Factors affecting migration destination choices of international migrant workers in Slovakia

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Abstract: *The main goal of this paper is to determine the main economic factors that influence the self-selection process of migrant workers when settling in Slovakia. Considering the growing number of migrant workers in Slovakia, it is necessary to determine which factors influence them most when choosing a final destination within the country. Paper deals with the allocation of migrant workers in Slovakia focusing on the mutual relationship between the total number of migrant workers and the average wage, and the number of vacancies in 2010 and 2020 in individual districts. The paper also analyses the domestic labour market with emphasis on internal and foreign labour migration. The study is based on migration and self-selection process theories. In the paper, we work with data from public institutions in Slovakia, especially the Ministry of Labour, Social Affairs and Family, the National Bank of Slovakia and the Statistical Office. To achieve the goal, Spearman's coefficient is used and its significance and linear regression are tested. The results show that the correlation between the number of migrant workers in individual districts and the number of vacancies was stronger than the correlation between the number of migrant workers and the amount of average wage in both monitored years 2010 and 2020.*

Keywords: *labour migration, labour market, migrant workers, wage, vacancies, Slovakia*

Introduction

International migration can be considered one of the major social, economic, political and cultural challenges of the 21st century. In 2021 we recorded more than 270 million migrants worldwide and their total number will continue to grow (National Intelligence Council 2021). Whereas in the past, migration research has largely been limited to identifying motives that lead to migration, current approaches analyse migration in a broader sense and focus on migration itself, as well as the process that precedes it and its consequences upon arrival at the receiving destination.

Slovakia has recorded changes in migration trends over the last decade. The total number of migrant workers has increased significantly. For the purposes of this article we consider migrant workers to be in the following categories: third-country nationals with a work permit in Slovakia, EU/EEA nationals with an information card in Slovakia, and third-country nationals with an information card (without a work permit). An increase in the total number of migrant workers is just one of many other aspects that migration entails. It also contributed structural changes in the domestic labour market. The allocation of migrant workers in Slovakia shows that migrant workers are settled mainly in the west of the country in or close to cities with a high concentration of industrial production. However, there is lack of study in domestic literature that would deal with the influence of individual economic factors on the allocation of migrant workers in Slovakia. In view of the above, we examine the correlation of two chosen variables, the number of job vacancies and the amount of the average wage, on the number of migrant workers in individual districts of Slovakia.

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The paper contains an overview of theoretical approaches to labour migration and the process of self-selection of migrant workers. The knowledge from Slovak literature will be confronted and enriched with foreign, including Czech studies. The theoretical part is followed by a description of the national labour market with emphasis placed on internal migration and a detailed analysis of labour immigration in individual districts of Slovakia with identification of the relationship between average wages and vacancies.

Theoretical approaches examining migration factors

Many theoretical approaches try to explain the process of deciding on migration and the subsequent choice of destination. For the needs of this paper, we will emphasize only some of them.

The neoclassical theory of migration is based on the assumption that the central motive for migration is the wage gap in the sending and receiving countries. Migration is influenced only by the conditions on the labour market and is barely affected by markets of other factors of production. Kurekova (2011) states that the neoclassical theory viewed as mechanically reducing migration determinants, ignoring market imperfections, homogenizing migrants and migrant societies, is ahistorical and static. It also does not sufficiently explain the differing behaviours of highly and low-skilled workers, which reflects the theory of human capital (Chrančoková, Smrčková 2015, Arango 2000). Based on this theory, highly qualified migrants choose destinations where they may best utilize their education, and low-skilled migrants take into account, in particular, the existing demand for labour (Kurekova 2011).

The dual labour market theory is based on the belief that migration itself is affected by pull factors, favourable conditions that are present in the receiving destination, and not push factors, unfavourable conditions in the sending country (Piore 1979). The main reason for migration is therefore the demand for labour in economically developed countries (Piore 1979). The theory draws attention to disparities between the requirements of employers and the structure of the unemployed in the host country. This theory describes the interrelationship between foreign workers operating in domestic labour markets and the problems of regional structural unemployment, while other theories do not address the existence of this connection (Arango 2000). The massive immigration of workers to economically developed countries, as described by the dual labour market theory, may result in an increase in income inequality between high and low income layers of the population (Kalmanová 2008). Wage disparities between the domestic population and migrant workers can cause the extinction of the middle class and significantly widen the economic disparities between them (Kalmanová 2008). The International Labour Organization (2020) claims that the wage gap between migrants and the domestic population is increasing. On average, the difference in remuneration between these two groups is 13 p.p. The average of the European Union is 9 p.p., a negative trend is the fact that the difference in remuneration of the domestic population and migrants is widening even in countries with high incomes (for example Italy or Austria). The result of the aforementioned is that the middle class in the economy is disappearing and the differences between the low and high income part of the population are deepening even more (The International Labour Organization 2020). Current migration flows cannot be explained solely through the application of a single migration theory and point to the need for a combination of several approaches. Liďák and Srb (2019) state that family background and the establishment of social security in recipient countries act as some of the main motives for migration. The first waves of migrants improve and accelerate the process of integrating migrants from the same background who decided to immigrate later.

The theory of social networks is followed by the theory of migration systems. It assumes that current migration flows are the result of the existence of not only social but also cultural,

historical and technological ties (Drbohlav and Uherek 2007). The importance of historical and cultural ties, which significantly affect migration, has been clearly shown in the migration of citizens from Ukraine to Slovakia. The cultural similarity of Ukraine and eastern Slovakia caused up to two thirds of migrants from Ukraine to settle in eastern Slovakia (Koroutchev and Novotný 2020) in comparison to the long-term trend of migration in Slovakia in settling in economically developed districts in the west of the country. The theory of migration systems explains the different ethnic composition of migrants in the countries of Western and Central Europe. While countries in Western Europe are recipients of immigrants from their former colonies, so-called new Member States of the European Union (with accession after 2004) face immigration, especially from countries with a related cultural and language environment (Serbia and Ukraine).

Drbohlav and Uherek (2007) propose examining migration from the perspective of three dimensions, each of which examines the aforementioned phenomenon from a different aspect. According to them, the first dimension examined should be the administrative definition of migration, which means determining the area in which migration actually takes place. The second dimension examined is the decision made on the actual object of migration; the difference being mainly on whether the micro or macro approach is applied. The third and final dimension of migration is its developmental aspect, which takes into account the development level of society and then takes into account the migration phase itself (pre-migration phase, migration phase, post-migration phase). The above-mentioned theories of migration provided a general basis for the study of migration with emphasis placed on examining the main factors that lead to migration. The specific issue of the migrant's final decision to emigrate and settle in a selected region in the host country has become the subject of more recent research by several authors who have sought to determine the main factors that influence the migrant's decision making. Migration at the national and international levels can be considered a self-selection process which is influenced by economic, social or cultural factors. Most authors agree that the level of wages offered is key, although not the only factor that affects migrants' decision to settle (Kennan and Walker 2011). However, selected contemporary authors still point to the dual labour market theory, which, while insufficient in many aspects, provides a suitable justification for labour immigration to economically developed countries (Rye and Slettebak 2020). Geis, Uebelmesser and Werding (2008) point out that abstracting from other migration factors and limiting them exclusively to the pay gap in the selected region is incorrect and does not provide relevant conclusions. The authors claim that if the labour market becomes oversaturated, social networks lose their importance (Geis, Uebelmesser and Werding 2008). They also determine other factors that ultimately influence migrants' choice of destination, such as institutional background, the overall percentage of foreigners in the domestic population, infant mortality, pension benefits, and unemployment benefits (Geis, Uebelmesser and Werding 2008). However, the authors emphasize that the impact of these variables varies depending on whether about it is in regard to high-skilled or low-skilled migrants. Belot and Hatton (2019) partially agree with the conclusions of the theory of migration systems and argue that established colonial links and linguistic and cultural proximity have a positive effect on destination selection, even considering the existence of colonial ties as being more important than cultural and linguistic proximity, while other authors come to the opposite conclusion (Liďák and Srb 2019). Dorn and Zweimüller (2021) state that social networks have a greater influence on the decision-making of migrants from third countries than from the Member States of the European Union. Citizens of the European Union take into account predominantly economic factors, such as wage rates or labour demand, when choosing a target region.

As in the case of international migration, also within the national type, crucial factors that affect migration are economic conditions in the form of wages and the demand for work. Gazda and Novotný (2014) state that in Slovakia economic factors such as the level of average wage and the unemployment rate (respectively the number of vacancies) have the main impact on internal migration and even greater than on other demographic indicators. Michálek and Podolák (2011) examined the impact of the average wage and registered unemployment rate in selected districts in 2004 and 2007 and confirmed that districts that showed positive economic parameters, i.e. a high level of average wage and a low unemployment rate, recorded positive trends in the migration balance. Conversely, districts with higher unemployment rate parameters recorded a migration decline.

The process of self-selection of final destination is also influenced by different social factors. Based on theoretical studies, residents of districts of Slovakia which have historically had more experience with immigration tend to perceive the benefits of international migration more positively in comparison to inhabitants of regions in which experience with immigration is absent. This statement was confirmed by the results of an empirical survey, the main aim of which was to determine the perception of international labour immigration by Slovak citizens (Vašečka 2009, pp. 61-70). The results showed that labour migration has been perceived more positively by inhabitants of Bratislava self-governing region and Trnava self-governing region.

Based on the above theoretical premises, we established the following hypotheses for our research: The number of migrant workers in individual districts is significantly related to the level of average wage in these districts. The number of migrant workers in individual districts is significantly related to the number of vacancies in these districts.

Methodology

The article analyses labour immigration in Slovakia with emphasis placed on the regional allocation of migrant workers in individual districts. Quantitative data on migrant workers was drawn from official statistics of the Central Office of Labour, Social Affairs and Family (2004, 2006, 2010b, 2019, 2020b). The total numbers of migrant workers include the following groups of persons: third-country nationals with a work permit in Slovakia, EU/EEA nationals with an information card in Slovakia and third-country nationals with an information card (without a work permit). We removed persons with non-Slovak citizenship who are self-employed due to different motivations they may have had when entering the labour market compared to employees. We divided all migrant workers in Slovakia into individual districts.

The analysis consists of determining the correlation between the total number of migrant workers and the average wage, respectively the number of job vacancies in 2010 and 2020 in individual districts. The paper also includes the total number of migrant workers in Slovakia prior to 2010 but, due to the low values of migrant workers in individual districts, we approach the comparative analysis only for the years 2010 and 2020. In Slovakia, due to the absence of historical experience with labour immigration, there is a lack of studies that would deal with the process of self-selection of migrant workers and an analysis of factors that influence them to enter Slovakia. Current authors agree that it is impossible to limit factors that lead to migration exclusively to economic or social ones. Due to the fact that social conditions become crucial for decisions on migration, especially in larger waves of migration (for example, the western countries of the EU), in this paper we will proceed to analyse the economic factors influencing migrant workers. Geis, Uebelmesser and Werding (2008) state that also other economic conditions, not only the wage offered, influence the final decision of migrant workers. Rye and Slettebak (2020) claim that the demand for labour forces plays a key role

in migrants´ decisions. In view of the above, we take into account the conclusions of both studies. Based on the distribution of migrant workers to individual districts, we will examine the mutual relationship between this variable and the amount of the average wage and the number of vacancies.

To determine mutual influence of the variable amount of the average wage and the number of vacancies in individual districts on the total number of migrant workers, we used the Spearman coefficient and test its significance. The Spearman coefficient is a non-parametric rank correlation measure. While most researchers agree that a coefficient of <0.1 indicates a negligible and >0.9 a very strong relationship, values in-between are disputable. For interpretation of correlation coefficient, we will proceed with the conclusions of Hinkle et al. (1998.) They interpret the values of the correlation coefficient as follows: 0.90 to 1.00 (-0.90 to -1.00) very high correlation; 0.70 to 0.90 (-0.70 to -0.90) high correlation; 0.50 to 0.70 (-0.50 to -0.70) medium correlation; 0.30 to 0.50 (-0.30 to -0.50) low correlation; 0.00 to 0.30 (0.00 to -0.30) very low or no correlation.

The statistics of migrant workers in individual districts include foreign nationals who work in the given districts, i.e. they are allocated to districts based on place of work, not place of residence. The average wage in individual districts is calculated from jobs that are performed in the territory of individual districts. Data on the number of vacancies are given based on their distribution by individual district, as reported by the Central Office of Labour, Social Affairs and Family.

We also used linear regression to verify the combined effect of two variables on the third parameter. From these data, we determined an equation for estimating the number of migrant workers. The first model (2010) shows that the factors indicated explain about 50% of the variability, the second model (2020) about 86% of the variability. If the value of the adjusted square was 100%, the real data of migrant workers, the amount of the average wage and the number of vacancies would correspond exactly to the value based on the equation. However, based on the performed analysis, it can be stated that in the second model there is a high variability above 80%, i.e. when substituting individual values we get data closer to real data than in comparison with data for 2010.

The research period is between the years 2010 and 2020. In view of the above, we excluded migratory waves caused by the war in Ukraine, which has significantly changed the qualitative parameters of incoming migrants.

Of the state authorities, most transparent data is provided by the Ministry of Labour, Social Affairs and Family which provides a monthly overview of the employment of foreigners on our territory, according to quantitative and qualitative parameters such as age, occupied position and also their geographical allocation to individual districts. Statistics from other state institutions cannot be considered sufficient and severely limit research opportunities.

Domestic labour market

The domestic labour market has undergone dynamic development since the establishment of an independent state in 1993. It struggled with a high unemployment rate, which achieved its historically lowest level in 2019 (4.92 %). If we look at the development of this indicator, we see that, for example, in 1994, compared to the Czech Republic (3.2%), the unemployment rate in Slovakia (14.8%) was almost four times higher (National bank of Slovakia 1994). The fundamental difference in registered unemployment rate can be explained mainly by the slowdown and subsequent decline of selected industries in Slovakia and the need to restructure the economy. Slovakia's accession to the European Union did not significantly decrease the unemployment rate. The unemployment rate was 11.6% in 2005, while in 2010 it stabilized at 12.5% (Ministry of Labour, Social Affairs and Family 2013); its increase was caused mainly

by the global financial crisis. From the point of view of economic development in Slovakia, the past decade can be assessed positively, which was also reflected in the obvious decline in the unemployment rate. In 2019, for the first time in the existence of an independent Slovakia, the registered unemployment rate fell below 5%. The consequences of the crisis caused by the pandemic had a negative effect, and in December 2020 Slovakia registered a 6.64% unemployment rate (Central Office of Labour, Social Affairs and Family 2020a).

In a detailed analysis, we find that a separate unemployment rate, when abstracted from other measurable indicators, does not provide a sufficient picture of the labour market. Regional differences in unemployment in Slovakia are among the absolute highest in the European Union. We recorded the long-term high unemployment rate in a group of the twenty least developed districts, which all lie in Košice, Prešov and Banská Bystrica self-governing region (see Fig. 2 or 3). Most of these districts are so-called end districts, which means that they lie on or close to a border. The highest unemployment rate was recorded in Rimavská Sobota district at 20.26 % (Central Office of Labour, Social Affairs and Family 2020a). For comparison, the lowest unemployment rate in the observed period was recorded in district Bratislava 5 with a value of 3.68% (Central Office of Labour, Social Affairs and Family 2020a).

In the context of the above-mentioned and based on indicators, even though there were 207 184 job seekers registered by national labour authority and 66 493 available vacancies, we can see demand for labour has not been satisfied by the supply of domestic labour forces (Central Office of Labour, Social Affairs and Family 2021).

Internal migration in Slovakia

At present, it is not possible to fill vacancies with available domestic labour resources and thus ensure the stability of the labour market, which is one of the prerequisites for economic growth. The issue of immigration comes to the forefront as an ad hoc solution to the labour market deficit. Taking into account the fact that we are talking about a relatively new trend in Slovakia, many processes with the integration or involvement of foreigners in the labour market have not been sufficient.

Coleman (1992) presented an attitude that rejects immigration as a solution to the economic consequences of an ageing population and declining birth rate. In his study, he argued that immigration policy needs to take into account many negative aspects accompanying immigration. He emphasized that there are differences in approach to the integration of foreigners across the European Union. He also argued that the missing labour force can be replaced by retraining jobseekers or increasing women's participation in the labour market (Coleman 1992). Coleman's conclusions cannot currently be considered applicable to countries of the European Union, especially in view of the changed demographic trends over the past thirty years. In all Member States and candidate countries of the European Union, a percentage increase in population over the age of 65 by an average of 2.6 p.p. was recorded between 2008 and 2018 (Eurostat 2020). Due to negative demographic trends, countries' dependence on immigration will increase significantly. If countries want to maintain competitiveness and economic growth, immigration will become crucial (Ramos and Surinach 2013). Demographic trends in the countries of the European Union could be significantly changed in the future by migration of whole families from third countries and their subsequent reproductive behaviour (Ramos and Surinach 2013).

Coleman (1992) rejected the abandonment and relaxation of rules in immigration policies and favoured a restrictive policy in the area. Although he acknowledged the problem of labour shortages in selected regions, the conclusions of his study favoured migration within individual countries of the European Union over migration from third countries. According to Coleman's

study, it is not necessary for workers from third countries to enter the national labour market, as there is a relatively large supply of labour in its peripheral parts. He did not see a problem in its overall shortage, but in its uneven geographical distribution. To a large extent, these conclusions can be questioned. The rate of mutual migration between the states of European Union is insufficient.

The Slovak labour market is facing a labour deficit in selected regions. Should Coleman's theory be applied, foreign workers would not have to be employed; it would be enough to activate the available labour force living in the Prešov, Košice and Banská Bystrica self-governing regions (see Fig. 2 or Fig. 3). Migration in Slovakia has a predominant direction from the east of the country to the west and, based on the given criteria, it divides the country into the economically advanced west (respectively the northwest) and the lagging south (respectively the southeast) (Pregi and Novotný 2019). This type of migration has caused a decrease in the number of inhabitants in economically lagging regions. As can be seen from the paragraph below, willingness to migrate nationally in order to change jobs is low in Slovakia; these conclusions are also confirmed by the data of the Statistical Office. The other problem that is largely behind the high and unsatisfied demand for a labour force from the domestic supply is the disparity between the requirements of employers and the qualitative indicators of applicants. If we look at the statistics of job seekers in the group of the least developed districts of Slovakia, we can see that more than 80% of them belong to the group of disadvantaged job seekers. When entering the labour market, these persons have justified obstacles that cause increased costs for employers. The decision to migrate not only depends on economic conditions such as wages offered and vacancies, but is also influenced by non-economic factors. Some authors point out that the main reason that limits national migration in Slovakia is property ownership (Hricová and Madzinová 2020). Family ties also play an important role in migration. In countries with strong family ties, such as Slovakia, family members do not want to move far from their relatives, which significantly limits spatial mobility (Dorn and Zweimüller 2021).

Based on Coleman's theory, it can be argued that it is not applicable under Slovak conditions, as it cannot be expected that there will be a massive relocation of the workforce in the short term. Based on the results of the AKO Agency survey from 2018, 23% of respondents expressed willingness to change their residence due to employment. All respondents were unemployed and so the results of the survey can be considered to reflect the current situation in Slovakia (TASR 2018). In 2020, 1,933 persons out of the total number of domestic migrants, 87,853 (Statistical Office of the Slovak Republic 2020a), mentioned as the motive for internal migration a change of employment or access to employment, which represents 2.3% in percentage terms. Housing reasons (33,678) and following a family member (26,866) were mentioned as the most frequently cited reasons leading to internal migration (Statistical Office of the Slovak Republic 2020b).

Overview of the development of labour migration in Slovakia

Changes to the political and economic system following the dissolution of Czechoslovakia substantially influenced migration to and from Slovakia. During communism Czechoslovakia was an emigrant country. After establishment of an independent state in 1993, mutual migration between the Czech Republic and Slovakia was particularly important. Mutual shares of Czech immigrants to the territory of Slovakia and vice versa peaked in the aforementioned period. The share of Czech immigrants in Slovakia was 80% of the total number of migrants in 1993, and Slovaks accounted for up to 99% of all immigrants in the Czech Republic in that year (Divinský 2005).

Slovakia's accession to the European Union has led to a gradual increase in the number of migrant workers in Slovakia. The number of migrant workers increased significantly between the years 2010 and 2020, which was caused by positive development of basic macroeconomic indicators. According to the statistics of the Centre for Labour, Social Affairs and Family (2010, 2020) migrant workers came mainly from economically less developed countries in comparison to Slovakia and found their employment mainly in Bratislava self-governing region with a high concentration of industrial production caused by an inflow of foreign direct investment. The reasons for the predominant location of foreign direct investment in Bratislava self-governing region are its advantageous geographical location, the seat of state monopolies and banking institutions, the concentration of skilled labour force and the existing infrastructure (Šikulová 2014). The Fig.1 illustrates the percentage of the share of foreign direct investment in individual self-governing regions in Slovakia.

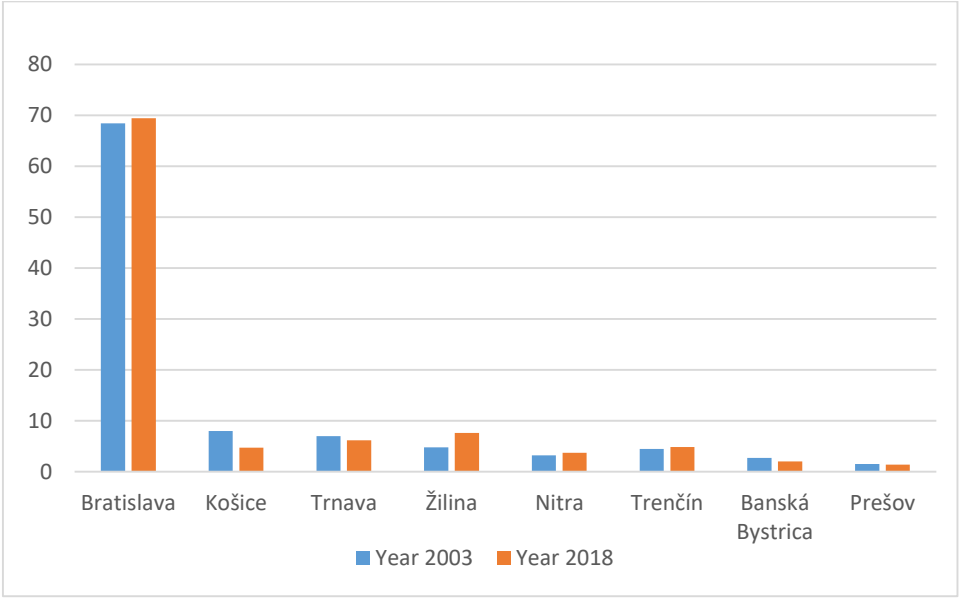

Fig. 1. *Percentage share of foreign direct investment in the years 2003 and 2018; Source: Author 's own processing according to Šikulová (2014) and National bank of Slovakia (2019)*

The accession of Romania and Bulgaria into the European Union in 2007 has further increased the total number of migrant workers in Slovakia from these countries. A higher intensity of immigration waves existed in symbiosis with the waves of emigration, especially to countries of the European Union, which opened the labour market for Slovak citizens in 2004 without the transitional period, such as United Kingdom (Káčerová and Horváthova 2014). Divinský (2005) states that a significant group of migrant workers in Slovakia after 2004 were highly qualified workers from the so-called old member states of the European Union. These foreigners worked mainly in managerial positions, which is a result of investment activities of companies from their home countries in Slovakia. Between the years 2004 and 2006, the share of migrant workers from EEA countries increased by about 10 p.p. to 73% (Central Office of Labour, Social Affairs and Family 2004 and 2006). Sekulová (2010) states that already in 2010 the Slovak labour market began to reach its capacities in filling vacancies, especially in the most developed districts of Slovakia. The growing demand for labour has subsequently been continuously increasing up to the present.

In 2020 the total number of migrant workers from European Union member states was 29,937, while the number of migrant workers from third countries was 39,075 (Central Office of Labour, Social Affairs and Family 2020b). The change in the long-term trend occurred in 2019, when the number of migrant workers from third countries exceeded migrant workers from countries of the European Union, respectively the EEA, for the first time.

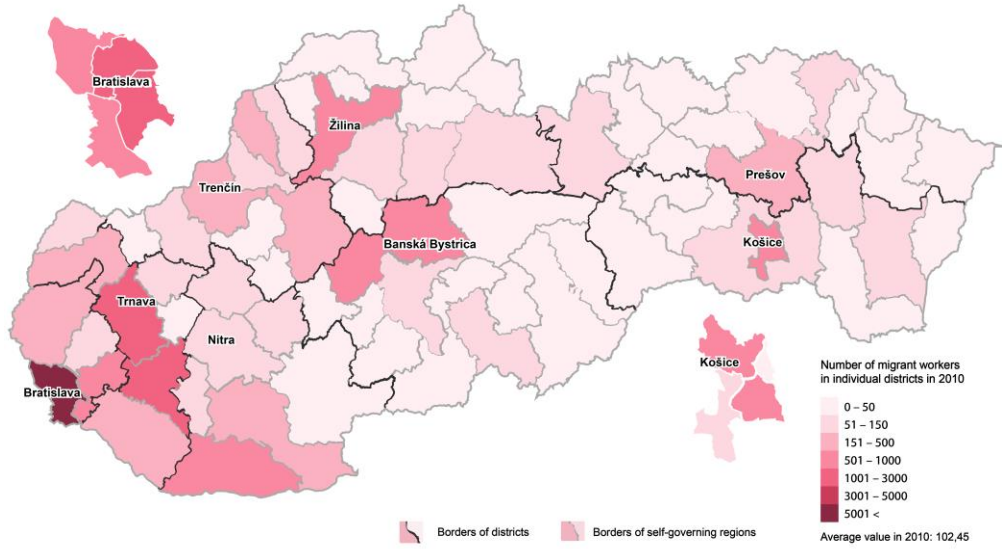

Fig 2. *Allocation of migrant workers into districts of Slovakia (December 2010); Source: Central Office of Labour, Social Affairs and Family (2010b)*

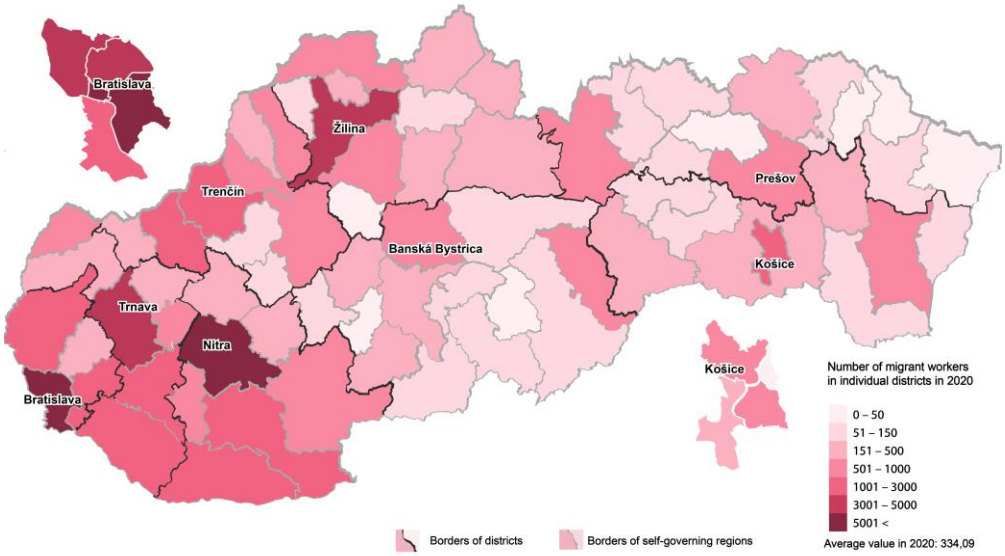

Fig 3. *Allocation of migrant workers into districts of Slovakia (December 2020); Source: Central Office of Labour, Social Affairs and Family (2020b)*

Results

Allocation of migrant workers in districts of Slovakia

The established hypothesis states that the number of migrant workers in individual districts is significantly related to the level of the average wage and the number of migrant workers in individual districts is significantly related to the number of vacancies. The Spearman correlation coefficient is used to determine correlation between the above two mentioned variables on the total number of migrant workers. We analysed data for the years 2010 and 2020 in order to monitor change and development of the variables over that decade.

As we can see in Fig. 4, the number of migrant workers in 2010 was related to the number of vacancies, as well as to the average wage in each district. While there is a correlation coefficient of 0.603 between the total number of migrant workers and the average wage in individual districts, the correlation coefficient between the absolute number of migrant workers and the number of job vacancies is 0.653. The two previously mentioned values are in the interval of medium strength and at the same time both are statistically significant, as the respective p-values are less than 0.001.

According to Fig. 4, in 2020 even closer correlations can be observed, as both correlation coefficients are higher, so we claim that there is a closer relationship between the selected parameters. The correlation coefficient between the total number of migrant workers and job vacancies is 0.872, which means that the coefficient is in an interval of very strong correlation. The correlation coefficient between the total number of migrant workers and the average wage is higher than in 2010.

Correlations

			Avarage wage [2010]	Job vacancies [2010]
Spearman's rho	Total number of migrant workers [2010]	Correlation Coefficient	,603	,653
		Sig. (2-tailed)	<,001	<,001
		N	79	79
			Avarage wage [2020]	Job vacancies [2020]
Spearman's rho	Total number of migrant workers [2020]	Correlation Coefficient	,677	,872
		Sig. (2-tailed)	<,001	<,001
		N	79	79

Fig 4. *Correlation coefficient for the years 2010 and 2020*; *Source: Central Office of Labour, Social Affairs and Family (2010a, 2010b, 2020a, 2020b), Statistical Office of the Slovak Republic (2010,2020b)*

If we examine the trend over the past ten years, the change in the total number of migrant workers correlates with the change of vacancies as well as with the change in the average wage. As we can see in Fig. 5, we correlated the difference between 2010 and 2020. It follows from Fig. 5 that the increase in the number of migrant workers correlates moderately

(0.590) with the average wage in individual districts and strongly correlates with the number of job vacancies (0.851). We can conclude that these correlations are direct and statistically significant (<0.001).

Correlations

			Avarage wage [difference]	Job vacancy [difference]
Spearman's rho	Total number of migrant workers [difference]	Correlation Coefficient	,590	,851
		Sig. (2-tailed)	<,001	<,001
		N	79	79

Fig 5. *Correlation coefficient – change between the years 2010 and 2020*; *Source: Central Office of Labour, Social Affairs and Family (2010a, 2010b, 2020a, 2020b), Statistical Office of the Slovak Republic (2010,2020b)*

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,731[a]	,535	,522	283,143

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6996150,982	2	3498075,491	43,633	<,001[b]
	Residual	6092934,992	76	80170,197		
	Total	13089085,975	78			

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-971,636	170,370		-5,703	<,001
	Average wage [2010]	1,471	,234	,515	6,276	<,001
	Job vacancies [2010]	1,168	,248	,387	4,710	<,001

a. Dependent Variable: Total number of migrant workers [2010]

b. Predictors: (Constant), Job vacancies [2010], Avarage wage [2010]

Fig 6. *Linear regression model year 2010; Source: Central Office of Labour, Social Affairs and Family (2010a, 2010b), Statistical Office of the Slovak Republic (2010)*

We also used linear regression to verify the combined effect of two factors on number of migrant workers, as we can see in Fig. 6. The correlation coefficient between the absolute number of migrant workers and the number of job vacancies and the level of wages is 0.731.

As we can see, the 52.2% variability in the number of migrants relates on the average wage and the number of vacancies (adjusted R square value). A p-value <001b confirms the suitability of a linear model, i.e the linear correlation of the number of migrants on the number of jobs and wages. From Fig. 6 we can derive an equation for estimating the number of migrant workers: number of migrant workers in district = 1,471 * average wage in district + 1,168 * number vacancies in district - 971,636.

The regression model for 2020 confirms an even closer linear correlation on a combination of factors, the number of vacancies and the level of the average wage, see Fig. 7. The correlation coefficient between the total number of migrant workers and the number of job vacancies and average wage is 0.924, which means that we are talking about a very strong correlation. The 85.1% variability in the number of migrant workers is related on the average wage and the number of vacancies (adjusted R square value). The p-value <001b confirms the suitability of the linear model, i.e. a linear correlation of the number of migrants on the number of jobs and wages. From Fig. 7 we can derive an equation for estimating the number of migrant workers: number of migrant workers = 1,688 * average wage in district + 0,934 * number of vacancies in district - 1873,432.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,924[a]	,855	,851	520,891

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121143668,367	2	60571834,183	223,243	<,001[b]
	Residual	20620869,000	76	271327,224		
	Total	141764537,367	78			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1873,432	398,157		-4,705	<,001
	Average wage [2020]	1,688	,363	,245	4,652	<,001
	Vacancies [2020]	,934	,064	,765	14,515	<,001

a. Dependent Variable: Total number of migrant workers [2020]

b. Predictors: (Constant), Vacancies [2020], Average wage [2020]

Fig 7. *Linear regression model year 2020; Source: Central Office of Labour, Social Affairs and Family (2020a, 2020b), Statistical Office of the Slovak Republic (2020b)*

Discussion

Based on above data, it can be concluded that the level of the average wage in individual districts and the number of vacancies are significantly related to the number of migrant workers in the given districts. The mutual connection of these variables on the number of migrant workers increased between 2010 and 2020. We point out that the value of the correlation coefficient between the level of average wage and the number of migrant workers is in both years lower than the value of the correlation coefficient between the number of vacancies and the number of migrant workers. Based on the above, we can agree with Geis, Uebelmesser and Werding's (2008) approach to examining the final migration selection process. These authors state that currently it is not possible to limit the decision-making process of migrant workers to just the impact of wage on final destination and it is necessary to take into account other economic and non-economic parameters together with the amount of provided wage in the final district. Based on linear regression, we also determined the combined interrelation of both factors on the total number of migrant workers in individual districts. From the performed analysis it can be concluded that, over time, the correlation of the number of migrant workers on those two factors has increased. Based on the performed analysis, it can be stated that economic factors have a significant influence on the distribution of migrant workers. However, as many contemporary authors state, research cannot be limited to the level of wages offered and other economic or non-economic factors must also be taken into account (Kennan, Walker 2011).

In the case of analysis of labour immigration, wage offered is considered to be one of the key factors in deciding on choice of final destination. Classical and neoclassical theories of migration are identified with this statement, which see the main cause of migration to be wage differences in sending and hosting destinations (Massey et al. 1993). There is a reasonable assumption that migrant workers coming to Slovakia would seek employment in districts where wage conditions offered are the highest. If we sort all districts according to the level of average wage in descending order, approximately 42% of the total number of migrant workers work in the ten districts with the highest level of average wage. But even in the first ten districts, ranked according to the level of the average wage, there are districts which, despite favourable wage conditions, do not record high numbers of migrant workers especially in comparison with districts in which average wages are lower (for example districts Košice I and II). Based on the allocation of migrant workers to individual districts, it can be stated that they are mostly distributed in a small number of specific districts. We emphasize the mutual relationship between the chosen variables, which influence each other. Economically developed districts with a high demand for labour forces naturally, due to the concentration of industry and services, record higher wage rates than less developed districts. However, there are exceptions: districts in which higher wage conditions alone cannot attract migrant workers. As an example, we present data from 2020 for the districts Malacky with an average wage of EUR 1,414 and Kysucké Nové Mesto with an average wage of EUR 1,407 (Statistical Office of the Slovak Republic 2020b). In Malacky district, the number of vacancies was 1,970 and the total number of migrant workers was 2,866, in Kysucké Nové Mesto district with similar wage conditions to Malacky, the number of vacancies was 212 and the number of migrant workers was 162 (Central Office of Labour, Social Affairs and Family 2020a, 2020b). It follows from the above that, although there is an unquestionable interrelation between the number of vacancies and the wage, the performed analysis also revealed exceptions in which the mutual correlation between two variables and the total number of migrant workers was not confirmed.

The highly concentrated allocation of migrant workers to a relatively small number of districts is in line with application of the gravitational model of migration (Ramos and Surinach 2013). Based on their model, labour immigration from third countries is significantly concentrated in selected areas, mainly due to strong cultural, political or economic ties between regions and incoming migrants. The assumption can be that absence of these links means that

selected regions are not recipients of migrant workers. Accordingly, this would mean that migrant workers in Slovakia would come to districts in which they have established social networks or another type of connection. Ramos and Surinach (2013) apply the gravitational model of migration not only to the regional allocation of migrants within individual countries, but also to their distribution from a European perspective. In view of the above, there is a presumption of further research which, in addition to economic factors, would also examine the significance of social ones.

Conclusion

The number of migrant workers in Slovakia increased significantly in the observed period between the years 2010 and 2020. This rapid quantitative increase was caused mainly by positive macroeconomic development, which acted as the main pull factor in labour immigration. According to the conducted research, the economic factors of migration can still be considered a key and significant driving force behind the decision of migrant workers to settle down in a particular district. Based on the Spearman coefficient and the testing of its significance and subsequent linear regression, we determined that both variables we selected, i.e. the number of vacancies and the average wage, had a major interrelation on the total number of migrant workers in the examined districts. A higher value of correlation coefficient was measured in both monitored years (2010 and 2020) in mutual relationship between the number of vacancies and the number of migrant workers than in the mutual relationship between the average wage and the number of migrant workers. When comparing 2010 and 2020, the correlation coefficient of both variables increased and we observed closer correlations.

Based on linear regression, we concluded that the combined influence of both variables on the total number of migrants in individual districts also increased. Based on the presented results, it can be stated that the conclusions of theories and authors who claim that the decision to migrate and the choice of destination are largely influenced by economic factors have been confirmed. Based on the performed analysis, we can conclude that favourable economic conditions are central motives behind labour migration in Slovakia. The mutual combination of the value of average wage and a high demand for work forces acts as the main pull factor of migration.

It should also be noted that neoclassical theories of migration and authors who limit their research to examining the impact of average wages on the number of migrant workers cannot be considered sufficiently reflective of the current situation and the range of variables examined needs to be broadened. Due to the lack of labour force in developed regions of Slovakia, and at the same time an insufficient rate of internal migration, international migration is becoming key. The influx of foreign workers plays an important role in fulfilling the demand for labour forces. A sufficient supply of labour meeting the requirements of employers is crucial for the sustainable development of the economy.

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