

The Belorussian IT sector as a panacea for the shortage of specialists in the labour market of selected post-communist countries

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ABSTRACT

Objective: The objective of the article is to analyse the status of IT specialists in the labour market of selected post-communist countries: Belarus, Poland, Lithuania, Latvia, Estonia, and Ukraine.

Research Design & Methods: The article used own calculations made based on available statistical data from the World Bank, European Commission, Polish Agency for Enterprise Development, Belstat, Ukrstat, and UNCTAD. A descriptive method was also used, as well as deductive reasoning, studying the literature of the subject, and analysis of source texts.

Findings: The article demonstrates that despite the difficult socio-political situation and the deteriorating condition of the Belorussian economy, IT specialists from this country can be a panacea for staff shortages in the labour market in neighbouring countries, i.e. in Poland, Ukraine, and the Baltic States. The article also analyses the offers of the above-mentioned post-communist countries that received migrants from the Belorussian IT industry.

Implications & Recommendations: We show that Poland has significant economic potential (and economic ties) in terms of incentives for employees of the Belarussian IT sector. The potential of the rest of the studied countries is in total comparable to that of the Republic of Poland – compared with Lithuania, Latvia, Estonia, and Ukraine. Relocation of Belarussian IT specialists may contribute to the improvement of competitiveness and innovation of the host countries.

Contribution & Value Added: The interest of the countries neighbouring Belarus in the process of encouraging Belarussian IT specialists to emigrate from their homeland has been confirmed and there are very few studies on similar topics in the literature. Moreover, the conclusions drawn from the conclusions of the study may serve as recommendations for specific actions at the government level.

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INTRODUCTION

In recent years, the dynamic transformation process has resulted in changes in business models, organization, and operational processes of enterprises (Dolan *et al.*, 2015). According to the OECD report (Spesia *et al.*, 2016) the skillset necessary for employees to perform their professional tasks is changing due to the increasing use of Information and Communication Technologies (ICT) since the digital work environment increases analytical and interactive requirements. As emphasized by Lucas *et al.* (2013), digital transformations are supported by the so-called 'Transformational IT' that has the potential to shape and transform the economy by changing processes, creating new organizations, or enabling market entry. It changes social relationships and user experiences, and the process of acquiring new customers. Among

the main technological drivers of change are: skills, technological innovations such as mobile Internet and cloud technology, computing power and Big Data, Internet of Things, robotics, and artificial intelligence (Leopold *et al.*, 2016). Today, these technological innovations are being promoted in the context of Industry 4.0 and other digitalization initiatives. In recent decades, increasing IT investments have been observed to induce major changes in new business processes, skills and industry and organizational structures, resulting in an overall increase in productivity (Brynjolfsson & Hitt, 2000).

It is estimated that by 2020 the shortage of digital specialists in Europe will be approx. 756 000 (Berger & Frey, 2016). However, based on quantitative modelling, a report published by the BCG group predicts a net increase of approx. 350 000 jobs in Germany by 2025, with significant job growth expected in systems design, IT and data science and the highest growth of approx. 70 000 new jobs for industrial data scientists (Lorenz *et al.*, 2015). Evidence from the research available in the literature suggests that increasing digitization, automation, and broadly understood technological changes have led to the emergence of jobs requiring higher qualifications (Gallie, 1991).

The IT sector has a specific character, which distinguishes it from other sectors of the labour market, as well as regional specificity. The development of technology drives the search for IT specialists; the IT outsourcing market in Central and Eastern Europe is growing much faster (20-25% y/y) than the global market (5%). Combined with the dynamic growth in revenues of software development companies, the sector sees an increasing number of mergers and acquisitions. Over the past four years, over 70 custom software development company M&A transactions have been recorded in the region. The execution and innovation of successful software development projects are rooted in people's talent and finding great talent remains one of the biggest challenges in the industry.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In the European Union, the importance of the IT sector depends on the number of enterprises and the number of specialists employed in the sector. For example, according to research conducted in previous years, developed countries are increasingly dependent on the IT sector (Maryska *et al.*, 2012). Other researchers point out that there is a relationship between GDP and the results achieved by the IT sector (Vu, 2011; Ho *et al.*, 2011; Warr & Ayres, 2012; Sylwestrzak, 2018; Fernandez-Portillo *et al.*, 2020; Vu *et al.*, 2020). In addition, it has been observed that developed countries introduce innovations to increase their competitiveness, while developing countries take measures to increase the use of the IT sector to stimulate economic growth (Savulescu, 2015).

In connection with the above, the IT market, both domestic and European, attracts the attention of the media and experts. On the one hand, universities are encouraged to educate more and more graduates, on the other hand, there is a growing gap between the needs of this market in terms of a qualified workforce and the supply of specialists. It is estimated that the shortage of IT specialists on the European market may reach 1 million; in Poland, there is talk of a shortage of over 100 000 specialists (Rasińska, 2016). Currently, more than 85% of jobs within the European Union require at least basic digital skills (CEDEFOP, 2018).

The gap of IT specialists in the EU has been one of the most important challenges in the eyes of the European Commission for several years. Already in the documents from 2016, there is a statement that without reducing the gap of IT specialists (then estimated at 756 000 people) 'Europe will not be able to cope with the digital transformation' (European Commission, 2016). Unfortunately, this problem has still not been solved and still occupies a high position on the list of priorities of the European Commission (European Commission, 2021). In the strategic document 'Europe's Digital Decade' presented in 2021, the European Commission set a goal: 80% of the population with at least basic digital skills and 20 million IT professionals in 2030 (European Commission, 2021).

IT specialists are currently the fourth most sought-after group of employees. According to ManpowerGroup (2021), this is a group that has been consistently climbing the ranking of the most sought-after specialists for the last few years, which means a deepening shortage in IT-related professions. Due to the shortage of specialists in the domestic market of Central and Eastern European countries,

decision-makers more and more often create conditions for an attractive relocation of IT specialists from other countries, most often neighbouring ones.

Due to the political and economic situation, Belarus is becoming less and less attractive as a place for innovative business. Therefore, it is a particularly attractive country as a source of IT specialists in the region, and countries with a post-communist origin similar to Belarus, *e.g.*, Poland, Lithuania, Latvia, Estonia, and Ukraine are competing to recruit high-quality IT employees from there.

The article uses own calculations made based on available statistical data (World Bank, The European Commission, Polish Agency for Enterprise Development, Belstat, Ukrstat, and UNCTAD), a descriptive method was also used, as well as deductive reasoning, studying the literature of the subject and analysis of source texts.

The article aims to diagnose the status of IT specialists in the labour market of selected post-communist countries: Belarus, Poland, Lithuania, Latvia, Estonia, and Ukraine. To achieve the set goal, research hypotheses were defined:

- H1:** The potential and qualifications of the employees of the Belarusian IT sector make it possible to overcome the shortages of specialists in the labour market of selected post-communist countries: Belarus, Poland, Lithuania, Latvia, Estonia, and Ukraine.
- H2:** Relocation of Belarusian IT specialists improves the competitiveness and innovation of the host economies.
- H3:** The activity of the employees of the Belarusian IT sector impacts the level of self-employment in the markets of the selected post-communist countries.

RESEARCH METHODOLOGY

This part of the article will present a description of the economic potential and current conditions for the development of economic relations of Poland with Belarus, Lithuania, Latvia, Estonia, and Ukraine.

The selected neighbouring countries have a joint potential comparable to the economic potential of Poland, as evidenced by the data included in Table 1.

Table 1. The share of Poland and selected countries of its Eastern Neighbourhood in the global area, population and GDP in 2019, in %

| Country | Area | Population | GDP |
|-----------|------|------------|------|
| Poland | 0.24 | 0.50 | 0.68 |
| Belarus | 0.16 | 0.12 | 0.07 |
| Estonia | 0.03 | 0.02 | 0.04 |
| Lithuania | 0.04 | 0.04 | 0.06 |
| Latvia | 0.04 | 0.02 | 0.04 |
| Ukraine | 0.46 | 0.59 | 0.18 |

Source: own elaboration of World Bank (2021a).

In 2019, the area of the countries presented accounted for approx. 73% of the total area of the world (together with Poland, 0.97% in total), and the number of inhabitants is approx. 0.79% of the world's population (with Poland in total, approx. 1.47%) In the analysed year, these countries accounted for only 0.39% of the world's GDP, and Poland – 0.68%. It was the result of various factors, including diversified effects of economic transformation, the shaping of diversified economic structures, and the diversified degree of use of the opportunities resulting from the active division in the international division of labour (Table 2).

The economies of the analysed countries differ in terms of the share of the private sector. Excluding Poland, this share is relatively highest in Estonia, Latvia and Lithuania, and lowest in Ukraine, and Belarus. Ukraine and Belarus are characterized by the highest share of agriculture in generating national income. On the other hand, Poland, like most countries, is characterized by a comparable share of industry in generating GDP. An exception in this respect is Belarus, where this share is, respectively,

higher by 2.65 pp compared to Poland. The studied former Soviet republics differ in terms of the share of services in the economy. The highest share of services in generating national income is found in Latvia, Estonia, and Lithuania, and the lowest in Belarus.

Table 2. The structure of the economy of Poland and neighbouring countries in 2019, in %

| Country | The share of the private sector in generating GDP | Structure of GDP creation | | | Demand structure | |
|-----------|---|---------------------------|----------|----------|------------------|--------------|
| | | Agriculture | Industry | Services | Consumption | Accumulation |
| Poland | 72.3 | 2.35 | 28.65 | 57.52 | 75.54 | 19.75 |
| Belarus | 24.6 | 6.78 | 31.30 | 48.82 | 70.91 | 28.98 |
| Estonia | 70.4 | 2.49 | 22.04 | 62.48 | 68.87 | 27.69 |
| Lithuania | 57.0 | 3.22 | 25.26 | 61.38 | 78.45 | 22.38 |
| Latvia | 69.9 | 3.72 | 18.56 | 64.73 | 77.33 | 17.46 |
| Ukraine | 47.0 | 9.01 | 22.56 | 54.43 | 95.23 | 13.00 |

Source: own elaboration of World Bank (2021b), European Commission (2021), eu4business (2021), and PARP (2021).

Table 3. The economic potential of the analysed former Soviet republics and the degree of its realization compared to Poland in 2019 (basic indicators, Poland = 100%)

| Category | Belarus | Estonia | Lithuania | Latvia | Ukraine | Poland | |
|---|---------|---------|-----------|--------|---------|--------|-----|
| Area | 66.39 | 14.46 | 20.85 | 20.66 | 193.02 | 100 | |
| Population | 24.81 | 3.50 | 5.04 | 7.36 | 116.91 | 100 | |
| GDP | 10.59 | 5.28 | 5.72 | 9.17 | 25.81 | 100 | |
| Participation in trade in goods | Import | 15.99 | 7.56 | 14.50 | 7.20 | 24.63 | 100 |
| | Export | 13.02 | 6.68 | 13.16 | 5.74 | 19.87 | 100 |
| Participation in trade in services | Import | 13.30 | 12.89 | 17.67 | 8.00 | 35.02 | 100 |
| | Export | 13.35 | 10.99 | 18.34 | 8.76 | 24.03 | 100 |
| Cumulative production capital resources | Inflow | 9.78 | 23.03 | 7.38 | 5.97 | 23.22 | 100 |
| | Outflow | -0.32 | 92.26 | 7.18 | -7.55 | 30.39 | 100 |

Source: own elaboration of World Bank (2021b) and UNCTAD (2021).

Furthermore, among the analyzed countries, Poland can be considered a leader both in terms of the broadly understood economic potential and the degree of its realization, including through participation in the international division of labour (Table 3).

From the point of view of the size of the economic potential and the degree of its use, Poland and its eastern neighbours do not constitute a homogeneous group. This set of countries can be divided into three groups. Firstly, there is Ukraine with its significant potential, exceeding the economic potential of Poland, but using it less effectively than Poland. Secondly, there are countries with relatively small potential, which they do not use effectively. For example, Belarus pursues a policy of strictly autonomous economic development. Due to this state of affairs, the economy of Belarus is characterized by considerable disproportions, even compared to Ukraine. On the other hand, in Poland, Estonia, Latvia, and Lithuania, economic growth depends mainly on the service sector, and then on the industry sector (Table 4).

The above-mentioned conditions affect the development of innovation and competitiveness of the discussed countries. As can be seen from the data in Table 4, the ICT sector in Poland has the largest share in the added value. The Belarusian ICT sector ranks second in terms of the value of this index. Compared to the analyzed former Soviet republics, Poland has a high number of people employed in the ICT sector.

Table 4. The importance of the IT sector in Poland and in neighbouring countries

| Category | Belarus | Estonia | Lithuania | Latvia | Ukraine | Poland |
|--|---------|---------|-----------|--------|---------|--------|
| Share of the ICT sector in GDP, % (2018) | 5.6 | 5.38 | 3.13 | 4.92 | 3.90 | 3.59 |
| Share of ICT in value added, % (2018) | 6.5 | 5.22 | 3.94 | 4.88 | 4.60 | 7.72 |
| Share of employees in the ICT sector (2018) | 2.7 | 6.5 | 3.3 | 3.7 | 1.73 | 3.4 |
| No. of employees in the ICT sector, in thousand (2018) | 100.7 | 42.4 | 44.5 | 33.0 | 283.0 | 553.9 |
| Share of the ICT sector in exports of goods, % (2018) | 0.75 | 8.51 | 3.48 | 8.44 | 0.98 | 6.91 |
| Share of the ICT sector in import of goods, % (2018) | 3.61 | 8.48 | 4.89 | 8.24 | 5.80 | 8.52 |
| Share of the ICT sector in exports of services, % (2018) | 20.79 | 11.11 | – | 13.91 | 21.85 | 10.92 |
| Share of the ICT sector in import of services, % (2018) | 5.24 | 8.93 | – | 10.70 | 4.10 | 9.28 |

Source: own elaboration of World Bank (2021d), UnctadStat (2021), Belstat (2021), and Ukrstat (2021).

RESULTS AND DISCUSSION

Characteristics of the current social and political situation and the state of the economy in Belarus

In 2021, Belarus is struggling with the problems that appeared both in 2020 and in previous years. The deteriorating state of the economy, the COVID-19 pandemic, the poor political and social situation, international protests against totalitarian rule, as well as the existing and planned international sanctions determine the further course of events. Among the possible scenarios for the development of the situation in Belarus, a combination of political, social, and especially economic and financial events, which may significantly affect the level and structure of labour migration cannot be excluded.

The deteriorating social mood among Belarusian citizens, brutal and cruel repression of the society's awakened aspirations, the persistent social tension, uncertainty of tomorrow, and instability in the internal situation resulting from the changes that took place after the rigged presidential elections and mass violent civil protests are among the socio-political causes of migration, including that of IT specialists. Of course, IT scientists became part of political protests. A sign of the involvement of the IT sector in politics was the candidacy of the president, founder, and head of the Belarusian Hi-Tech Park, Valerij Tsepka. The IT professionals played an active role in Tsepka's campaign as well as in the campaign of another candidate, Viktor Babarika (Sergei, 2020). Previously, in 2005, he was also an advisor to the President of the Republic of Belarus and the representative of the President of the Republic of Belarus in the National Assembly of the Republic of Belarus. After the rigged elections, many IT scientists took part in mass protests. As independent experts, they were not afraid of losing their jobs. They protested in the name of civil rights and European values, in opposition to the Soviet military aesthetics of an authoritarian state in which they had no real right to vote. Many IT scientists have volunteered for various solidarity funds set up to help victims of state forces. Several thousand senior executives and other tech industry representatives have signed an open letter calling for the cessation of violence against demonstrators, holding those responsible for the fraudulent election accountable, and holding new, transparent elections. The growing repression, the strengthening of the regime, and the government's efforts to suppress the resistance of society while President Lukashenko postponed the introduction of systemic and constitutional changes. Moreover, the open search for help and favour from Russia has a detrimental effect on the socio-political situation in Belarus. Moreover, it can be clearly observed that Belarusian authoritarianism is rapidly radicalizing, independent media are being liquidated, and protest participants, trade union activists, lawyers, students, human rights defenders and journalists are intimidated and repressed. Brutality is followed by several-year incarceration sentences, and the number of political prisoners is growing. The date of the constitutional referendum has also been postponed – to early 2022.

The state of the economy was a catalyst for past events in Belarus and will also remain a problem in the coming years. The weakness of the Belarusian economy is systemic. It is an antiquated, post-

Soviet model of central planning, state ownership of most means of production, and a classic dependence on Russia. Forecasts of the International Monetary Fund (IMF, 2021) indicate that in 2021 economic growth in Belarus will be negative (-0.4%). World Bank forecasts predict a deepening recession in 2021 related to the lack of structural reforms, declining domestic demand, and possible economic sanctions. Recently announced tax increases to curb the fiscal deficit and pension system will negatively impact the already troubled private sector, which has suffered from a lack of support during the COVID-19 shock. Slow economic growth is also expected to reduce imports and the current account deficit. This perspective depends on the availability of external financing, especially from Russia. The following years 2022-2023 will be even more difficult, as the repayment of bilateral loans to Russia is due in 2022, and the repayment of the capital of Eurobonds and a loan for a nuclear power plant in 2023. In addition, it is estimated that in 2021, poverty indicators in Belarusian society will increase by 0.1 percentage point (World Bank, 2021c). It is worth emphasizing that the economic factor is an important instrument of influence used by Russia on Belarus. Manipulating the supplies of raw materials and credits or taking over the transit of Belarusian petroleum products will continue to deepen Belarus' economic dependence on Russia. This is particularly important in the context of Russia's dissatisfaction related to the unstable internal situation in Belarus.

In recent years, starting from 2016, Belarus was observed to progress in the economic freedom index ranking. There has been progress in areas such as investment and monetary freedom, property rights, and government conscientiousness (OECD, 2020). In 2020, Belarus was ranked 41st among European countries, although its overall result is well below the regional average and slightly below the global average. For the first time, the Belarusian economy was included in the group of countries characterized by moderate economic freedom. Belarus's GDP growth has not yet reflected this, mainly due to the poor recovery after the economic recession in 2015-2016 and low energy commodity prices (Heritage, 2021).

With the increase in global oil prices and the demand for Belarusian industrial goods from Russia, the Belarusian government will have a chance to take additional reform measures aimed at strengthening the effectiveness of the judiciary and government actions, which will help raise the level of economic freedom in Belarus.

However, the economic situation is likely to deteriorate in 2021. The debt of major enterprises (mostly state-owned) will exceed GDP, foreign investors are withdrawing, exports are falling, and the massive withdrawal of savings from banks is accompanied by the devaluation of the Belarusian rouble and an increase in inflation (7.7% in January 2021). The slowdown in the development of the IT industry, which has been rapidly developing since the 1990s, can be particularly severe, generating 6.5% of GDP in 2019, comparable to agriculture or transport (it was expected to be 10% in 2023). This fastest-growing sector of the economy is currently 'in retreat' as companies and employees are moving, among others to Ukraine, Lithuania, and Poland. This may not only hit the economy but also affect the country's image and deteriorate the investment climate.

In Belarus, the state budget subsidizes primarily industrial sectors that are important from the economic point of view. The Belarusian Innovation Fund offers vouchers worth up to 25,000 USD and grants of up to 10,000 USD (Belinfund, 2021). The Belarusian state plays an active regulatory role in the use of the available production potential. In the most important economic matters, decisions are made personally by the president of Belarus, who has the necessary powers. The political system and social conditions have a negative impact on innovative enterprises that take risks and often stay ahead of the regulations that would regulate the sphere of innovation.

Summing up, it should be mentioned that after the recent events of May 23, 2021, related to the abduction of the Belarusian opposition activist Roman Protasiewicz (Consilium, 2021a) from an airplane flying over Belarus, the international community – especially EU countries (European Parliament, 2021), the USA and the United Kingdom – is considering the introduction of severe, targeted economic sanctions (Newsbeezzer, 2021). They may include sectors of strategic importance to the Belarusian economy, such as the processing and export of crude oil, processing potassium salts used in the production of fertilizers, the metallurgical industry, the wood industry, the automotive industry, tobacco industry and the banking sector, including blocking access to the SWIFT system and restricting Belarus' access to

many financial products, *e.g.*, certain loans and bond issues (Consilium, 2021b). As a result, there may be a shortage of foreign exchange inflows from exports, which will impact the stability of the financial market and probably result in the devaluation of the Belarusian currency, followed by high inflation.

The above-mentioned socio-political problems of Belarus, as well as those related to the country's weakening economy and financial instability in the foreseeable future can cause further migration of the population, and in the case of highly qualified specialists, even a *bona fide* exodus. Moreover, Lukashenka's regime can plan to ease social tensions by not blocking, or even facilitating emigration towards socially active, young, and well-educated people, including IT specialists.

International conditions for the development of the IT sector in Belarus and reasons for the emigration of Belarusian IT specialists

There is interesting research available on the prospects for the development of the IT sector in Belarus and the possible migration of employees in this sector, *e.g.*, as part of the International Political Economy. It demonstrates a strong relationship between the type of political regime and economic policy, along with economic development. This dependence is especially emphasized in the case of authoritarian regimes seeking to control or influence most of the social processes in the country, primarily political but also economic. However, the relationship between the type of political regime and economic relations in the international dimension, *e.g.* openness to cooperation with foreign countries, is not clear-cut. First of all, it is emphasized that nondemocratic regimes are generally more closed to international cooperation than democracies. However, unlike democracies, highly institutionalized and stable authoritarianism can strategically plan and implement these plans in the long term. In some cases, they can be quite liberal in terms of international economic cooperation and favour it (Weeks & Crunkilton, 2017). Research for the development of a climate fostering international cooperation, including foreign investment also shows that consolidated authoritarianism, on a par with democracies, can effectively create favourable conditions for the development of investment and international cooperation. Hybrid regimes, such as unconsolidated democracies or unconsolidated authoritarianism, are much worse at creating favourable conditions for doing business and cooperating with foreign countries (Bayulgen, 2010). Moreover, research shows that authoritarian regimes in general are much less prone to international cooperation than democracies, even doubly lesser in the case of cooperation with democracies, compared to democratic countries. This propensity to conclude cooperation agreements with other authoritarian systems can be even four times lower than that of democratic states (Mansfield *et al.*, 2002). Finally, one of the basic relationships between authoritarian systems and their economies is their will to control economic processes, aimed at eliminating all groups of influences, as well as phenomena that threaten power, including economic ones (Kneuer, 2007). In addition, scientific research highlights the fact that authoritarian systems are less susceptible to economic pressure (Blanchard & Ripsman, 2008). Therefore, they pay less attention to economic interests and can sacrifice them for the benefit of other interests.

Therefore, the reason for the great success behind the development of the IT sector in Belarus was, paradoxically, the economic underdevelopment of the country. It was this factor that made the authorities more willing to support the idea of establishing a sector that could become the country's showcase. Belarus is an example of a country where no real systemic transformation was carried out after the collapse of the USSR. This very clearly increased the investment attractiveness of this country, which for investors appeared to be non-transparent in terms of procedures, with a small share of the private sector in which investors could operate (Westernhagen, 2002). Moreover, it is indicated that in Belarus, as in any authoritarian country, business is dependent on politics. On the one hand, the authorities discredit business as a group that can potentially influence the perception of power. On the other hand, however, the government can create favourable conditions for running a business to promote itself on such activities (Grevtsova, 2018). Therefore, the lack of modernization of the country, combined with the political will, enforced the idea of building a 'Silicon Valley' in Belarus. The High Technology Park (HTP) was something that Lukashenko could accept as he did not consider the IT sector strategic, as is the case with heavy industry or other sectors of the economy (Euronews, 2020).

The success of the Belarusian IT sector is mainly related to international cooperation. The High Technology Park itself is largely based on foreign investments; over 40% of its residents are companies with foreign capital. The amount of direct foreign investment in 2019 amounted to 263 million USD. During the three years of operation, Park 2.0, has attracted a total of over 700 million USD of foreign investment. Moreover, the Park currently houses 107 development centres for international companies.

As mentioned above, after the adoption of Decree No. 8 in 2017, the exports of services increased sharply and in the record-breaking 2019, the Park's exports amounted to 2195 million USD, with a growth rate of 155%. The number of new companies in the Park is also growing at an impressive pace. In just two years after the adoption of the digital decree, the number of Park's residents has quadrupled, from 192 to 969 (HTP, 2020a). A sharp increase in exports of services has been observed in the High Technology Park itself.

The issue of Belarus' openness to international cooperation is of key importance for the condition and further development of the country's IT sector. Therefore, the above-mentioned research on the impact of political conditions on the state of the economy seems to be of key importance for the migration of Belarusian IT specialists as problems in this area can determine the condition of this sector and impact decisions regarding the emigration of IT employees. The IT sector is one of the most dynamically developing sectors in Belarus. In 2015, it was 3.5%, in 2018 it already accounted for approx. 5.5% of the country's GDP (President, 2020), and in 2019 it was already 6.6% (Belstat, 2020), which is a significant number for a country that bases its economy mainly on industry. In 2019, approx. 54.2 thousand IT specialists were recorded in Belarus and approx. 1.5 thousand IT companies (as previously mentioned, however, these are estimated data). Belarusian IT companies cooperate with clients from over 50 countries worldwide. In 2018, IT accounted for 2.2% of total employment and 14.5% of all new jobs in the country (Murphy, 2020). The main sales of Belarusian IT companies go to foreign markets. Over 90% of the software produced in the Park is exported: 49.1% – to European countries, 44% – to the USA and Canada, 4.1% – to Russia, and other Commonwealth of Independent States (CIS) countries (Belarus, 2021).

The Belarusian IT sector consists in 60.5% of outsourcing companies and in 39.5% of production companies (data for 2018). Belarusian outsourcing tycoon EPAM (Effective Programming for America) Systems is a leading global provider of digital platform engineering and software development services. EPAM has offices in North America, Europe, and Asia and was on Fortune's list of 100 fastest-growing companies in 2019. International giants such as Google and Yandex also have R&D centres in Belarus. There are many indications that the motivations for the emigration of Belarusian IT sector employees will be related to geopolitical issues as the Belarusian authorities pursue a policy of manoeuvring between Brussels and Moscow and curbing Russia's influence. On the one hand, it can cause greater concessions to Brussels and thus improve the business climate in Belarus. Thus, the more oppressive the regime, the greater the citizens' motivation to emigrate. Research among investors indicated that the Belarusian government favoured Western investors to restrict the influence of Russian investors and ties to Russia. However, on the other hand, IT is developing dynamically, due to the greater impact not of the financial but of the intellectual component on its development. This is due to the country's backwardness, the lack of private investment funds and the statist policy of the state. The main feature of the Belarusian IT sector is its specialization in software outsourcing, and not in developing IT products for domestic consumption. This makes the sector export-oriented and cosmopolitan, unlike the industry in Belarus, which operates under an authoritarian regime. Thus, in the absence of raw material resources, the main mechanism of adapting the IT entrepreneurship environment to the conditions of the authoritarian-personalistic regime is the concentration of investments on the development of the intellectual property market, while at the same time founding the IT sector on outsourcing. Such development can only take place in the absence of factors limiting its expansion in the international arena. The presented thesis is also confirmed in relation to other countries. Among the ten most developed IT outsourcing countries, there is not a single mature democracy (India, Bulgaria, China, Argentina, Philippines, Egypt, Chile, Brazil, Indonesia, Thailand). In countries with authoritarian tendencies, citizens more often invest in areas that cannot be easily controlled by the state and which can flexibly react to its oppressiveness. The increasing oppressiveness of the system, combined with closing off to cooperation with regions important for the development of the IT sector in Belarus (the West), will prompt citizens to emigrate.

The data on the development of the Belorussian IT sector confirm the previously quoted research results regarding the political conditions of economic development, especially in authoritarian regimes. During the time of relative political and economic stability in Belarus, there was a rapid increase in new companies in the Park: from 33 in 2017, to 268 in 2018, to 319 in 2019, and down to 236 in 2020 (Grevtsova, 2018).

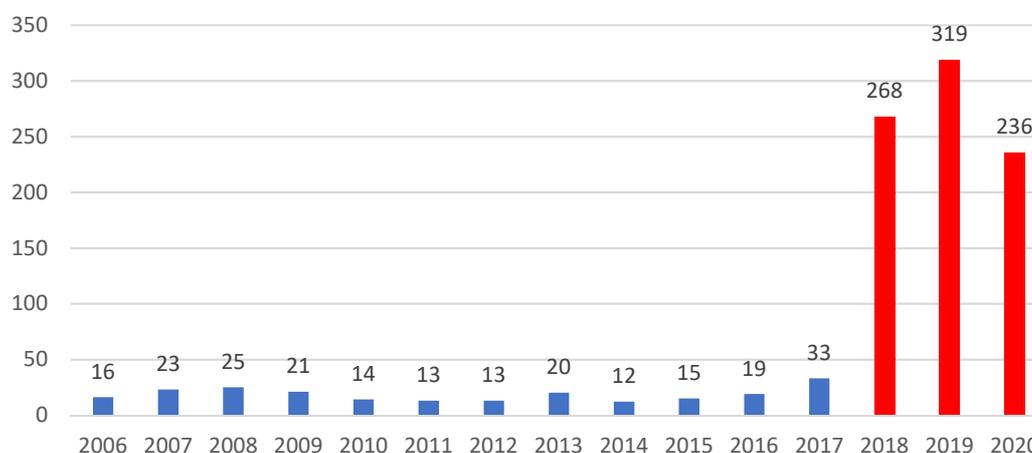


Figure 1. Increase of new companies in the High Technology Park

Source: HTP (2020b).

Experts note that the legislation related to the IT sector has significantly changed Belarus's position in the rankings for ease of doing business, taking it to the 37th place in the 2019 report, which is 26 places higher compared to 2014 (Murphy, 2020). In the 2020 report, Belarus dropped to 49th place (Doing Business, 2019 and 2020). This is noteworthy as this decline could have been related to the growing oppressiveness of the political regime in Belarus. It should also be emphasized that the outdated Belorussian economy is subject to a great level of state control. Approx. 70% of the industry is in the hands of the state and 80% of the banking sector (Rosandic, 2018), therefore, the IT sector has a special position in this system.

Actions taken by selected post-communist countries to recruit IT specialists from Belarus

In this part of the manuscript, the factors attracting employees of the Belorussian IT sector to the studied post-communist countries will be presented and actions taken by selected post-communist countries to recruit IT specialists from Belarus.

The Belorussian IT sector is interested in moving its offices and branches, as well as highly qualified employees, to the Baltic States and Poland. This not only means an increase in the number of employees in the IT sector in these countries, and strengthening them, but also in the available software. This, in turn, can bring about an increase in the competitive potential against the countries that are leaders in this industry. The incentives offered to Belorussian entrepreneurs play an important role in this respect. What Belorussian enterprises care most about is the speed and simplicity of setting up operations in the country of relocation. This is why the regulations of migration processes, quarantine issues, taxes and registration procedures are important.

Ukraine

According to a survey conducted by the dev.by portal in October 2020, Ukraine was the most popular relocation destination among employees of the Belorussian IT sector.

On October 4, 2020, the President of Ukraine, Vladimir Zelenskij, signed the Decree No. 420/2020. On the one hand, this document aims to promote and develop Ukraine's investment potential, and on the other, it is to help attract highly qualified IT specialists and innovators (President, 2021). Pursuant to the decree, on December 23, 2021, the Council of Ministers of Ukraine issued Regulation No. 1302

stating that until December 31, 2021, citizens of the Republic of Belarus who have legally entered Ukraine can stay on its territory for a period not longer than 180 days, for 365 days (KMU, 2020a). The explanatory note added that ‘the regulation shall apply to Belarusian citizens who are entrepreneurs, highly qualified specialists, in particular IT and innovation specialists, whose emigration is in the interest of Ukraine, as well as their family members. At the same time, it was emphasized that the amenities are aimed at those who, in accordance with point 2 of Art. 4, part II of the Law ‘On Immigration,’ apply for an immigration permit as highly qualified specialists and workers, with qualifications necessary for the economy of Ukraine. They shall apply to the State Immigration Service for a temporary residence permit and receive it promptly’ (KMU, 2020b).

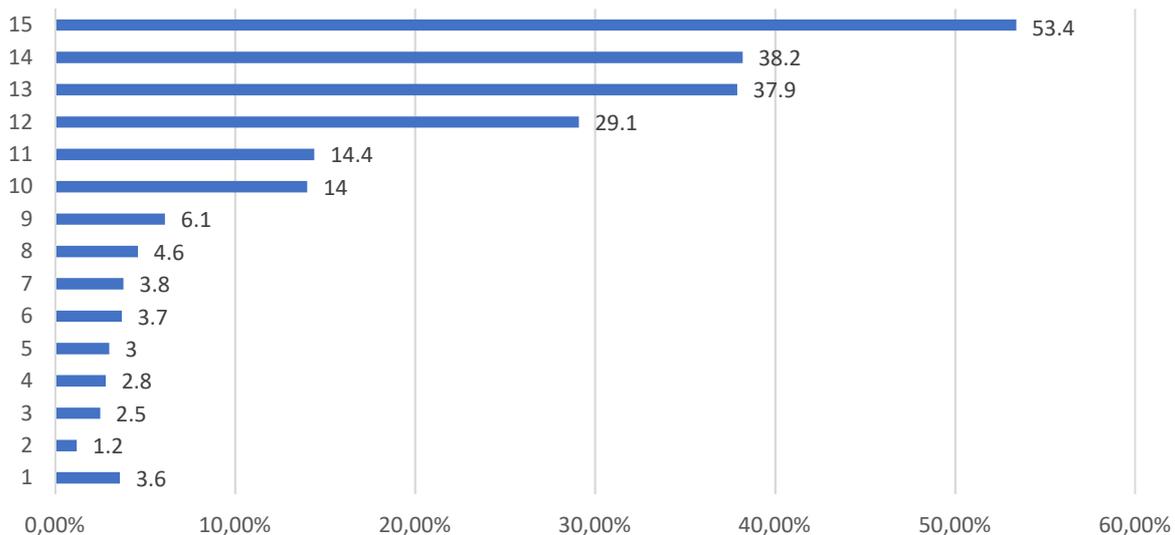


Figure 2. Relocation direction of Belarusian IT workers

Source: Datawrapper, 2021.

At the same time, the decree provided for the following amenities for Belarusian IT workers:

- shortening the period of issuing work permits to foreigners and stateless persons from seven to five days from the date of submitting the documents (the so-called ‘silent approval’ shall apply);
- streamlining the procedure of registering a natural person as an entrepreneur and uniform taxpayer;
- introducing a pilot project to simplify the registration of temporary residence permits with the possibility of shortening the deadline for issuing the document to three days, without the need to leave the territory of Ukraine.

Moreover, the latter two regulations apply to family members of such persons. Additionally, for all Belarusian citizens who intend to emigrate to Ukraine, the decree provides:

- recognition of documents issued by the Belarusian authorities that are necessary to work in Ukraine;
- efficient operation of a single, dedicated website and hotline to consult Belarusian citizens interested in migrating to Ukraine (Everlegal, 2021).

The above-mentioned information portal was launched in September 2020. This was the result of joint actions undertaken by the Ministry of Digital Transformation of Ukraine, Ukrainian IT associations, such as the European Association of Software Engineering Ukraine (EASE, 2021) or the Ministry of Economy of Ukraine and the Ministry of Foreign Affairs of Ukraine (VCTR, 2021), which developed a project entitled IT Relocate Беларусь (Belaroustoukraine, 2021). Ukraine has launched a website that contains complete information about a stay in Ukraine, as well as legal advice, useful links, and other information. At the same time, Ukrainian companies and organizations have been allowed to offer services that support relocation. For this purpose, they can post relevant information on the project website.

Moreover, as reported by Ukrinform, on November 18, 2022, the Ukrainian government supported the bills ‘On amending certain legislative acts of Ukraine to improve migration legislation’

and 'On amending the Code of Administrative Offenses of Ukraine,' which simplify the procedure for extending the period of stay in Ukraine for foreigners and stateless persons who have legally entered and stayed in the territory of Ukraine, as well as the procedure for replacing a temporary residence permit in the territory of Ukraine (Ukrinform, 2021).

Ukraine has attracted Belorussian IT workers not only by introducing the above-mentioned amenities, but also with a number of other benefits (Belarustoukraine, 2021):

- access to the 4G network;
- average monthly salary in the IT industry – 2300 USD;
- the presence of Top-5 IT companies;
- execution of the state digitization process;
- no language barrier;
- competitive prices for the lease of an apartment or office;
- presence of 5600 service and technology companies on the Ukrainian market.

Among other advantages of Ukraine, employees of the Belorussian IT sector have mentioned (Investment, 2020):

- favourable taxation of business;
- well-developed IT infrastructure in Ukrainian cities and a favourable ecosystem, *i.e.* the existence of IT clusters, IT associations, and the interest of the Ministry of Digital Transformation in developing the industry.

In Ukraine, the development of the 'digital state' continues, the embodiment of which is to be the 'Dia City' project, *i.e.*, a business zone, whose residents will be granted numerous preferences in digital business development: special tax regime for companies and employees, simplified state regulations, unique digital services, the possibility of applying some regulations of so-called British law, a supervisory board composed of residents of the business zone, special conditions for currency regulation and simplified regime of currency settlements.

The project has a very ambitious goal: to increase the Ukrainian IT market from 6.2 to 11.8 billion USD and the number of jobs to 450 000 by 2025. The main goal of the project is to create a Ukrainian IT product able to compete with Western countries.

Lithuania

Lithuania is a member country of the EU, NATO, and OECD. Danske Bank has set up its main IT centre in Lithuania, employing over 4 000 specialists. Tech giants like Uber, Unity, and Wix.com are expanding their systems, and big industry players like Wargaming and EPAM Systems will expand in 2021. Lithuania holds third place among the lowest corporate income tax countries in Central and Eastern Europe. It grants 0% profit tax in Free Economic Zones. A company can be registered here in one day with an electronic signature. Moreover, Lithuania holds the first place in the world for public WiFi speed and ranks ninth globally in 4G availability, fourth in cybersecurity, as well as fourth in the EU for digital public service offer for enterprises.

The Lithuanian labour market is struggling with a shortage of qualified specialists, especially in the field of IT, which is why specialists from Belarus are welcome to fill this niche (Baltic-course, 2020). In this competition for the Belorussian IT sector, Lithuania's main competitors are Poland, Latvia, and Ukraine. The latter offers little expenses but has serious problems with the business sphere. Poland and Latvia offer similar conditions to Lithuania, therefore 'soft' factors prevail city life conveniences, a harmonious migration and integration process, the presence of investment-attracting structures (Trusiewicz, 2020). Lithuanians admit that Poland has one distinct competitive advantage in this respect: the language. Many Belorussians speak Polish and hold the Pole's Card, which greatly facilitates work and life in Poland. Therefore, Lithuanians are looking for other incentives. The entity supporting the Belorussian IT sector in relocation is Invest Lithuania, offering a simplified procedure of quick relocation and investment, eliminating excess paperwork, simplified visa issuing procedure and employee qualification requirements.

Latvia

Latvia is a member of the EU, NATO, OECD, and the World Trade Organization. A company can be registered here within one day; the majority of employees in the ICT sector are (at least) trilingual, speaking Latvian, English, and Russian. Daugavpils, the second largest city in Latvia with more than 80,000 inhabitants, is a four-hour drive from Minsk, the capital of Belarus. On the other hand, Riga, the third largest city in Northern Europe and the largest Baltic metropolis can be reached by car in six hours. Latvia is home to the largest ICT centre in the Baltic States, with over 6500 companies and 40,000 employees. ICT turnover in 2019 amounted to EUR 3.7 billion and represents 4.3% of GDP. In 2019, Latvia had the 16th fastest Internet in the world. Approx. 70% of start-ups established in Latvia are related to FinTech. Working in Latvia is also easy as the country ranks 19th in the world for ease of doing business (Doing Business, 2021) and 16th in the world for ease of paying taxes, making it easier for new and existing businesses to launch and scale. More than 75,000 Belarusians live in Riga, and several large Belarusian enterprises operate there. Thanks to community centres, schools, and cultural groups, Belarusian culture can be studied and maintained in a tightly-knit community.

In cooperation with the Office for Citizenship and Migration (OCMA), the Latvian Investment and Development Agency (LIAA) set up a special team to process visa applications from Belarus more quickly. Visas and residence permits available to Belarusians under the accelerated LIAA programme include entry visas for founders of innovative and scalable enterprises and their families, the EU Blue Card for highly qualified workers and their families, and a temporary visa, *i.e.* a residence permit for people who do not meet the first two requirements.

Latvia is encouraging the best minds of the Belarusian high-tech sector to relocate, offering easier-to-obtain visas, less bureaucracy in opening bank accounts, and special incentives for start-ups. The Latvian IT industry expects the arrival of Belarusians with mixed feelings. On the one hand, the industry is concerned that the privileges offered to newcomers are disrupting market relationships. On the other hand, they are strongly motivated to recruit the most talented employees thanks to the earnings as in Latvia the salaries of IT specialists are more competitive than in Belarus.

Estonia

Estonia is the country with the greatest digital opportunities worldwide. In total, 99% of financial transactions are digital. Electronic ID and Blockchain are widely used in FinTech applications. Over 80 fintechs, from innovative start-ups such as TransferWise to Guardtime, the leader of blockchain, make Estonia a global centre of excellence for fintechs. It is the most cybersecurity-advanced country in Europe, with unique knowledge on R&D and management of cybersecurity solutions and systems. Home to NATO, CCDCOE, Guardtime, and Malwarebytes, Estonia is trusted for the security of the digital economy.

In Estonia, there are no nationality exceptions in the visa application process under the Foreigners Act.

Poland

Poland has launched a special information service for the programme Poland: Business Harbor whose coordinators are GovTech Polska in the Chancellery of the Prime Minister, the Ministry of Development and the Polish Investment and Trade Agency, in cooperation with the Polish Agency for Enterprise Development and the Startup Hub Poland Foundation. The programme is aimed at three groups of beneficiaries: freelancers, *i.e.*, individuals who want to move, start-ups, and enterprises. As part of the path for freelancers, regulations are being proceeded to allow Belarusians to set up a business in a much easier way. This is not a typical course of action for immigrants of other nationalities; it is an offer prepared especially for the needs of activating Belarusians. The path for start-ups includes individual help to efficiently transfer their business operations to Poland. The programme is coordinated by the Startup Hub Poland Foundation as a partner of Poland: Business Harbor. The path for enterprises is a programme coordinated by the Polish Investment and Trade Agency. Currently, software houses, as well as other IT companies interested in placing job offers on the project website through which Belarusians interested in working in one of the listed companies can apply directly. Poland has also prepared a special offer for families of IT employees who decide to work in our country. It covers not only visa matters, but also the

possibility of employment, setting up a business, and additional hours of the Polish language at school for the youngest family members. The 'special treatment' programme has also been implemented, *i.e.* as part of the government's cooperation with the Polish Hotel Holding (Gliwa, 2020), those ready to move to Poland can get accommodation on preferential terms (PAIH, 2020).

Apart from Estonia, each of the analysed countries creates a favourable environment to attract specialists from the Belorussian IT sector. According to GovTech (GovTech, 2021), after half a year of the programme Poland: Business Harbor encouraging the local strong IT sector to relocate, the percentage increased to 43%. Approximately 7% of the entire sector of Belarus has already moved to Poland, supporting the national economy and meeting the growing demand of Polish companies from the digital sector. At the same time, for almost two-thirds of IT specialists considering leaving Belarus, Poland has become the first choice, far ahead of other countries. Approx. 15% of IT specialists went to Ukraine, which ranks second, and approx. 10% to the third country in the ranking, Lithuania. Preliminary research conducted in 2020 showed that Ukraine could be very popular among Belorussian IT specialists. In early 2021, a study of the 'IT in Belarus' portal on the emigration of employees of the Belorussian IT sector was published, which indicated that Poland became the main destination for the emigration of Belorussian specialists. The research also indicated that by April 2021, 15% of IT specialists could have left Belarus.

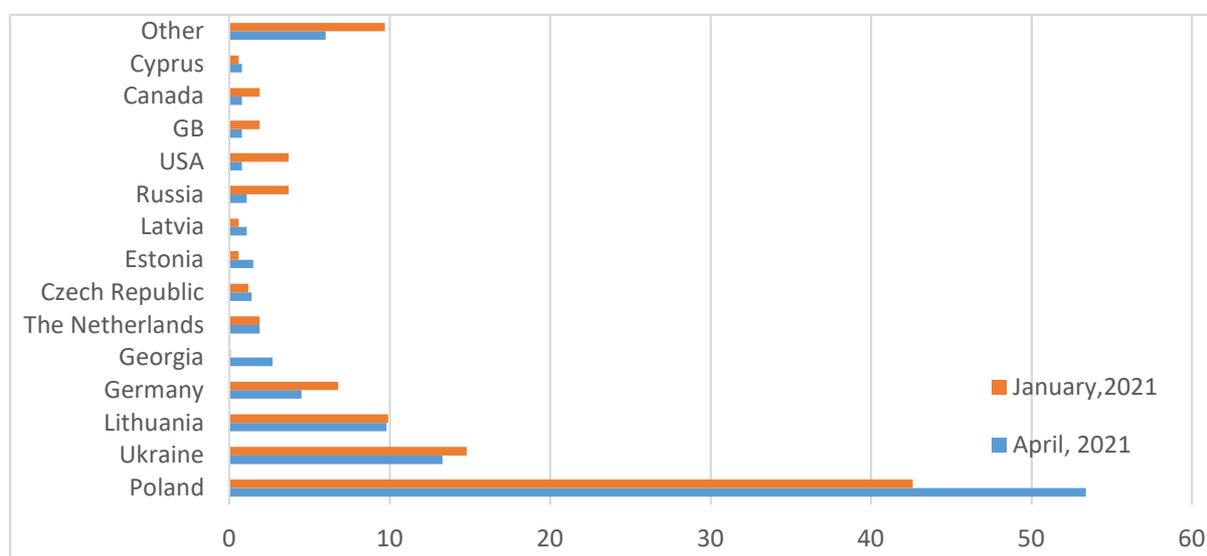


Figure 3. Purpose of trips by country, in %

Source: April, 2021.

It is also noteworthy what kind of specialists leave Belarus. It turns out that IT is senior specialists who most willingly leave the country, which could not be a good prognosis for the IT sector in Belarus. At this point, it should be emphasized that these highly skilled professionals can be valuable employees in migrant destination countries.

When asked about a possible return to the country, the respondents provided very interesting answers. Approx. 33% of IT specialists have not yet decided if and when to return to Belarus. One-third of specialists who left do not exclude the possibility of returning, but on condition that the situation in the country returns to normal. Most respondents in this category are ready to wait no more than a year or two for normalization. Four said they would return anyway as they feel uncomfortable abroad. Finally, 30% will not come back at all. These data show how important political conditions are for the economy, in particular when it comes to a very innovative sector such as IT.

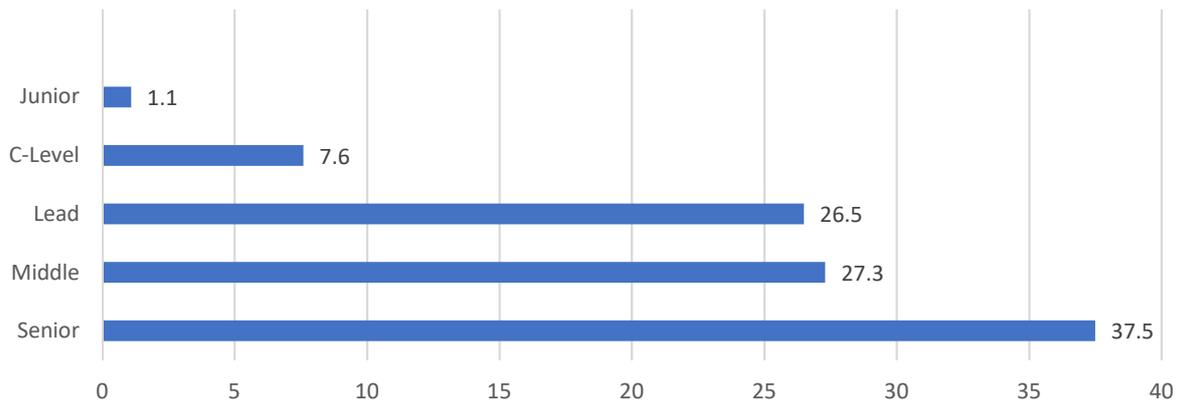


Figure 4. Type of IT specialists leaving Belarus, in %
Source: April, 2021.

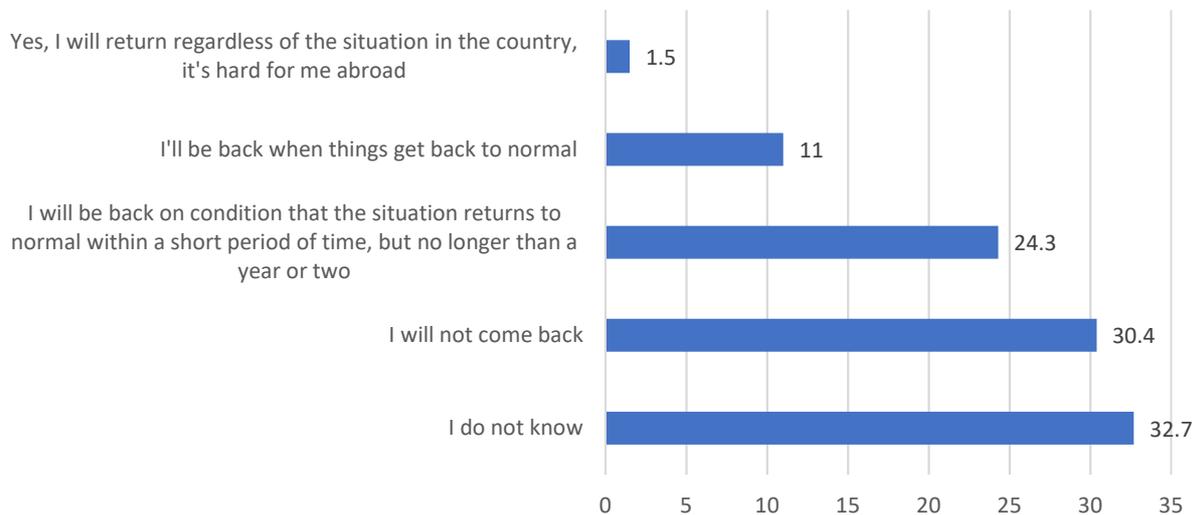


Figure 5. Planned returns, in %
Source: April, 2021.

CONCLUSIONS

The political crisis in Belarus is an opportunity for the IT industry in the post-communist countries of Central and Eastern Europe. Attracting experienced professionals and technologically advanced companies can help in the development of hi-tech, as well as increase the innovation and economic competitiveness of the analysed countries. The potential of these markets is huge.

Google announced that it intends to invest up to 2 billion USD in the Google Cloud region in Poland. Microsoft is also interested in Poland; the American company announced a year ago a comprehensive investment plan worth 1 billion USD, the aim of which is to accelerate innovation and digital transformation for the development of the Polish Digital Valley. This is only one of the many examples of interest in Poland among international corporations, but it certainly demonstrates how big a chance for development the Polish IT sector has.

Both surveys and the current migration flows of the immigration preferences of Belarusian IT sector employees indicate that they are looking for stable markets with good development prospects. At the same time, these studies indicate that cultural proximity and simplified procedures could be among the most important factors when it comes to immigration destination choices. The challenge for future research is the question of the stability of these choices and whether, *e.g.*, the

destinations of current migrations are permanent, or whether the migrants will not move on to the countries of Western Europe.

The aim of the manuscript was to analyse the status of IT specialists in the labour market of selected post-communist countries: Belarus, Poland, Lithuania, Latvia, Estonia, and Ukraine. The interest of the countries neighbouring Belarus in the process of encouraging Belarusian IT specialists emigrating from their homeland has been confirmed. The manuscript has demonstrated that employees of the Belarusian IT sector are an important resource that can compensate for the shortages of specialists in the labour market of selected post-communist countries, such as Poland, Lithuania, Latvia, Estonia, and Ukraine. Belarusian IT specialists are highly qualified, which can improve the competitiveness and innovation of the host economies. Moreover, the data indicate that the most valued specialists were those leaving the country. At the same time, relocations of Belarusian companies to neighbouring countries were observed, as well as an increase in self-employment in the markets of selected post-communist countries, in which Belarusian workers play an active role.

Each study is also associated with certain limitations that affect the presentation of the results; therefore, some generalizations and incompleteness of the data used are unavoidable. To ensure the same level of publication, we limited our research to systemic instruments created by selected post-communist countries to attract IT specialists from Belarus.

It seems that the next areas of research could be topics related to the observed migration of IT specialists from countries affected by the Russia-Ukraine war, as well as from Belarus (which is indirectly involved in this conflict).

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