

The spatial distribution of economic immigrants from Ukraine and Belarus and the socio-economic development of Polish counties¹

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Abstract

Following its accession to the EU and the progressing relaxation of the legislation on employment of foreign workers, Poland started to attract more and more job seekers from other countries, mainly from Ukraine, who saw opportunities in its expanding labour market, increasing demand for workers, falling unemployment and rising wages. The inflow of workers from countries east of Poland has benefitted its economy in many ways, including the narrowing of the demographic gap and increased funding for the national budget and the Social Insurance Institution (ZUS).

This study was undertaken to determine the types of factors causing Ukrainian and Belarusian nationals seeking employment in Poland to prefer one Polish county over the others and to assess their role. Based on the review of studies on the key determinants of migration, and given the limited availability of data, three major groups of factors that can be associated with their choices were selected for analysis – the distance between the migrant's home and Polish counties, their socio-economic status, and the presence of migration diasporas.

The analysis was performed by means of the widely used gravity models that describe population movements as a function of a geographical distance, and a taxonomic measure of counties' socio-economic development.

The main sources of data used in the article were Statistics Poland (www.stat.gov.pl) and Ministry of Family and Social Policy (<https://psz.praca.gov.pl/web/urzed-pracy>) and Educational Information System (<https://dane.gov.pl/pl/dataset/1426,liczba-uczniow-cudzoziemcow-wedug-gmin/>).

Keywords: brak

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Introduction

The level of unemployment in Poland has declined in the past dozen or so years, contributing to a greater availability of jobs and steadily rising wages. At the same time, because of the ageing of the country's population and shrinking labour force, Poland eased its immigration policies to make up for labour shortages.

Consequently, the number of economic immigrants from the former USSR countries has been rising in Poland at a fast rate in the last several years. The growing demand for labour, especially from the manufacturing and building industries, caused the government to amend the regulations on immigrants' access to the Polish labour market (Kałuża-Kopias 2016, 2018). The largest groups of foreign job-seekers in Poland are Ukrainians and Belarusians, with the latter only accounting for one-tenth of the former (Augustyńczyk 2019, Kruhlaya and Molenda 2021, Brzózka and Sowa 2016, Górny and Śleszyński 2019, Górny et al. 2018, Górny et al. 2019, Górny, Madej and Porwit 2020, Chmielewska, Dobroczyk and Panuciak 2018; Kałuża-Kopias 2021, Szpakowska, Buchwald and Romanowski 2016, Wendt, Lewandowska and Wiskulski 2018).

As well as influencing the size and structure of human resources in Poland, economic immigrants also stimulate regional labour markets and the demand for goods and services, etc. As a result, they indirectly contribute to the development of Polish regions (Strzelecki 2020, Pielach 2019).

As Polish regions differ in the level of socio-economic development (measured by GDP growth, increases in average wages, the availability of employment, the living cost-to-income ratio), the numbers of foreign workers they receive are also different.

The preferred destinations are Mazowieckie, Dolnośląskie and Małopolskie voivodeships³, where wages exceed the national average, and within the voivodeships, the biggest cities are especially attractive to foreign workers (Wrocław, Wałbrzych and Legnica in Dolnośląskie; Krakow and Tarnów in Małopolska, and the Warsaw metropolitan area in Mazowieckie). Other large Polish cities attracting economic immigrants are Łódź, Poznań, Lublin, Szczecin, the Tri-city (Gdynia, Gdańsk, Sopot), Białystok, and Katowice (Górny et. al 2018, Kłopot and Trojanowski 2018, Kałuża-Kopias 2021).

When choosing a destination for migration, prospective migrants compare countries in respect of their economic development, employment opportunities, achievable wages, living costs, etc (Boichuk, 2018). The economic aspects are important because of their effect on migrants' financial well-being in the long term, but they are not the only ones that are considered: migrants also take account of the distance they will have to travel to reach a county (Kałuża-Kopias 2021) and the presence of a local migration diaspora (Kindler and Wójcikowska-Baniak 2018, Górny et., 2007). The different sizes of Ukrainian and Belarusian migration diasporas in Polish counties largely

explain why some of them are more likely than others to have migrants. Although important, migration networks are not a decisive factor, because their appeal depends on the geographical distance to a county and related travel costs.

Three research hypotheses are tested in the study:

H1: The main reason why Polish counties receive different inflows of economic migrants from Ukraine and Belarus is variations in their socio-economic development.

Migration is one of the phenomena that are determined by socio-economic circumstances (Górny et al. 2019, Klimek 2015, Kulesa and Kaźmierkiewicz 2020). Migration plans are made and carried out when the difference in the level of socio-economic development and living standards in the potential migrant's area of residence and a Polish county make migration an attractive option. Migrants gravitate to the best developed counties, i.e., those with the highest wages, the lowest unemployment rates and the greatest need for workers (Frege 2020).

H2: Migration diasporas in the counties contribute to an increased inflow of migrants.

Western studies have shown that the presence of a migration diaspora reduces the cost of migration while increasing its benefits (Pedersen et al., 2008; McKenzie and Rapoport, 2010, Grogger and Hanson 2011). A significant role of migration diasporas as a factor facilitating migration is also indicated by Polish studies (Górny et al., 2007, Report by the Centre For Eastern Studies⁴).

H3: There are spatial differences in the distribution of Belarusian and Ukrainian migrants in Poland.

Previous research (Kałuża-Kopias 2020a, Górny et al. 2018, Report by the Centre For Eastern Studies) has determined that Ukrainian migrants prefer counties in Central and Western Poland while most Belarusians seek opportunities in counties in Eastern Poland, usually those along the border with Belarus.

2. Factors of migration – a literature review

When creating his migration model “pull – push” (1966), Everett Lee assumed that every migration had three elements: migrants' place of residence, the destination, and intervening obstacles. Based on the model, Lee identified factors of influence on migrations decisions. He concluded that the first two elements involved the knowledge of advantages and disadvantages of both areas, while intervention obstacles related to the distance between them.

The decision of whether or not to migrate is also determined by personal factors, which may arise at any point of the human life cycle, especially between its phases.

⁴ Report by the Centre For Eastern Studies (OSW), *Białorusini o Polsce, Rosji i sobie, Analiza badania opinii publicznej przeprowadzonego na zlecenie, Ośrodka Studiów Wschodnich*

According to Lee, there are push factors that increase the probability of migration (poor living conditions, few and limited education and work opportunities, insufficient social infrastructure, the family situation, etc.) and pull factors attracting to a new destination (better living conditions, more work and education opportunities). Interestingly, the same factor can push migrants from regions that are underdeveloped socially and economically while pulling migrants and discouraging emigration in regions at a higher level of socio-economic development. The 'pull-push' concept of migration was criticised by some researchers for ignoring social, historical and political factors, etc., and the fact that the potential migrants cannot have the complete knowledge of the socio-economic conditions at a destination (Brzozowski 2011). In spite of the criticism, its straightforwardness has contributed to it still being used as a theoretical framework of migration studies.

Among the factors determining the choice of the migration destination, geographical proximity (expressed by travel distance, time and cost), the availability of migration networks (consisting of established emigrants, relatives or mixed marriages) and labour market factors (the level of wages and abundance of employment opportunities allowing a new job to be found soon after arrival) are indicated as important (Greenwood 2021). An extensive review of theoretical concepts explaining the mechanisms of economic migration can be found, *inter alia*, in the studies by Górny and Kaczmarczyk (2003), and Kaushik (2021).

Ernest Ravenstein observed as early as 1885 that migration flows decrease with the distance between the origin and destination. Ravenstein's migration laws inspired the creation of gravity models, which are today widely used in internal and external migration studies (Flowerdew and Salt 1979, Karemera et al. 2000, Lewer and Van den Berg 2008, Mitze and Reinkowski 2011, Poot et al. 2016). Among Polish researchers who have used the models to study internal migrations are Chojnicki et al. (2011), Gawryszewski (1974, 1981), Kałuża (2007) Kałuża-Kopias (2020b), Pietrzak and Wilk (2014), Sojkin (2017) and Wojciechowski (2004).

From the economic perspective, the main factor triggering migrations is different levels of wages and unemployment between countries (Alvarez and Royuela 2021), but the weight attached to these factors is not the same. While Keynesians economics points to unemployment as one of the factors causing people to migrate (as quoted in Górny and Kaczmarczyk 2003), a number of researchers (Beine, Bertoli and Moraga 2014, Greenwood 2021) argue that migration is primarily motivated by income disparities between countries. The economic explanation of migration has been criticised (De Haas 2010, O'Reilly 2016) as lacking solid evidence, as no mass migrations have been observed between the less developed countries and those at a higher level of economic development and paying higher wages.

When developing his cumulative causation theory to explain migration flows, Massey (1990) used migration networks in addition to economic variables. The importance of the networks for migrants considering a destination has also been underscored

in the works of authors such as Beine, Bertoli and Fernández-Huertas Moraga (2014), Fan (2005), Peeters (2012). According to Rephan and Vencatasawmy (2000), migration networks reduce the newcomers' costs of adapting to the new environment. In the new economic theory of migration, the neoclassical approach has been expanded to allow for the process of making a migration decision that the theory held is not a decision of an individual but is made by all household members. In addition to labour market circumstances, the theory also considers the role of social security and education opportunities, etc. (Brzozowski 2011, Batista and McKenzi 2021). Studies investigating why Ukrainians choose to seek employment in Poland (Kałuża-Kopias 2020a) have shown that they are less concerned with how far they will have to travel to find a job than workers from other countries of the former USSR (Belarusians, Russians, Moldavians, Armenians, or Georgians).

According to Polish authors, people living behind the Polish eastern border consider employment in Polish counties mainly because of unsatisfactory wages at home (Chmielewska, Dobroczek and Panuciak 2018, Augustyńczyk 2019). Similar conclusions have been reached by Ukrainian researchers (Yeleyko 2007, Yeleyko and Kravevska 2020). The factors that make Poland attractive for Ukrainian workers are low unemployment and jobs paying wages several times higher than in Ukraine (Chmielewska, Dobroczek and Puzynkiewicz 2016, Górny et al. 2019, Paszkowicz and Hrynenko 2019, Kałuża-Kopias 2020a, 2021).

The political situation in Ukraine after 2014 (mainly the military operations going on in the eastern parts of the country that have deprived the Ukrainian government of control over large industrialised territory) has also accelerated the pace of migration to Poland (Wendt, Lewandowska and Wiskulski 2018). The last presidential elections in Belarus (2020) significantly increased the role of politics as a migration push factor (the Centre for Eastern Studies report).

3. Immigrants in the Polish labour market

Following the gradual liberalisation of the economic migration rules, rising wage levels and falling unemployment making jobs easier to find, the numbers of foreign workers in Poland started to steadily increase.

The Polish legislation requires the citizens of non-EU countries and European Economic Area countries to obtain work permits to take up legal employment in Poland. This requirement does not apply to foreign nationals who have permits allowing them to reside in EU countries, the long-term residents from EU Member States in Poland, the holders of tolerated stay permits, refugees, graduates of senior secondary schools and tertiary schools, scientists, and the holders of the Pole's Card. A special simplified procedure has been established for Ukrainians, Belarussians, Russians, Moldavians,

Georgians and Armenians⁵, employer declarations of intent to employ a foreign national⁶. In 2014, the work permit procedure was simplified and fees were reduced for foreign workers wishing to continue employment. Four years later, on the 1st of January 2018, a new regulation was introduced, allowing seasonal foreign workers to be employed for a period of up to nine months in a year⁷. At the beginning of 2022, the work permit procedure was amended again: the validity period of employer declarations was extended from 6 to 24 months, employers were allowed to issue a new declaration as soon as the previous one expired, and foreign workers were released from having to present documents confirming their residence in Poland and a source of income. The amendment also annulled the previous requirement stating that foreign workers must seek a new work permit in cases when their employer changes its seat, place of residence, name, and the legal form of ownership; when the employing organisation or part thereof is taken over by another entity; when the workers' civil-law contracts of employment are replaced with regular employment contracts; when the title of their job is changed while their responsibilities remain the same, and when an extension of their working time is followed by a proportionate increase in pay.

Because employer declarations are only an expression of intent to employ a foreign worker, there is a discrepancy between the number of registered declarations and the number of foreigners who actually use them to work. Experts estimate that around one-fourth of declarations remain unused (Górny et al. 2018). The Supreme Audit Office of Poland (NIK, 2015) reported that of 1433 foreigners in the Podkarpackie voivodeship who entered Poland on the basis of employer declarations and work permits in 2014, only 199 (17%) took up employment. Chmielewska, Dobroczyk and Panuciak (2018) have demonstrated that some foreign workers do not see the employer who issued a declaration or, if they do, they also seek extra jobs in the grey labour market despite their legal status. The National Labour Inspectorate found that in 2017, 5,400 (17.7%) out of 46,000 foreign workers were employed illegally.

The numbers presented above are approximations, because neither researchers nor the labour inspection authorities have yet been able to present the true scale of legal and illegal employment of foreign workers in Poland. The main reason for this is the unavailability of accurate statistics on immigrants with employer declarations and immigrants with jobs in the grey labour market. The number of the latter is roughly estimated at between 100,000 and 200,000 (Fihel, Kaczmarczyk and Stefańska, 2012). It is also noteworthy that the data on immigrant employment in Poland are obtained using different methodologies, which makes them incomparable.

⁵ Act on foreigners of 12 December 2013 (Journal of Laws, 2013, item 1650)

⁶ Act on promotion of employment and labour market institutions of 20 April 2004 (Journal of Laws, 2008, item. 69).

⁷ Regulation by the Minister of Family, Labour and Social Policy of 8 December 2017 on the subclasses of the Polish Classification of Activities (PKD) **authorising** seasonal work permits for foreign workers (Journal of Laws, 2017, item 2348).

The analysis below focuses on two groups of foreign workers in Poland, one using work permits and the other employer declarations. According to the data in Table 1, most immigrants exercise the second option.

The numbers of work permits and employer declarations issued between 2015 and 2019 rose in all Polish voivodeships (table 1). However, in 2020, the numbers were smaller than in 2019 by 8.6% and 7.3%, respectively, due to the COVID-19 pandemic.

In 2019 and 2020, the last years in the sample, the numbers of work permits issued to foreign nationals decreased the most in the Łódzkie, Śląskie and Mazowieckie voivodeships, while in Lubelskie, Małopolskie, Podlaskie and Wielkopolskie their numbers increased. As regards employer declarations, the largest decreases in their numbers occurred in the Małopolskie, Śląskie and Świętokrzyskie voivodeships, whereas in Lubuskie, Podkarpackie, Warmińsko-Mazurskie and Wielkopolskie their numbers increased.

Most foreign workers employed in Poland arrive from Ukraine. In 2020, they accounted for more than 73% of work permits and 92% of employer declarations. In previous years, the rates were as high or even higher, namely 77% and 97% (2015), 81% and 94% (2017), and 73% and 94% (2019). The total number of work permits and employer declarations issued in 2020 exceeded 295,000 and 1.3m, respectively. The second largest but much smaller group of foreign workers in Poland is Belarusians, with 28,500 work permits and 78,900 declarations issued in 2020.

Poland's attractiveness to economic migrants from Ukraine and Belarus derives from factors such as:

- 1) language affinity that makes basic communication with natives possible after only several weeks of practice;
- 2) geographical proximity which, with the ever-expanding network of good quality roads and low-cost airlines flying to many cities in Ukraine, enables frequent contact with families at home;
- 3) the presence of migration networks that enable new migrants to reduce living expenses in the first months after arrival;
- 4) higher wages than at home;
- 5) the liberalisation of labour regulations that make the Polish labour more accessible to workers from some former USSR countries (Brunarska, Grotte, Lesińska 2012, Kałuża-Kopias 2021).

The proximity of the eastern regions of Poland might imply that they are the preferred destinations for most economic migrants from Ukraine and Belarus. The spatial distribution of jobseekers from these countries shows, however, that it is not necessarily so. Until 2019, the government data on foreign workers in Poland were only presented for the national and voivodeship levels; in 2019, information about foreign workers employed in counties only based on employer declarations also

Table 1.

Work permits and employer declarations issued to foreign workers in Poland by voivodeship, 2015–2020

Voivodeship	work permits				employer declarations			
	2015	2017	2019	2020	2015	2017	2019	2020
Dolnośląskie	3388	12284	23907	22069	73042	218652	186506	164445
Kujawsko-Pomorskie	3347	6504	37976	29206	29694	69115	67534	62052
Lubelskie	1615	5254	12987	15684	56039	85415	38916	35497
Lubuskie	2666	7452	16359	13823	34132	79766	69014	69433
Łódzkie	1305	19345	41993	41428	37686	146927	145924	139211
Małopolskie	6291	22162	37389	39386	46319	134500	100864	76605
Mazowieckie	32502	75271	86348	68228	316108	414761	321303	293924
Opolskie	1218	5798	11578	11353	14744	38060	85364	79002
Podkarpackie	936	3730	8551	6656	10109	18190	24031	22076
Podlaskie	643	2898	9796	12481	7062	19282	32666	36366
Pomorskie	4133	12480	30409	23431	25270	132016	128819	126007
Śląskie	2003	23160	39077	34469	34349	152605	168918	133591
Świętokrzyskie	603	3252	6166	4759	17108	39713	20824	15806
Warmińsko-Mazurskie	506	5228	10204	6674	3604	22790	28998	47775
Wielkopolskie	3608	21036	49069	50330	58628	182194	154273	158167
Zachodniopomorskie	1022	9772	22599	26519	18328	70478	66129	59642
Poland	65786	235626	444738	406496	782222	1824464	1640083	1519599

Source: created by the author based on data from Wortal Publicznych Służb Zatrudnienia <https://psz.praca.gov.pl/web/urzad-pracy>

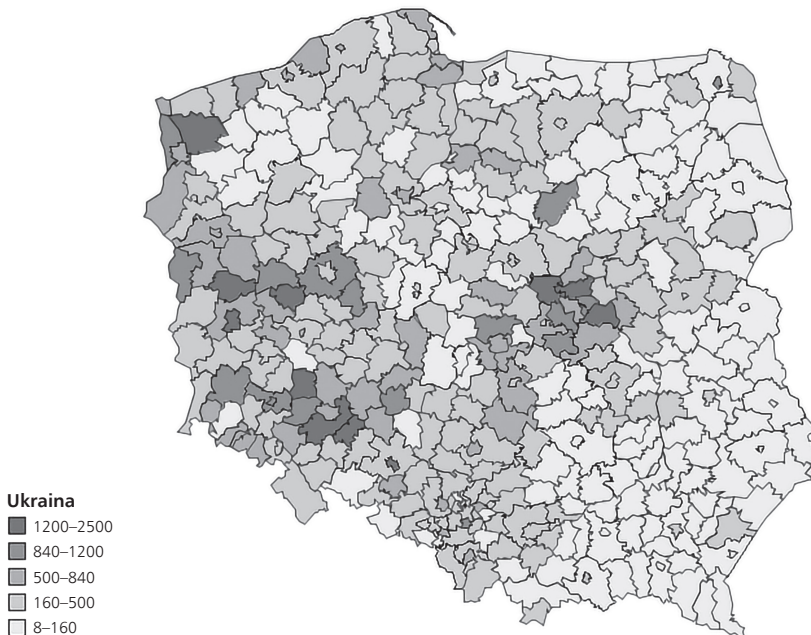
became available⁸. It made it possible to answer the question about whether and how many immigrants in Poland work temporary jobs in the biggest and economically strongest cities.

The spatial distributions of Ukrainian and Belarusian workers who represent the largest groups of economic immigrants in Poland are markedly different (Fig. 1 and Fig. 2). In 2019, most Ukrainians worked in the Mazowieckie and Dolnośląskie voivodeships. The highest numbers of employer declarations per 10,000 inhabitants were issued in the counties of Wrocław, Piaseczno and Sochaczew (2,426, 1,802, and 1,733, respectively) (Fig. 1).

Regarding Belarusian nationals, most of them worked in eastern Poland, tending to concentrate in the regions along the Polish-Belarusian border (Fig. 2). Their highest rates, exceeding 100 per 10,000 of population, occurred on the one hand, in the eastern regions in the urban counties of Białą Podlaska (159) and Białystok (125); and on the other hand in the western regions in the rural counties of Wrocław (105) and Sochaczew (104).

Figure 1.

Employer declarations registered for Ukrainian workers in 2019 by county of employment (per 10,000 of population)

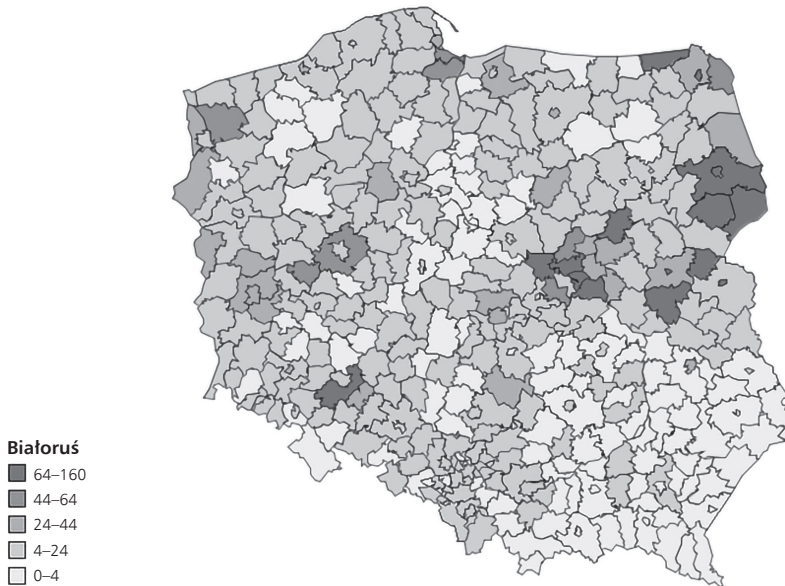


Source: created by the author based on data published by Wortal Publicznych Służb Zatrudnienia (<https://psz.praca.gov.pl/web/urzed-pracy>)

⁸ <https://www.gov.pl/web/rodzina/drp-cudzoziemcy-na-ryнку-pracy> (accessed: 20.10.2021)

Figure 2.

Employer declarations registered for Belarusian workers in 2019 by county of employment (per 10,000 of population)



Source: created by the author based on published by Wortal Publicznych Służb Zatrudnienia (<https://psz.praca.gov.pl/web/urzad-pracy>)

The spatial distribution of employer declarations held by Belarusians and Ukrainians in Poland raises the question about their preferred length of migration: Are shuttle migrations typically chosen by the former, while the latter tend to stay for longer periods? This question needs a representative study to be answered.

It is worth noting that the spatial distributions of Belarusian and Ukrainian workers in Poland were determined in this study based on registered employer declarations that involve short-term employment. Unfortunately, representative studies on the Belarusians are much fewer than studies on the Ukrainians. The Polish Office for Foreigners has estimated the number of Belarusians who successfully applied for permanent residence permits in 2021 at around 23,000. Most of them were granted them based on their Polish ancestry, with some having already been the holders of the Pole's Card. In the same year, almost 10,000 Belarusians received temporary residence permits; the majority (70%) sought them in relation to employment⁹. A 2019 CASE survey¹⁰ of Belarusian migrants in Poland found that the main reason for them to leave Belarus was not financial problems but political crisis and civil rights abuses.

⁹ <https://www.gov.pl/web/udsc/obywatele-bialorusi-w-polsce--raport> (accessed: 20.05.2022)

¹⁰ CASE – Center for Social and Economic Research, <https://www.case-research.eu/pl/publications> (Accessed: 20.05.2022)

As regards the Ukrainians, permanent residence permits were issued in 2021 to almost 88,000 applicants. Temporary residence permits were granted to 248,000 Ukrainians, among whom ca. 73% sought them based on their employment in Poland. Other most frequent reasons for seeking temporary residence permits included family matters (ca. 12%) and education (ca. 5%).¹

The presumption that most economic immigrants from Belarus and Ukraine would concentrate in the eastern regions of Poland was not confirmed for the Ukrainians. There are a number of factors that can explain this, such as the increasing accessibility of regions (in terms of travel time and cost) and regional differences regarding well-paying job offers and affordable accommodation. In 2019, the lowest levels of *per capita* GDP, below 42,000 PLN, were recorded in the Warmińsko-Mazurskie, Lubelskie and Podkarpackie voivodeships; in Wielkopolskie and Śląskie, the respective numbers were 64,000 PLN and 61,000 PLN. The leader was the Warsaw metropolitan area with a *per capita* GDP of more than 130,000 PLN².

The numbers explain why voivodeships in central and western Poland are considerably more appealing to foreign job seekers than the labour markets of eastern Poland, where wages are lower, and job offers are mediocre. A 2017 survey conducted by the National Bank of Poland (NBP) (Chmielewska et al. 2018) has revealed that the unsatisfactory level of wages at home is one of the main reasons for Ukrainians to seek employment in Poland.

For economic immigrants whose share of Poland's workforce steadily increases, the availability of migration networks is also important. They have a major influence on prospective migrants' decisions to seek employment abroad as a rich source of information about the pros and cons of destinations. The majority of migrants coming to Poland gravitate to regions where their relatives and acquaintances took up residence.

A role in the spatial distribution of foreign workers in Poland is also played by employment agencies. Out of the 8,199 agencies operating in 2018, the majority were based in the central and western regions of the country³, less than 20% in Mazowieckie, 11% in Wielkopolskie and Śląskie, and 8% in Dolnośląskie and Małopolskie. The rates for eastern voivodeships were much lower. Podlaskie, Warmińsko-Mazurskie and Lubelskie accounted for only 1.3%, 2.2% and 3.5% of employment agencies, respectively.

Lastly, local and regional policies as a factor for economic migrants choosing a destination need to be noted. Voivodeships, especially those affected by adverse demographic changes (population ageing, low fertility rates, and emigration), such as Łódzkie and Opolskie, increasingly develop policies aimed to encourage workers from Belarus and Ukraine to come, take legal jobs, and settle (Gońda 2021, Lesińska 2019).

¹ <https://www.gov.pl/web/udsc/obywatele-ukrainy-w-polsce--raport> (accessed: 20 May 2022)

² <https://stat.gov.pl/obszary-tematyczne/rachunki-narodowe/rachunki-regionalne/wstepne-szacunki-produktu-krajowego-brutto-w-przekroju-regionow-w-2019-roku,8,3.html> (Accessed: 20 Oct. 2021)

³ Wortal Publicznych Służb Zatrudnienia, <https://psz.praca.gov.pl/rynek-pracy/statystyki-i-analazy/zatrudnianie-cudzoziemcow-w-polsce> (accessed: 20 Oct. 2021)

4. Research method and data sources

The analysis was performed on employer declarations to hire a Belarusian or Ukrainian worker registered in 2019, i.e., the last year before the COVID-19 pandemic. The restrictions imposed in its wake, especially in the first months following its eruption, caused anxiety among Ukrainian workers over whether they would keep their jobs and be allowed to extend their stay, which contributed to their numbers dwindling in some parts of Poland.

The specific reason for selecting economic immigrants from Belarus and Ukraine as an object of analysis was their different spatial distributions in Poland confirmed by registered employer declarations. Unfortunately, for the lack of information on how many work permits were registered for Belarusian and Ukrainian workers in the counties, their holders had to be omitted from analysis (Kałuża-Kopias 2020a).

It is worth noting here that employer declarations are a more common basis of employment among foreign nationals who take their first jobs in Poland; Ukrainians and Belarusians who have worked in Poland for several years are employed under other arrangements, including work permits (Dąbrowski 2014).

The following analysis of Ukrainian and Belarussian migrants in Poland was performed by means of a widely used class of gravity models, which assume that the scale of migration decreases as migration distance increases (Greenwood 2021).

A gravity model can be written as a model (power function) (1):

$$M_{ij} = \beta D_{ij}^{\alpha}, \quad (1)$$

where:

M_{ij} – migration between areas i and j ;

α , β – the parameters to be estimated;

D_{ij} – the distance between areas i and j .

A power function is a very convenient solution, because its parameter α is interpreted in the same way as parameter α of the production function. Higher absolute values of parameter α indicate a limited range of migration streams (Mazurkiewicz, 1986).

In studies like this one, parameter β (the free term) is not interpreted because it is only a structural element of the power function (Pietrzak and Wilk 2014, Sojkin 2017, Wojciechowski 2004, Welfe 2003).

Variable D_{ij} can be interpreted in spatial-economic research as a physical distance (measured by kilometres or travel-time units) or an economic distance (representing the cost of moving one's home from one area to another).

The distance between a potential migrant's home and a destination is not decisive when migration is considered; it is rather perceived as an obstacle that needs to be overcome.

The scale of migration to a county depends not only on how far a migrant will have to travel, but also on the level of its socio-economic development, and the presence of a migration community.

Because socio-economic development is a complex phenomenon and decisions to migrate tend to consider a number of interrelated factors (such as the rate of unemployment, wages, the cost of living), at least several variables are necessary to describe it.

To account for this, model (1) was extended by introducing variables representing counties' socio-economic characteristics (variables a–d) and migration communities therein (variables A and B):

- a) the average gross wage in a county (a measure of its attractiveness for a migrant worker),
- b) the rate of unemployment in a county (%) (an indicator of availability of jobs),
- c) the number of employment agencies in a county (an indicator of the availability of placement services to migrant workers),
- d) the average *per capita* revenue of municipalities comprising a county (PLN) (representing the level of its wealth and thus the standard of living).

There are also other ways to measure and evaluate the level of the socio-economic development of an administrative unit. The selection of variables in this study was not supported by any universal formula; it was simply dictated by the availability of data and conclusions from the review of migration studies.

As mentioned before, migration decisions and the patterns of migration flows also depend on the availability of migration networks, which are defined as interpersonal relationships between longer-established and potential migrants. Such relationships make it easier for the latter to find employment and accommodation soon after arrival and to reduce the economic and mental costs as well as the risks of living abroad (Stark 2013, Haug 2008). In this study, migration communities are meant as equivalent to immigrant communities in Poland.

In this study, the presence of migration communities are described by means of the following variables:

- A) the total number of Ukrainian and Belarusian migrants permanently living in each county between 2016 and 2018 (a factor facilitating newcomers to accommodate to a new life during the first weeks after arrival).
- B) the number of Ukrainian and Belarusian pupils in elementary and secondary schools in a county (2018) (an indicator of its attractiveness for long-term migrants).

The direct aggregation of the socio-economic and migration community variables adopted in the study is not possible as they are expressed in different units. Therefore, they were normalised using procedures (2) for stimulants and (3) for destimulants.

$$z_{ij} = \frac{x_{ij}}{\max x_{ij}} \quad (2)$$

$$z_{ij} = \frac{\min x_{ij}}{x_{ij}} \quad (3)$$

where:

x_{ij} – the value of the j -th variable for the i -th object.

All 6 variables, i.e., stimulant variables a , c , d , A , and B , and a destimulant variable b , were used after normalization to construct a taxonomic measure of counties' socio-economic development and the sizes of the Ukrainian and Belarusian migration communities in the counties using a standardised sum method, which is written as:

$$S_j(N_j) = \frac{\sum_{j=1}^m z_{ij}}{m} \quad (4)$$

where:

z_{ij} – the normalised values of variables $i=1, \dots, n$, $j=1, \dots, m$

m – the number of variables.

Measure $S_j(N_j)$ takes values in the range from 0 to 1. Values closer to 1 mean a higher level of socio-economic development in relative terms, while values closer to 0 indicate its lower level.

The taxonomic measures representing the levels of socio-economic development and the sizes of migration communities in the counties were included in the model (power function) (1).

$$M_{ij} = \beta D_{ij}^{\alpha} S_{ij}^{\alpha} N_{ij}^{\alpha} \quad (5)$$

where:

M_{ij} – economic immigration (the number of registered employer declarations) from

Ukraine and Belarus to counties calculated as $\frac{M_{ij}}{P_j} 10^5$, where M_{ij} is the number of workers employed based on employer declarations in county j , and P_j denotes the average number of residents in county j ;

D_{ij} – the distance between i and j defined as above; represents a physical distance calculated as the arithmetic average road distance (km) between the major border crossings between Poland and Belarus and Poland or Poland and Ukraine⁴ and the capital towns of Polish counties. The distances that economic migrants have to travel within their countries to reach the Polish border were omitted due to the lack of available data.

⁴ For Belarus: Bobrowniki, Kukuryki, Kuźnica Białostocka, and Terespol; for Ukraine: Dorohusk, Hrebne, Hrubieszów, Korczowa, Medyka, and Przemyśl.

S_j – the taxonomic measure of socio-economic development of a county;
 N_j – the taxonomic measure of the size of a migration community in a county.
 $\beta, \alpha_1, \alpha_2, \alpha_3$ – the parameters to be estimated;

After allowing for the cumulated effect of distance, the level of socio-economic development in a county and the size of a local migration diaspora on economic migration from Ukraine and Belarus to Poland, and after transforming model (5) into a logarithmic function, function (6) was obtained, which was more convenient to use in further calculations:

$$\ln M_{ij} = \ln \alpha_0 + \alpha_1 \ln D_{ij} + \alpha_2 \ln S_j + \alpha_3 \ln N_j \quad (6)$$

Parameters α_i of function (6) were estimated using the Ordinary Least Squares Method (OLS).

The main sources of data used in the article were Statistics Poland (www.stat.gov.pl) and the Ministry of Family and Social Policy (<https://psz.praca.gov.pl/web/urzad-pracy>) and the Educational Information System (<https://dane.gov.pl/pl/dataset/1426,liczba-uczniow-cudzoziemcow-wedug-gmin/>).

The sample analysed included all Polish counties (i.e., 314 ‘regular’ counties and 66 towns with county status). Because of a large number of observations, the few counties on which data were not available were omitted from analysis.

5. Results and discussion

The data in Table 2 provide some insight into how the selected variables influence economic migration to Poland. All estimates of the Belarusian and Ukrainian migration models’ parameters proved statistically significant, but the values of R^2 (the coefficient of determination) estimated for both models show a poorer fit to empirical data in the former. A plausible explanation of why R^2 values obtained with both models are low are that only Ukrainians and Belarusians employed on the grounds of employer declarations were considered in the study. Whether foreign workers extending their stay (beyond 2 or 3 years) still use employer declarations as a basis of employment was impossible to establish. Let us also note that employers register their declarations in the county where the head office is based, which may be different than that where an immigrant will live and work.

It is also noteworthy that migration is a complex phenomenon influenced by many factors. It is, therefore, not possible to a construct a model capable of accounting for all of them, particularly given that some factors are non-measurable (e.g., migrants’ individual preferences).

Tab. 2

Parameter estimates for the Belarusian and Ukrainian migration models⁵

Variable	Belarusian model		Ukrainian model	
	parameter α_i	p-value	parameter α_i	p-value
the free term	5.623	0.000	2.165	0.000
D_{ij}	-0.626	0.000	-0.596	0.000
S_j	1.156	0.001	0.511	0.034
N_j	0.236	0.000	0.235	0.000
coefficient of determination (R^2)	0.624	X	0.788	X
standard estimation error	0.132	X	0.112	X
N sample size	378		380	

Source: calculated by the author in Statistica software using data sourced from Wortal Publicznych Służb Zatrudnienia, Educational Information System (SIO) and Statistic Poland

The negative estimates of parameter α_1 mean that the rate of migrant inflow to destinations decreases with geographical distance. The estimates of the parameter also show that Ukrainian workers are less concerned with the distance they have to travel across Poland to find a job than their Belarusian counterparts.

Belarusian and Ukrainian job-seekers are attracted to counties where the socio-economic situation is relatively favourable. This factor proved to be more important for the former. The estimates of parameter α_2 indicate that a 1% improvement in the socio-economic situation in the county increases the rate of inflow of Belarusian workers by almost 1.2% and by only 0.5% in the case of the Ukrainians.

The estimates of parameter α_3 confirmed that the size of an immigrant community in a county determined the rate of inflow of economic immigrants from both Ukraine and Belarus and that the strength of this factor was similar in both cases.

Although geographical distance is indicated as a factor reducing the scale of migration flows, its discouraging effect appears to be weaker than the ability of favourable socio-economic conditions to attract migrants. It also needs to be noted that the financial, social and time costs of long-distance migrations gradually decline as the availability of inexpensive modes of transport and expanding road networks improves.

Economic migrations from Ukraine and Belarus to Poland are mainly driven by the countries' different levels of socio-economic development. How big the differences

⁵ In econometric science, parameters α_i of a model have the following interpretation: if the exogenous variable (x) increases by 1% while the other explanatory variables do not change, the endogenous variable (y) increase or decrease (the direction is shown by its sign: +/-) by an amount equal to the value of the estimated parameter α_i % (Welfe and Welfe 1996).

between them can be illustrated by the levels of wages. In 2020 in Poland, the average gross wage neared 5,200 PLN and the minimum gross wage was around 2,600 PLN; their Ukrainian and Belarusian equivalents (in Polish zlotys) were 1,900 and 570 and 1,300 and 560, respectively⁶. At the same time, after comparing the consumption basket costs in the three countries, OTTO Work Force⁷ Central Europe reported that the average prices of basic food products in their largest supermarket chains were comparable. This means that it takes almost two days' work in Ukraine, two-and-half days' work in Belarus, and only half a day's work in Poland to buy the same products. Polish wages and living costs seem to be attractive enough for Belarusians to seek employment in the labour markets on the Polish side of the border (their geographical proximity allowing frequent contact with friends and relatives at home is another advantage).

The results of this study pointing to economic advantages as the main factors pulling Belarusian and Ukrainian workers to Poland are confirmed by recent studies on economic migration from these countries (Górny et al. 2020, Zielińska and Szaban 2021, Kruhlaya and Molenda 2021).

In choosing a given Polish county, economic migrants from Belarus and Ukraine consider both geographical distance and a county's relative economic advantages. Counties that are farther away from Poland's eastern border and those known for low wages and high unemployment appear to be less popular destinations than the eastern counties and those with high demand for labour and high wages. The data on immigrant communities in Poland (Górny and Śleszyński 2019, Kałuża-Kopias 2020a) show that the most interesting of all destinations are metropolitan areas with the greatest demand for workers.

The spatial availability of migration communities as a factor influencing the directions and scale of international migrations (Taylor 1986, Fagiolo and Mastrorillo 2013) was also examined.

The expansion of migration communities, which is especially marked in the case of long-term economic immigrants from Ukraine, takes place through the integration of foreign nationals into local populations through bi-national marriages and a rising number of children born in the host country (Szukalski 2020). According to some researchers (Rephann and Vencatasawmy 2000), the availability of migration communities is more important for potential migrants than even the labour market conditions. This observation may also be true for both nationalities examined in this study.

⁶ Eurostat: Wages and labour costs https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Wages_and_labour_costs (Accessed: 28.07.2021)

⁷ <https://www.ottoworkforce.pl/ile-na-zycie-w-polsce-wydaja-ukraincy> (Accessed: 28.12.2021)

7. Conclusion

The liberalisation of rules governing the employment of foreign workers in Poland that has been going for several years now is a response to the rising demand for labour reported by voivodeships of key importance for the national economy and less developed regions such as Lubuskie and Podlaskie that consequently become popular destinations among economic immigrants. However, the numbers of Ukrainian and Belarusian workers are not equally distributed among Polish regions because of their different levels of economic development. The most attractive destinations are the economically best developed big cities and their suburbs.

Factors such as the presence of migration communities, the ease of reaching an area, and the policy of local authorities toward foreign workers also determine their spatial distribution in Poland.

The analysis has shown that the level of Poland's socio-economic development and the presence of migration communities attract economic migrants, while geographical distance has a discouraging effect. The estimates of parameter α suggest that Belarusian immigrants tend to pay more attention to the socio-economic conditions in the destination area than economic immigrants from Ukraine. This attitude probably arises from bigger social and economic differences between Poland and Belarus than between Poland and Ukraine. This matter should also be investigated more in-depth in the future.

The results of this study are consistent with the findings of qualitative studies according to which economic migrants choose Poland in search of economic benefits, better wages, lower living costs, etc. (Brzózka and Sowa 2016, Chmielewska, Dobroczyk and Panuciak 2018, Górny, Madej and Porwit 2020, OTTO Work Force Central Europe 2019⁸).

They also encourage more research on why economic immigrants seem to perceive some Polish regions as more attractive than others. Considering that more and more Ukrainian and Belarusian nationals choose to extend their stay in Poland, to bring in their families, or to marry a Polish citizen, quantitative studies should also examine more closely how migration communities and the spatial distribution of immigrants in Poland are related to each other.

The gravity model used in this study is a popular tool in international migration research. The importance of gravity models has significantly increased in the last decade with the expansion of migration databases. The availability of new data made it possible to provide the models with variables that had previously not been used in studies, e.g., migration communities (Charyyev and Gunes 2019, Danchev and Porter 2021) or language or cultural affinity between countries (Lanati and Venturini 2021).

Although gravity models have some limitations (e.g., a large number of null observations), their advantages (such as the ease of adding new variables or interpreting parameter estimates) still make them a useful tool for analysing the causes of migrations and seeking relationships between migrations and economic and social factors.

The data and indicators used in the study have some weaknesses. As mentioned earlier, the numbers of registered employer declarations do not represent the exact numbers of Belarussian and Ukrainian workers for many reasons. There are known cases of potential workers cancelling their arrival to Poland or being refused a visa, several declarations may be issued to the same worker, a worker may not show up at the employer who issued a declaration or take a job with another employer. There is also evidence that some Ukrainians sell employer declarations issued on their behalf to other foreigners. According to Matkowska (2012), employer declarations may also be illegitimately used by non-EU citizens to enter the Schengen area.

As it appears, employer declarations are typically sought by the less experienced migrants, who are early in the process of choosing migration destinations. Therefore, the fact that most of them find jobs through employment agencies and that economic migrants who are more established in Poland's labour market prefer other employment arrangements (e.g., work permits) (Dąbrowski 2014) can also contribute to differences between the spatial distribution of employer declarations and the numbers of workers from Belarus and Ukraine in Polish counties.

The way distance as a measure of migration was calculated in this study also has some limitations. As a database showing actual distances travelled by migrants has not yet been created, it was represented by the average distance between counties and selected border crossings.

As regards the indicators of counties' socio-economic development, their choice was dictated by the literature review findings and data availability.

The results of the study should be interpreted with caution. They are only based on the measurable determinants of migration decisions, whereas the size and directions of migration are also frequently influenced by intangible factors (psychological, cultural, legal, political, etc.). The comparisons of the living conditions and opportunities at home and abroad made by potential migrants are very subjective, and their knowledge of the destination is not always complete and up to date.

The problem of ageing of human resources and labour shortages that will likely intensify in the coming years has been addressed in the 2021–2027 European Social Development Fund, which provides for the possibility of using immigrants to mitigate labour shortages. In Poland today, foreign workers account for around 5% of the country's workforce. This rate should be increased, mainly by enlarging the share of workers from countries such as Belarus and Ukraine if the economic growth of Poland is to continue. As indicated by Strzelecki, Growiec and Wyszyński (2021), the Polish economy has been growing faster by 0.5 percentage points per year since 2014 thanks to the citizens of the former USSR.

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