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APPLIED GOVERNMENTS' STRATEGIES FOR BRAIN DRAIN PREVENTION

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Abstract

Currently, many countries are facing the issue of outmigration of highly skilled workers. Based on different strategies and policies, this paper proposes a regulatory framework for brain drain. In this article, we focus on the formats and support instruments through strategies and government policies, followed by their critical assessment. The methodology, based on the review of relevant literature, aims to reflect the academic discourse regarding the issue of brain drain and, particularly, the goal of return migration. Diverse strategies are presented, ranging from financial approach to technology parks, innovation hubs, and talent markets. Moreover, the problems caused by migration, such as brain waste, are investigated. The investigation is based predominantly on European strategies. Future research could precisely focus on the application of strategies adopted and tested by a different country where positive results have already been detected. This work could serve as a stepping stone for the investigation of this phenomenon, the subsequent analysis of strategies and future impact.

Key words

brain drain, governments' interventions, regulation, prevention.

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1. Introduction

Currently, many countries are facing the issue of emigration of highly skilled workers. This phenomenon is often referred to as "brain drain". It causes not only economic losses, but also social one, from both a society-wide and a business perspective. However, these negative effects only concern permanent migration. In the case of temporary migration, it is possible to talk of an opposite effect, "brain gain", i.e. if qualified workers return to their country of origin after a certain period of time, they usually bring

know-how and gained experience. This leads to the appreciation of human capital.

D. Guellec and M. Cervantes (2002) as well as R. Daugėlienė and R. Marcinkevičienė (2009) used the term "knowledge economy" or "knowledge-based economy era" to designate the trend when economy is increasingly dependent on highly qualified persons. Human capital is a supply of skills and talents, which is reflected in the educated and qualified workforce in a region (Čuhlová, Potužáková, 2017).

With skilled workers, the investment in their education also moves abroad (economic losses of the country) and, simultaneously, these people leave the local labor market (loss for employers). In some countries, the brain drain phenomenon causes considerable difficulties because a large number of young and usually educated people emigrate.

For many years, scientists and governments have been working on strategies to bring back both highly qualified workers and students. An overview of brain drain strategies used around the world and their implications is crucial. "Government policies alone rarely cause people to return, but they certainly do contribute to the decision" (Zweig, 2006, p. 67).

Based on different strategies and policies, this paper proposes a regulatory framework for brain drain. There is an intense debate concerning ways to help; who is actually benefitting or, on the contrary, who is overlooked in this process. In this article, we focus on the formats and instruments of support through strategies and government policies, followed by their critical assessment. The methodology, based on the review of relevant economic literature, aims to reflect the current academic discourse regarding the issue of brain drain and particularly the goal of return migration.

Research questions: Which strategies are successful for brain drain prevention? What disadvantages might these strategies and government policies face?

Firstly, this work includes a broader context regarding the regulation issue and the phenomenon, particularly in the OECD countries. Next, we list governmental interventions and strategies of various states encouraging the return of their citizens or their engagement in international activities, which however does not cause their permanent departure. This review is mostly based on the strategies of the following authors: M. Cervantes (2005), R. Čuhlová and Z. Potužáková (2017), R. Daugėlienė and R. Marcinkevičienė (2009), H. Lipovská and J. Fisher (2015), A. Muthanna and G. Sang (2018), L. Semiv and Y. Hvozdo vych (2012) and D. Zweig (2006). Later, a discussion of gained knowledge and diverse approaches of selected countries follows.

2. Governments' interventions

We mentioned the ideal and desirable state of the economy, i.e. the knowledge economy. The workforce is "upskilling" both in terms of the average level of education of workers and in terms of the diversity of employment types. Employment growth is supported by white-collar and highly qualified workers.

Without this workforce, neither states nor businesses can properly develop and innovate. This regards not only specialized sectors focused on knowledge, but work is increasingly qualified across sectors and across occupations (Pont, 2001).

In general, a profession can be described by the following characteristics: it requires a specific skill, partially or fully developed through academic training, and provides a service requiring a high degree of integrity. Some professions, particularly lawyers, doctors, pharmacists, notaries and architects, seem to be relatively highly regulated (Garoupa, 2011).

In the 1980s, independent regulators began to employ new regulatory techniques, including more precise rules. Statute law used to have a limited role, while self-regulatory rules were created by professional associations throughout Europe. At present, state intervention by governments and competition authorities has redesigned the regulatory background for professions across Europe (Garoupa, 2011). "These requirements of education (a specific diploma) and traineeship may be determined by both the government and the professional body" (Garoupa, 2011, p. 460). It is, therefore, a matter of regulating education that these conditions and their enforcement are balanced, or better outweighed, by revenue and overall social welfare (Garoupa, 2011).

Within the EU, these measures are softened; education is recognized between countries, making it easier to move from one member state to another. Therefore, there is a greater space for the creation of the brain drain phenomenon.

2.1. General framework in the OECD countries

Numerous studies explore the brain drain phenomenon (Freeman, 2006; Petroff, 2016). Central and Eastern European countries strongly affected by this problem include, for example, Slovakia (Lipovská, Fischer, 2015) and Poland (White, 2010), but also Ukraine (Semiv, Hvozdo vych, 2012). However, the most affected countries are in Southern Europe, e.g. Portugal (Heitor et al., 2014), Greece, but also Spain and Italy (Bartolini et al., 2017). In Northern Europe, especially Lithuania is trying to tackle this issue (Daugėlienė, Marcinkevičienė, 2009).

OECD (2015) clearly maps the distribution of highly educated migrants by region of origin according to the grouping of states. Migrants in the OECD countries became more educated between the years 2000–2001 (7.5 mil.) and 2010–2011 (11 mil.). In 2010–2011, 11 million migrants in OECD countries (27% of all migrants) were highly educated and coming from non-OECD countries – 777,000 (35%) (OECD, 2015).

Furthermore, a significant growth in the structure of educated migrants can be seen in the OECD countries. According to R. d'Aiglepieire et al. (2020), the share of immigrants in the total population and immigrants with tertiary education in specific countries is following: about a half of OECD countries have a very small difference between the share of immigrants with tertiary education in the total population and among the tertiary educated people. For some key destinations (the US, Germany, France, etc.), there is a negative difference. However, there are some countries, where the share of foreign-born among the tertiary-educated is significantly higher than in the total population. These countries are, for example, Luxembourg, where 63% of those with tertiary education are foreign-born, which is more than in the total population (d'Aiglepieire et al., 2020).

Table 1 shows the top 4 countries of residence of immigrants with tertiary education and, for an overview, it presents the same data for Central Europe and Germany, as for the neighboring countries of the Czech Republic (incl.).

We can notice top corridors towards OECD countries in 2015–2016 (d'Aiglepieire et al., 2020). When it comes to the distribution of tertiary-educated people, some countries exhibit a very low share (MEX–USA 7%), but other corridors connecting Asian countries to the USA are showing a major share (IND–USA approx. 80%; Korea–USA and Philippines–USA 60%). The main destinations for the highly educated in 2010–2011 were the United States, the United Kingdom and Canada (together 62% of highly educated migrants in the OECD) (OECD, 2015).

Certainly, COVID-19 has had a major impact on migration flows, but in past years, an increasing trend was registered. One of three immigrants coming to OECD countries holds a tertiary degree. Generally, international students came from Asia (6 out of 10) and from Europe (approx. "2.5") in 2018 (OECD, 2020).

The number of highly qualified foreigners in the Czech Republic has steadily increased since 2003 (Czech Statistical Office, 2019). It is a result of the ongoing establishment of branches of Western companies in the Czech Republic, which began in the 1990s. Another impact is the growing attractiveness of the Czech Republic due to the rising standard of living. In 2018, a total of 44,846 foreigners, mostly from the EU, studied at Czech universities (particularly from the following countries: Slovakia – 21,292, Germany – 829, UK – 547). Outside the EU, mostly students from the Russian Federation (5,782) and Ukraine (3,347) studied in the Czech Republic (Czech Statistical Office, 2019).

2.2. Governments' interventions for brain drain prevention

One of the best strategies, especially for young researchers and teachers, is funding their research through grants and scholarships. These opportunities are offered, for example, by programs such as Marie Curie Actions, EURECA, TEMPUS–TACIS, and others (Cervantes, 2005; Daugėlienė, Marcinkevičienė, 2009; Muthanna, Sang, 2018; Semiv, Hvozdo vych, 2012).

Due to the adoption of the Bologna Process many countries are facing brain drain. This has expanded opportunities for personal development, strengthened cooperation between institutions and researchers at an international level, as well as improved universities and research activities. Such an opening of borders and opportunities caused the mentioned brain drain, paradoxically affecting students who were allowed to go abroad to study. The study is usually the first step towards emigration from one's home country (Semiv, Hvozdo vych, 2012).

According to R. Daugėlienė and R. Marcinkevičienė (2009), in Lithuania, especially students consider the possibility to migrate (almost 90% of the

Tab. 1. Country selection and number of immigrants 15+ in OECD countries, 2015–2016

Country of residence (OECD)	Foreign-born population 15+ (thousands)	Tertiary educated (%)
Canada	7,738	59.5
Israel	1,744	49.3
Australia	5,791	47.4
Luxembourg	228	45.8
Czech Republic	415	29.4
Austria	1,494	25.9
Germany	12,011	21.7
Poland	565	21.2
Slovakia	160	20.9

Source: own processing according to R. d'Aiglepieire et al. (2020, p. 17).

respondents), then managers (40%). The case study also examines foreign students in Kaunas universities, where approx. 70% do not want to stay in Lithuania. Lithuanian students deem the creation of international centers or technological parks important. Also, answers of foreign students reveal a solution in the increase of state funding for highly skilled professional activities.

H. Lipovská and J. Fisher (2015) also analyzed the degree of brain drain when it comes to students, but this time from Slovakia. They created a profile of students who come to the Czech Republic to study and tend to stay there. Only 6% of Slovak doctoral students are considering returning to Slovakia. Slovakia is fighting against brain drain with the Ministry's strategy, specifically through a grant program "Home-coming" which offers scholarships (Lipovská, Fisher, 2015).

Taking into account the above-mentioned data (2.1), we could assume that the Czech Republic has no problem attracting foreign specialists. So how does the Czech Republic approach this issue and what strategies and policies are in place to attract not only its citizens back, but also foreign workers to the country?

Many countries, such as the Czech Republic, Hungary, Estonia (Semiv, Hvozdo vych, 2012), use the national reform program to encourage the process of returning of their citizens. For example, in the Czech Republic, there are particular migration programs according to which the government approves the incoming applications (Government of the Czech Republic, 2020). The migration program prioritizes (with decreasing importance) highly qualified employees, key and scientific staff, and qualified employees. Migrants belonging to these programs can apply for a long-term residence permit. Their countries of origin are usually in a very difficult position with regard to attracting citizens back.

Every country has a different approach to entrepreneurs and especially young people, as these are more and more interested in start-ups. Therefore, one of the strategies to help starting entrepreneurs and to create attractive places are Innovation Hubs (European Court of Auditors, 2014), Digital Innovation Hubs (Government of the Czech Republic, 2020) or High Technology parks (Daugėlienė, Marcinkevičienė, 2009). Under the Digital Europe program, Digital Innovation Hubs are helping particularly small or medium-sized enterprises by building an international network of the mentioned hubs (Government of the Czech Republic, 2020). Non-profit organizations are members of these hubs, focusing on the promotion of digital skills and knowledge.

Policies are often related to innovations and the creation of a new talent market for emigrant citizens (Zweig, 2006; Semiv, Hvozdo vych, 2012). But, first of all, the country has to have or "create" highly qualified workers as a foundation for such talent markets. They have to start with increasing investment in higher education. In China (Zweig, 2006) and other Asian countries (Daugėlienė, Marcinkevičienė, 2009), the Government invested millions of dollars in the creation of world-class universities through, in the case of China, their nine already established universities.

A major impact is generated by the information flow between scholars abroad and organizations in China in new magazines or websites (Zweig, 2006; Semiv, Hvozdo vych, 2012). They also established Service Centers and Investment Affairs Department which may be construed as the Innovation Hubs in the Czech Republic (European Court of Auditors, 2014). According to Zweig's interview (Zweig et al., 2004), these successfully transformed government policies have had a particularly great influence on the scientists' decision to return to their home country.

Information flow or connection is crucial, as claimed by L. Semiv and Y. Hvozdo vych (2012). When it comes to knowledge migration, it is necessary to find ways to retain specialists by outsource, offshore or overseas consultancy. This is especially important in regard to the ICT field. On the other hand, to attract foreign specialists, scientific programs on a grant basis are the answer. The same strategy for ICT field and R&D is supported by M. Cervantes (2005).

Other recommended policies are mostly related to law: changing universities' autonomy at the level of international cooperation and mobility, simplifying the visa system for researchers, and the accreditation of diplomas abroad (Semiv, Hvozdo vych, 2012). Not only visas but overall a simplified process of entry for highly qualified workers and investors could be put in place (Cervantes, 2005; Daugėlienė, Marcinkevičienė, 2009).

D. Zweig (2006) also focuses on strategies and thus on specific policies implemented by the Chinese government. Different government authorities, such as the State Education Commission, the Communist Party or the Ministry of Personnel have shifted many strategies over time. Practical strategies have been introduced chiefly since 1992. For example, a recent policy includes the following steps: career centers for returning students, providing living spaces, allowing families to change residence to join their returning members, assisting with job search in China, increasing support for research and others.

3. Discussion

For every country, it is necessary to collect and analyze data. After that, the government and universities will be capable of determining priorities and accordingly allocate resources to the main research areas. Moreover, such new funding programs and extensive government efforts fit well with the growing interest of many people in returning to their countries of origin.

China (Zweig, 2006) was confident in the statement that it is more important to attract Chinese emigrants than foreign workers to China. The country employed slogans and ideas such as: "building national strength through science and education" and "strengthening the country through human talent" (Zweig, 2006, p. 70). That is why the Chinese government mobilized even their people overseas to help their country abroad through many international projects (Zweig, Chung, 2004). This cooperation can also be used like lectures thanks to short-term visits where the country still benefits from this new policy.

Some of the main strategies to attract highly qualified workers are related to finance. These include a more suitable taxation system, solving housing problems or adequate salary, to name a few. But is it fair? In China (Zweig, 2006), these practices reveal issues among non-migrants like the favoritism of "outsiders" or the overemphasis on returnees.

In 2002 and 2004, interviews were conducted with academics and scientists from the Chinese Academy of Sciences (Zweig, 2006). Their aim was to reveal views of both locals and returnees on the government policy towards returnees. Questions regarding the overemphasis on returnees or the alleged returnees' higher quality of life (i. e. funding, housing, etc.) were obvious (on average, 16% of local academics agreed against 3% of returnee academics). Differences were also noted among scientists (Zweig, 2006). On average, 27% of local scientists were dissatisfied with housing, funding, promotions, etc. compared to the benefits received by returnee scientists.

Based on these interviews (Zweig, 2006), we prove that concerns about unfair treatment are legitimate. Beside complaining about housing, one local PhD declares: "the State had failed to promote its home-grown talent because of its excessive concern with returnees. (...) bringing in overseas talent was a sound policy, it was (also) demoralizing for locally trained scholars" (Zweig, 2006, p. 85).

So how should the government behave? Do returnees really deserve such attention and privileges, when those who stayed "at home" have contributed with their knowledge to the country's development

all their lives? First and foremost, a system should be devised to provide equal opportunities for both those who do not consider migration and those who are considering it. Of course, there is a big difference between political and financial reasons behind migration. Another criterion should be an assessment of the "quality" of returnees, what experience they bring to the country and to which area? How can the country deal with them? Is such an investment worthwhile in someone who, for example, spends most of his productive life abroad? People who stay at home do not only contribute financially to the state throughout their lives, and thus should have equal rights and opportunities.

Many authors have addressed factors that can affect both brain drain and brain gain. More specifically, they focused on what makes people return or what makes them leave. In other words, we refer to these as push and pull factors (Gibson, McKenzie, 2009; Eftimov, Ristovska, 2019). According to L. Semiv and Y. Hvozdoanych (2012), immigration of young Ukrainians is prompted mainly by pushing factors which are dominant over pulling factors. The push factors motivating the departure of young Ukrainians with a university degree and scientific or innovative prospects include: mainly high unemployment in the country, negligible job opportunities in terms of specialization, lack of material and low technical level of scientific research, as well as income inequality, institutional barriers or insufficiently innovative infrastructure.

In order to improve innovative infrastructure, we suggest the above-mentioned Innovation Hubs as an appropriate strategy even with a narrower focus. Issues may arise as a result of financing failure, in particular limited helping procedures or limited follow-up assistance to start-ups. Nevertheless, several problems were also confirmed in the European Court of Auditors' audit (2014), which found that very little attention was paid to the effectiveness of business support functions or that monitoring systems did not provide sufficient management information.

Another approach which many countries adopt to deal with brain drain and which we have mentioned above is based on grant programs. However, not every grant program achieves equally "good numbers". In Slovakia, only a third of targeted students returned to the country (Lipovská, Fischer, 2015). The government has to improve not only at the financial level, but also other levels need to be considered. We all know that brain drain for one country means brain gain for another. In this case, it is mainly the Czech Republic which benefits from this Slovakian loss. When Slovakia adopts new measures and policies, the Czech Republic will face

a similar problem. It would be good to think about a consensus between these states. But what are actually the chances of Slovaks leaving the Czech Republic? Apart from the higher standard of living of Slovaks in the Czech Republic, they do not have to deal with a language barrier, they are not perceived as migrants in a negative way and they are close to their families. Consequently, we think that in the case of studying in the Czech Republic, there is a small chance of returning to their home country. Slovakia should thus consider transforming its education system.

Grant programs offering the possibility of international cooperation represent a great opportunity for doctoral students and scientists. Between 2000 and 2010, the growth rate of scientists' cooperation in Ukraine doubled (Semiv, Hvozdo vych, 2012). As opposed to the desired effect, these temporary opportunities can be perceived as a "ticket" out of these types of countries. After coming back, researchers can realize their dissatisfaction with low income, the quality of life, and technical and scientific resources. Therefore, they often pursue other international opportunities.

Related to the rejection of non-EU diplomas in the EU, another, quite unfamiliar, issue arises, the so called brain waist (Anghel, 2019; Nakamuro, Ogawa, 2010; Semiv, Hvozdo vych, 2012). Failure to use the acquired knowledge and skills in their country will often force young people to go abroad. However, their diploma will not help them there, so they will often have to do menial work, but still for a higher salary than they would receive in their country. It may happen that returnees forget their knowledge or do not develop it at the very least. Thus, in case of returning to their homeland after a long time, they do not represent such a contribution. But again, we return to financial strategies, which even here seem to be the best solution for retaining workers in their country. Such strategies can be complemented by frequently used work-life-balance benefits.

These countries have very limited state funding (Semiv, Hvozdo vych, 2012). That is the reason why all financial support, for innovative or technological infrastructure and the launch of world-class universities, is very difficult. One of possible actions to accumulate more money for the mentioned policies is regulation, for example, of gambling or a change of taxation.

Some authors and specialists (Zweig, 2006; Semiv, Hvozdo vych, 2012) also recommend a new way of communication with migrants, such as the creation of websites, migration networks, virtual research centers or specialized centers where migrants can

find helpful information about the labor market, vacancies, internship offers, etc.

4. Conclusion

Each country must find the right approach to succeed when it comes to attracting and assembling highly qualified people, which may lead to the establishment of a knowledge-based economy era.

R. Daugėlienė and R. Marcinkevičienė (2009) summarize the goals of strategies on different continents. While Asian countries try to compete for professionals through venture capital and the creation of world-class universities, European countries try to reduce cultural barriers.

In our article, we focus on the formats and instruments of support based on strategies and government policies, followed by their critical assessment. Future research could focus precisely on the application of diverse strategies adopted and tested by a different country, where positive results have already been registered. Next, researchers may draw inspiration from new approaches or possibly avoid their shortcomings. Considering other possible outcomes, this work could serve as a stepping stone for the investigation of the brain drain phenomenon in a specific country and the subsequent analysis of employed strategies and future impact.

Limitations of this study lie in the fact that it investigates only some countries and their particular strategies. Not all strategies are applicable to other countries, which have specific requirements and thus specific solution approaches. Nevertheless, we assume that the employed selection of strategies of certain countries presents a good start for other countries, which have not yet begun to deal with this phenomenon, or their present strategies are not working.

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References

- Anghel O.I., 2019, Problems Generated by Poor Support of Young Talented People, *Review of Artistic Education*, 18(1), 287–292. doi: 10.2478/RAE-2019-0032

- Bartolini L., Gropas R., Triandafyllidou A., 2017, Drivers of highly skilled mobility from Southern Europe: escaping the crisis and emancipating oneself, *Journal of Ethnic and Migration Studies*, 43(4), 652–673. doi: 10.1080/1369183X.2016.1249048
- Cervantes M., 2005, Attracting, Retaining and Mobilising High Skilled Labour, [in:] OECD, *Global Knowledge Flows and Economic Development*, OECD Publications Service, Paris, 51–71. doi: 10.1787/9789264107687-4-en
- Čuhlová R., Potužáková Z., 2017, Highly qualified in the Czech Republic, *Journal of International Studies*, 10(1), 159–172. doi: 10.14254/2071-8330.2017/10-1/11
- Czech Statistical Office, 2019, *Foreigners in the Czech Republic – 2019: 4–8. Universities – foreign students*, <https://www.czso.cz/csu/czso/4-vzdelavani-cizincu-00hvg097q7> (accessed 13 May 2020).
- d'Aiglepierre R., et al., 2020, A global profile of emigrants to OECD countries: Younger and more skilled migrants from more diverse countries, *OECD Social, Employment and Migration Working Papers*, 239, 1–41. doi: 10.1787/0cb305d3-en
- Daugėlienė R., Marcinkevičienė R., 2009, Brain Drain Problem in Lithuania: Possible Actions for its' solution via Brain Gain, *European Integration Studies*, 3, 14–22.
- Eftimov L., Ristovska A., 2019, The Role of Human Resource Management in Retaining Talent: Empirical Analysis of Youth in the Republic of North Macedonia, *Dynamic Relationships Management Journal*, 8(1), 29–39. doi: 10.17708/drmj.2019.v08n01a03
- European Court of Auditors, 2014, *Has the ERDF successfully supported the development of business incubators?*, Publications Office, Luxembourg. doi: 10.2865/31610
- Freeman G. P., 2006, National models, policy types, and the politics of immigration in liberal democracies, *West European Politics*, 29(2), 227–247. doi: 10.1080/01402380500512585
- Garoupa N., 2011, Regulation of professions, [in:] D. Levi-Faur (ed.), *Handbook on the Politics of Regulation*, Edward Elgar Publishing, Cheltenham, 453–468.
- Gibson J., McKenzie D., 2009, The microeconomic determinants of emigration and return migration of the best and brightest: Evidence from the Pacific, *Institute for the Study of Labor (IZA – Discussion Paper series)*, 3926, 4–54. doi: 10.1016/j.jdeveco.2009.11.002
- Government of the Czech Republic, 2020, *National Reform Programme of the Czech Republic*, Government of the Czech Republic, Prague.
- Guellec D., Cervantes M., 2001, International mobility of highly skilled workers: From statistical analysis to policy formulation, [in:] *International mobility of the highly skilled*, OECD Publications Service, Paris, 71–98.
- Heitor M., Horta H., Mendonça J., 2014, Developing human capital and research capacity: science policies promoting brain gain, *Technological Forecasting and Social Change*, 82, 6–22. doi: 10.1016/j.techfore.2013.07.008
- Lipovská H., Fischer J., 2015, Brain Drain – Brain Gain: Slovak Students at Czech Universities, *Journal in Efficiency and Responsibility in Education and Science*, 8(3), 54–59. doi: 10.7160/eriesj.2015.080301
- Muthanna A., Sang G., 2018, Brain Drain in Higher Education: Critical Voices on Teacher Education in Yemen, *London Review of Education*, 16(2), 296–307. doi: 10.18546/LRE.16.2.09
- Nakamuro M., Ogawa K., 2010, Mobility of skilled labor in transition economies: The perspectives from brain–drain, brain–waist, brain circulation and brain gain, *Journal of International Cooperation Studies*, 18(1), 71–84.
- OECD, 2015, *Connecting with Emigrants: A Global Profile of Diasporas 2015*. OECD Publishing, Paris. doi: 10.1787/9789264239845-en
- OECD, 2020, *International Migration Outlook 2020*. OECD Publishing, Paris. doi: 10.1787/ec98f531-en
- Petroff A., 2016, Reversing the Brain Drain: Evidence from a Romanian Brain Networking Organization, *International Migration*, 54(5), 122–135. doi: 10.1111/imig.12268
- Pont B., 2001, Competencies for the knowledge economy. [in:] OECD (ed.), *Education policy analysis*. OECD Publishing, Paris, 99–118. doi: 10.1787/epa-2001-en
- Semiv L., Hvozdo vych Y., 2012, The intellectual migration of the youth in Ukraine: the backgrounds for “brain circulation”, *Journal of International Studies*, 5(2), 72–81.
- White A., 2010, Young People and Migration from Contemporary Poland, *Journal of Youth Studies*, 13(5), 565–580. doi: 10.1080/13676261.2010.487520
- Zweig D., 2006, Competing for talent: China's strategies to reverse the brain drain, *International Labour Review*, 145(1–2), 65–89.
- Zweig D., Changgui C., Rosen S., 2004, Globalization and Transnational Human Capital: Overseas and Returnee Scholars to China, *The China Quarterly*, 179, 735–757.
- Zweig D., Chung S. F., 2004, *Redefining China's Brain Drain: 'Wei Guo Fuwu' and the 'Diaspora Option'*. Paper presented at The 40th Anniversary Reunion Conference: The State of Contemporary China, The Universities Service Centre for China Studies, The Chinese University of Hong Kong, Hong Kong. January 6–7, 2004.