants and technological progress. Migrants, even those coming from poor countries, more and more often have mobile phones with access to the Internet. The fact that the immigrants are equipped with new technology may change in a revolutionary way the movement of immigrants on a global scale. One of the interviewees gave following explanation to that link – *"on arrival immigrants have often got mobiles, and owing to new technologies they learn how is it like in this or that country, and where conditions are good and where the best social benefits are. And so, that can influence the choice of the potential country. Owing to the Internet reaching to so many places, one can obtain information about various countries. Access to the Internet is one of the reasons why one makes decision to emigrate"* (R7). Another interviewee notes that being an immigrant often forces a person to achieve basic digital competence – *"I hear from the immigrants that they didn't use new technologies before migration. Only when they found themselves far from home they learned how to use Skype or a smartphone"* (R5).

Another expert thinks very similarly: *"Access to information is so easy now that we immediately know about something that has happened, we know that others live differently. This digitization and revolution also does make that information more accessible, that people communicate with each other, that they can more easily tell what and where."*

*This also influence the fact that more and more people are migrating. Ability to keep in permanent touch with those we leave behind is also a condition that makes it easier for people to take decisions to emigrate” (R12).*

In the conversations, one more topic concerning migration emerged. The interlocutors agreed that demographic processes, as they are observed nowadays, will lead to the situation when the migratory potential from the CEE countries will gradually run out. The impact of those changes on the possibilities of migration has been aptly put by one of the interlocutors: *“we will run out of migration potential, and that decreasing number of people coming onto the labour market... they will have a dilemma - whether to enter the labour market in their own country, or to go somewhere else. There is quite a large risk that many of them will be interested in emigration. It is highly likely that our GDP (Gross Domestic Product) or GNP (Gross National Product) will be low, caused by low employment levels and by a high demographic burden, which will bring about high costs imposed in the form of a tax wedge. Poland will not be an attractive country, it will not attract even those from the East” (R4).* Another informant thinks alike, yet he adds: *“We will have less to offer to those who arrive here. But migration will not be stemmed. For ages, it has been so that those who have a bad life go where life is good” (R6).*

### **Mobility in the age of the fourth industrial revolution**

All the interlocutors have noted increasing mobility on a world scale, at the same time emphasizing the change in its character. One of them indicated that the definitions of migrations applied nowadays have the character of reducing definitions. *“Young people and students can go abroad to work but they will never be included in the migration statistics. We can miss many strands and many people practicing a lifestyle and a career connected with movement” (R5).*

As one of the researchers of migration notes, we will most likely see increasing interest in short term migration with frequent change of residence. *“Everybody speaks about migrants as people who move with suitcases. We think about migration as one-way journey. Today migration is much more fluid and flexible; digital technologies cause migration to become something natural” (R3).* Common access to mobile technologies facilitates labour mobility. *“This mobility is no longer perceived as mobility, and in general we don’t look at them as at migrants who pack their suitcases and leave permanently. Nowadays, migrants are equipped with new technologies and have the facility to relocate. Users of new technologies feel they are global citizens; what has changed is the sense of belonging” (R11),* adds one of the experts interviewed.

Increasing labour mobility results from changes in the way work is performed. In the 21<sup>st</sup> century work is increasingly not ascribed to a specific place. One of the experts noted aptly – *“work is becoming the way of discovering the world. There are so many free-lance occupations possible to practice in every corner of the world. Freelancing ...this will develop faster than automation. It doesn’t matter where the worker is. The number of such occupations is increasing; we will observe increased mobility” (R3).* Another interlocutor noted a lack of regulations in this area, which leads to situations where practicing remote work is often illegal – *“Something like working hours has increasingly less significance; work can be joined with leisure, with visiting the world. But it doesn’t comply with labour legislation. If a worker is employed full time he must be on the premises of the employer, he must work eight hours etc., that is why working in the hours desired is legally forbidden. In contrast, a freelancer who regularly gets the mail with tasks from his employer somewhere outside the premises should be employed on contract. Such are the paradoxes in Polish labour law” (R4).*

Two of the experts interviewed paid particular attention to threats to social security and public finances resulting from increasing worker mobility. Lack of permanently defined place of employment may put both the employee and the state at risk. One of the interlocutors noted: *“That requires quite a different construction in the system of social security, and in the tax system, as nobody knows where and who pays taxes. But it is not that simple” (R8).*

Another adds: *"International freelancers are a fascinating challenge for the social insurance system, for the economy and for the state, as direct taxes no longer have any significance. Mobility maybe a threat to the sector of public finances; probably we will pay them with property taxes or taxes levied on consumption, rather than personal income taxes, because the latter will be less tangible"* (R9).

### **What action can be taken?**

All the experts interviewed noted that none of the developed countries are now ready for changes related to automation and robotization of work. The actions taken in the CEE countries were evaluated in a particularly negative way. Except for some system actions in Estonia, no country of the region takes substantive legislative or preventive action. *"The problem of action by government institutions is that they are always taken with a time lag; that is, the social problem appears first, and only then is there a reaction and a remedy for it. Preventive actions are not so frequent"* (R9).

Another interlocutor noted the context of Poland and adds: *"neither the previous nor the present government has one transparent idea concerning solutions of socio-economic problems. There is too much chaos in the solutions which are often contradictory to each other. There is no proper person, no proper program; I don't remember any decision-maker talking about it seriously. There are institutions such as universities and centers where they do deal with this problem"* (R6).

Taking actions on many levels becomes a necessity and poses a great challenge. Examples of countries and regions exist where attempts are made at implementing gradual solutions aimed at protecting employees against technological unemployment. Quite often, a need is noticed for legislative changes that would respond to challenges of the 4.0 economy. The experts interviewed pointed to different examples of measures that could be taken in highly developed countries. The list of such measures is not final; it relates to the situation of Poland and other CEE countries:

1. The reform of the vocational and higher education system.
2. Cooperation of business and central administration.
3. Starting to develop digital competence at primary school level.
4. Introducing Unconditional Basic Income<sup>43</sup>.
5. Introducing shorter working hours and flexible time.
6. Raising the level of activity on the labour market.
7. Activity in the areas of policy referring to immigration and to return migration.
8. Introducing working time accounts in labour legislation.
9. Carrying out academic research among various kinds of recipients before new technological solutions are implemented.
10. Evaluation of the work done by robots and automats and of using new technologies in particular work places.
11. Access for immigrants to education and to develop their skills.

<sup>43</sup> Unconditional Basic Income is a concept from the area of social policy in which all residents of a political unit are granted financial transfer payments not depending on fulfillment any criteria.

One interviewee thinks that *“we should apply brakes to the development of robotization and automation. Both theoreticians and practical businessmen can do it without problems. It is only a question of making the decision”* (R6). The same expert supports the idea of multidimensional responsibility for automation and robotization processes. *“If new modern technologies do improve the quality of social and economic life, then they are necessary. We have to invest in them, but this should be done in a responsible way. At the level of the UN, OECD, or UNCTAD representatives of the world of science should be present along with those who are closer to ordinary people as they present prognoses and analyses that would show threats due to ongoing robotization and automation, one of those threats being that people will lose jobs”* (R6). He maintains that international institutions play vital a role in shaping the socio-economic order. The largest organization should be characterized by responsibility in offering reforms in labour markets. *“Governments or international organizations should pose and answer the question of whether they should accept that. One should ask what can happen to people who suddenly begin to lose jobs. Let us ask if we want a society in which ¾ of people are not needed in any jobs”* (R6). The author of the above statements argues that technological progress, its scale and direction, depend on measures taken by key decision-makers both on an international scale and in particular countries.

# Conclusions

- Processes of automation and robotization are not yet the most important matters which impact labour markets in CEE countries; at present, most challenges result from the changing age structure of the societies in question. They must also cope with the still incomplete process of transformation of labour markets.
- As long as employing a human pays off more than implementation of ground-breaking technological solutions, robots will not pose a threat of substitution to workers. It is especially relevant to the CEE countries which are distinguished by the lowest costs of labour in the EU.
- A dynamic increase in technological unemployment in the CEE countries may occur at the end of the first half of the 21<sup>st</sup> century, when processes of automation and robotization of work will become more common.
- Technological progress in the workplace facilitates performing many tasks, and in dangerous jobs it eliminates the risk of damage to health or even to loss of life.
- Most threatened by automation and computerization are occupations based mainly on routine tasks; the experts interviewed pointed to workers in the financial sector (including banking), administrative workers, engineers performing simple tasks, and drivers.
- Those who will not need to worry about jobs in the future are the graduates of social science and humanities faculties because tasks and occupations based on abstract and creative thinking and requiring developed interpersonal skills will be the least automated.
- Progress in automation of work is possible but with high expenditures; most often it is done by large corporations operating on international markets.
- The appearance of international companies with enormous capital can, paradoxically, lead to gradual displacement of employees and to implementing technology to perform work instead of human workers.
- Governments are not taking meaningful actions aimed at preparing a socio-economic policy for the effects of technological progress and its impact on the functioning of society and state.
- Labour law will need many changes in order to adapt it to the new reality.
- Immigrants working in the CEE countries now can expect to remain employed in the coming years – they perform tasks that are not greatly threatened by automation and robotization.
- Technological underdevelopment of CEE countries and their deteriorating situation due to negative demographic changes may lower their attractiveness to migrants.
- Rising technological unemployment and high labour mobility may result in new challenges for social security as well as for public finance.
- Predicted increase in technological unemployment will force labour market institutions to adapt to the new situation; changes in labour law are particularly necessary.

- There will be even faster development of higher education institutions in the future, also training institutions, especially in terms of digital competences development.
- Experts forecast unanimously that in the future we will observe further interest in migration and labour mobility. Continuing technological progress may become a new challenge with regard to integration in host countries.

# Summary

The preparation of the fourth migration report coincided with certain significant processes which impacted the migration discourse in the EU. For more than ten months, debates have taken place on Brexit and on the question of retaining the rights of immigrants in the United Kingdom. Thousands of people constantly try to get into Europe in search of international protection. At the same time, the ongoing depopulation in EU Member States brings about an increasing demand for foreign labour as well as intensification of solutions for recruiting immigrants. Migration issues never leave the political agenda of EU institutions or of particular Member States. This is confirmed by statistics as well as by results of public opinion surveys. From both of them, it appears that in the coming years immigration will become the number one topic.

In the EU countries, new challenges faced by the labour markets are being increasingly discussed. Processes of automation and robotization of work, until now characteristic of labour markets in the USA, are becoming increasingly noticeable in EU countries. Both, statistics and the results of research carried out for this report, show that expected consequences of the processes under discussion are not unambiguous. On one hand, those changes lead to facilitating work, to speeding up tasks and works and to enhancing their effectiveness. Whilst on the other hand, they can lead to further changes in the way work is structured and consequently to displacing human workers and to a rise in technological unemployment.

In the report, two phenomena have been brought together; those which will shape to the highest degree the labour markets in the 21<sup>st</sup> century, namely migration and automation of work. Technological and civilisational changes increasingly affect destinations and duration as well as forms of migration. New forms of labour migration emerge. Permanent migration gives way to mobility which becomes an integral element of the work of many professionals, experts and managers. The role of technological progress is increasing as well as changes in the way the work is provided. Access to the Internet makes it possible to work in many industries in any place on earth at will. This is an extremely interesting area for research, which hasn't been described sufficiently yet, either in European or world literature on the subject.

As interviews with experts of different backgrounds has shown, access to new technologies influences migration decisions and makes reaching the desired country easier. More and more often, immigrants arriving in EU countries are highly qualified persons, with digital competence enabling them to function in the 4.0 economy. Because of low costs of tasks usually performed by immigrants, it still does not pay to automate their jobs and replace them by robots, as implementation of new technologies is much more expensive.

That is why, as the interviewed experts noted, demand for immigrant labour will be on the rise. The CEE countries may be facing a new challenge. The migration potential of countries like Ukraine, Russia and Belarus will run out. For those countries a decline in the working-age population is also predicted.

The level of demand for immigrants is related primarily to ongoing demographic processes that lead to a serious deficit in the labour force. The conversations with specialists confirmed that the challenges connected with population ageing and depopulation with their consequences pose the greatest threat to the correct functioning of labour markets in CEE countries. Paradoxically, the processes of automating tasks that allegedly would lead to taking away (some refer to it as "stealing") jobs from people may provide part of the solution for problems of the labour deficit in some sectors. The changes connected with "modernization" of work as well as with the forms in which it is structured and performed will proceed in an evolutionary rather than a revolutionary way.

In English-speaking countries however, an attitude in the current debate prevails that leads to scaring people with robots and artificial intelligence. In CEE countries, where the costs of labour are many times lower, processes of automation are no risk to workers with low qualifications or to the highly qualified ones.

Already today, we can assume that processes of automation and robotization will be posing challenges to the functioning of the social security system and to the public finance sector. The greatest problem will be in adapting the regulations of labour legislation and regulations concerning running an enterprise to the character of work performed in the age of the fourth technological revolution. All participants of the social dialogue should be equally engaged in developing those regulations. The responsibility for changes suggested is crucially important; implemented in an uncontrolled or improper way they could lead to an imbalance of the socio-economic order.

The CEE countries region should invest in sustainable development and increase expenditures for research and development. Those countries have great potential, especially with regard to human capital. Workers from CEE countries are still valued on labour markets all over Europe. Their civilizational and economic backwardness is caused by lack of decisive action and reforms responding to global challenges. This may lead to increased danger of technological unemployment and to low attractiveness for migrants.

The statistical data referred to, the analyses concerning future labour markets as well as the author's own research give rise to further questions. The situation of immigrants who will have no chance to find their way in the 4.0 economies is of special interest. Further changes on the world map of migrations will probably be observed; however, intensification of social and economic processes together with general uncertainty of the age we live in makes predicting both the scale and directions of the flows impossible.

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