Ministry of Education and Science of the Republic of Kazakhstan

M. Narikbayev KAZGUU University

«Approved for Defense»

Supervisor: Dr. Saule Kemelbayeva

_____

«__» _____ 20__

MASTER'S THESIS (PROJECT)

Brain drain in Kazakhstan: reasons and consequences.

«*Push factors affecting emigration from Kazakhstan*»

Specialty 7M04122 - «Economics»

Written by Aldiyar Kapyshev

Supervisor Dr Saule Kemelbayeva

Nur-Sultan, 2021

M. Narikbayev KAZGUU University

Brain drain in Kazakhstan: reasons and consequences.

«*Push factors affecting emigration from Kazakhstan*»

Aldiyar Kapyshev

May 13, 2021

«Approved»

Supervisor's First and Last Name: Dr. Saule Kemelbayeva

Supervisor's Signature _____

«__» _____ 20__

Nur-Sultan, 2021

Table of contents

List of figures

List of Appendixes

Abstract

Brain drain in Kazakhstan: reasons and consequences.

«*Push factors affecting emigration from Kazakhstan*»

By Aldiyar Kapyshev, HSE KAZGUU University, May 2021.

This work aims to identify the causes of emigration from Kazakhstan, including intellectual migration also known as brain drain. The relationship between GDP per capita, total unemployment, corruption perceptions index, GINI index, Human Development Index, Voice and Accountability, Rule of Law, Political Stability and Absence of Violence/Terrorism, Government Effectiveness and emigration from Kazakhstan is being examined in the paper. The main purpose of the study is to identify and assess the relationship in the Kazakh labor market and the conditionality of migration decisions among people. To achieve this goal, the following thesis was put forward: due to working conditions in the Kazakhstani market and uncertain political situation, highly qualified workers emigrate to more favorable destinations. Due to the changing nature of work and decline of labor force equipped with necessary skills the functioning of the economic system may be jeopardized. Exodus of young and educated workforce is not only a considerable economic loss, but also it has a societal impact signifying that people are not able to realize their potential in their own countries.

In the frame of the research it was revealed that unemployment and uncertain political situation, violations of rule of law mostly affects the decision to emigrate resulting in a brain drain. Better working conditions and long-term economic stability abroad justify the migration decisions of highly qualified labor in Kazakhstan. In this study, migration is considered as a socio-economic process, from the standpoint of its links with the labor market, the standard of living of the population and other socio-economic and political indicators in Kazakhstan.

Introduction

Emigration and intellectual migration of the population is a complex phenomenon, the characteristic patterns of which are manifested in the continuous increase in the scale, the involvement of the population of almost all countries of the world in the global migration turnover, and the rapid growth of labor migration. The reasons for migration can be different, for example, the result of a person's desire to improve their financial and living situation: salary, housing, education, or working conditions. Labor migration has become a part of international economic relationships. International labor migration is the process of moving human resources from one country to another in order to find employment on more favorable terms than in the country of origin[1]. International migrations of human resources introduce tangible changes to the economic situation, both in the sending and receiving countries, and therefore these changes of a multifaceted nature have become crucial for countries and international organizations. Due to the high exchange rate and continuous devaluation of local currency, working abroad allowed Kazakhstanis to quickly improve their financial situation. However, these types of temporary migrations occurred on a small scale and could only be directed to countries with which Kazakhstan had signed bilateral agreements. In the 1990s, Kazakhstan had a high level of unemployment, which was associated with low wages and, consequently, a lower standard of living[2]. In addition, at present, in Kazakhstan, a common reason for migration is the desire to improve the financial situation. The emigration of Kazakhstanis is not related to the need to find a job, but rather to find a higher-paying job and related to the qualifications of the employee. An increasingly important reasons for Kazakhstanis to emigrate are education, family reunification, and an extensive system of social benefits. In an age of aging societies in most countries of the world, states that are at a higher level of economic development, often within the framework of their own migration policies, seek to encourage immigrants to live more comfortably (easier) in their more developed institutional environment.

It should be emphasized that the reasons for migration can be related to each other and act on the principle of feedback. According to Mukhamedhanova (2015) young Kazakhstanis who initially migrate to the EU

[1] Docquier, F., Lohest, O., & Marfouk, A. (2007). Brain drain in developing countries. 21(2), 193-218

[2] Abazov, R. Central Asia's Skilled Migrants: Brain Drain or Brain Gain?. The Central Asia-Caucasus Analyst, 2010, 9.

for financial reasons, after some time, wishing to expand their professional competencies, receive further education in the territory of the EU countries or seek further employment opportunities.

A disturbing phenomenon that has been observed for several years is the emergence of the so-called brain drain, that is, the departure of young, well-educated people who could not find work in the labor market in Kazakhstan[3]. However, they emigrate because abroad they can get a higher salary for the same job. This is especially true for professional groups such as engineers, IT specialists, economists, doctors or nurses. The emigration of representatives of these professions leads to an increase in the deficit of extremely valuable human capital in Kazakhstan.

In the case of emigration of qualified personnel (also called talents or knowledge workers), whose education is associated with high costs, the state loses an educated person. The reason for leaving is often not only low incomes, but also, most importantly, better working conditions, self-realization and political situation.

The expanding scale of emigration of Kazakhstanis is now an extremely important prerequisite for studying this phenomenon. Without knowledge of the real reasons for the emigration of certain groups of the population, it is impossible to build an effective economic policy aimed at proving favorable conditions for people to succeed in the country. The emigration of highly qualified specialists is a mass phenomenon which is emerging worldwide.

The following thesis was put forward:

Due to unemployment, weak governance and uncertain working conditions like legal protection of employees, arbitrary policies on promotion, absence of effectively functioning labor unions in the Kazakhstan market, as well as uncertain political situation the highly qualified workers emigrate from Kazakhstan. The departure of skilled and educated people from the country is a loss for the state, which has incurred high educational costs and bring benefits for states that accept immigrants.

[3] Teslenko, A. N., Ibrayeva, A. B., & Sh, R. A. Double-diploma education in Kazakhstan as a tool of academic mobility of faculty and students. Sociological Studies, 2017, 141.

The main purpose of the study is to identify and assess the relationship between unemployment, selected economic and governance indicators, political situation, uncertain working conditions in the Kazakhstani market and the conditionality of migration decisions of young people.

The following specific objectives were set for the implementation of the research task:

1. Analysis of student migration in the context of selected theories of economic and migration processes.

2. Assessment of the impact of certain conditions on the adoption of migration decisions by Kazakhstani students.

3. Assessment of the labor market in Kazakhstan.

4. Analysis of the relationship between unemployment in the Kazakhstan market and migration decisions of people.

5. To assess the effects of Worldwide governance indicators introduced by the World Bank on decision to emigrate.

The following research hypotheses were put forward:

Hypothesis 1: high unemployment level and low GDP per capita are emigration determinants

Hypothesis 2: migration decision-making by Kazakhstani students is related to the existence of migration networks of Kazakhstanis working abroad;

Hypothesis 3: better conditions and employment prospects abroad justify the migration decisions of highly skilled workers in Kazakhstan.

Literature review

Definition of "brain drain"

Currently, the concept of "brain drain" or "intellectual migration" mainly describes the processes of departure of scientists and qualified personnel to work outside of their country. However, there is no single meaningful definition of the phenomenon of intellectual migration in the scientific discourse. Researchers usually include cross-border movements of scientific and technical specialists, sometimes including creative intellectuals and students studying abroad as migrants[4]. The broadest interpretation

[4] Carrington, W. J., & Detragiache, E. How big is the brain drain?, 1998, 43.

implies that intellectual migrants are all professionally qualified persons who have been abroad for more than one year. In general, the existing definitions are quite similar in meaning, but taking into account their differences, it is necessary for a more complete understanding of the diversity of migration issues.

According to the established ideas, intellectual migration is one of the directions of global migration processes[5]. In principle, this characteristic is not contradicted by another approach, which defines intellectual migration as one of the most important types of cross-border population movements and, therefore, initially emphasizes its importance in comparison with other social components of migration flows. At the same time, demographers and sociologists often point out that intellectual migration is characterized by cyclical development, which is equally unevenly reflected in the social and political understanding of the migration phenomenon. Such statements seem quite fair, since mass cross-border movements of people with high professional qualifications were observed, for example, during the European religious wars, as well as later, in the twentieth century, during the economic crisis and the onset of the fascist dictatorship, many European scientists, as well as ordinary citizens, left their countries and sought to settle abroad. A large number of studies and even fiction stories have been devoted to these dramatic stages of European history, but the factors, mechanisms, and consequences of intellectual migration in the post-bipolar period have been studied to a much lesser extent[6].

Nevertheless, experts point to a number of typical features that mark modern cross-border movements of highly qualified personnel, and which are independent of the broad or limited definition of their composition[7].

Important for understanding the phenomenon of intellectual migration is, in particular, the statement that the post-bipolar "migration explosion" among high-level professionals is not only different in its scale, but also in its changed causes, as well as in its peculiar forms of manifestation. It is believed that if in the recent past, the main factors determining the desire of people to move to another country were the motives

[5] Docquier, F., & Rapoport, H. Globalization, brain drain, and development. Journal of economic literature, 2012, 684.
[6] Kwok, V., & Leland, H. An economic model of the brain drain. The American Economic Review, 1982, 96.
[7] Skeldon, R. Of skilled migration, brain drains and policy responses. International Migration, 2009, 17.

associated with creative opportunities, today the circumstances of the social environment begin to prevail in comparison with the circumstances within the scientific community as a special segment of society[8].

Another significant outcome of the study of intellectual migration is the turn of research from the consideration of specific issues that reflect the impact of migrants on the country receiving or losing (sending) highly qualified personnel, to a more universal perspective, attempts to assess the impact of displacement on global development[9]. At the same time, many important aspects of strengthening the differentiation of the world community due to the concentration of specialists in the zones of economic growth are indicated.

Finally, scientists consider professional and ethnic aspects that form a new picture of post-industrial society, when the higher and partly middle links of economic systems are becoming more multicultural in their composition[10]. However, the internal characteristics of the formation of a multicultural managerial elite remain on the periphery of research interest, and the central place in various specialized developments is given to solving the problems of internationalization of the market of mass professions, rather than the internationalization of the corps of highly qualified personnel.

The problem of a comprehensive definition of intellectual migration as a special international phenomenon is closely related to the understanding of its causes. Currently, the prevailing approach is that intellectual migration is driven by the same factors as the migration of unskilled labor. The main role among them is played by differences in the economic and social development of countries and the quality of life of the working population. Along with economic motivation, factors of political stability and the existence of reliable guarantees of respect for individual rights are also taken into account, and they attract relatively more attention of qualified specialists than ordinary migrant workers[11].

At the same time, it should be noted that the directions of the flow of specialists are mediated not only by quite obvious material, but also by other objective reasons. Mass movements of highly skilled labor force

[8] Miyagiwa, K. Scale economies in education and the brain drain problem. International Economic Review, 1991, 751.

[9] Beine, M., Docquier, F., & Rapoport, H. Brain drain and human capital formation in developing countries: winners and losers. The Economic Journal, 2008, 640.

[10] Wong, K. Y., & Yip, C. K. Education, economic growth, and brain drain. Journal of Economic Dynamics and Control, 1999, 715.

[11] Stark, O. Rethinking the brain drain. World Development, 2004, 32(1), 15-22

occur under the influence of the dynamic development of the latest information technologies, which make it possible to effectively combine intellectual labor with other factors of social production and, consequently, to achieve high competitive advantages in creating advanced products for the world market[12]. In other words, the points of economic growth that are formed in different regions of the world, not only at the country level, but also at the intra-country level, have a special appeal for the social groups and individuals involved in their creation. This specificity, reflected in the human mind as positive expectations of creative work, may even outweigh more pragmatic considerations. Therefore, if not so long ago the main flows of intellectual migrants flowed to the capitals of developed industrial countries, today we can observe a significant dispersion of migration flows between leading and regional university centers, as well as advanced production clusters around the world.

As for the characterization of the consequences of intellectual migration, the existing approaches specifically emphasize the differences between foreign movements of specialists and movements of unskilled workers. Cross-border movements of unskilled workers are usually quite favorable for sending migrants from donor countries. They help to reduce unemployment, social spending, and increase foreign exchange resources due to money transfers of citizens working abroad (*remittances*). Nevertheless, in the medium term, short-term benefits usually turn into adverse consequences. With the emigration of highly qualified specialists and scientists, the donor country loses economic competition, begins to lag behind in comparison with other participants in the international division of labor[13]. The state loses the costs associated with the training of its professional and intellectual elite, without the creative potential of which modern social development is impossible. Often, such a loss results in the acquisition of additional advantages by competitors of the sending country, and the factors of "soft" and "hard" power are particularly closely intertwined when it comes to neighboring states. Thus, intellectual migration develops in various local forms, but its consequences are universal, strengthening cooperation and competition

[12] Adams Jr, R. H. International migration, remittances, and the brain drain: A study of 24 labor-exporting countries. World Bank policy research working paper, 2003, 42.

[13] Mountford, A. Can a brain drain be good for growth in the source economy?. Journal of development economics, 1997, 296.

among the members of the world community with all the inherent contradictions of international interaction.

The main causes of brain drain

1. The economic cost of brain drain

The main economic problem faced by the issuing countries is the loss of their qualified people. Departure of qualified individuals has several adverse economic consequences. First, there are direct effects, which are the most easily visible and measurable.

Departure of qualified people affects the quality of human capital at the national level, since the workforce loses its best representatives who would otherwise contribute to the economic output within a given country. Human capital, as defined by Docquier, Lohest and Marfouk (2007) "includes the knowledge, qualifications, skills and other qualities of a person that contribute to personal, social and economic well-being"[14]. Talking about the economic foundations, according to Adam Smith, these are useful talents acquired by local residents or members of society, that is, by individuals who have acquired them. It's the human capital that fuels economic activity. Human capital can be measured alternately by the average number of years of training of workers, the percentage of workers with a degree, or by the average level of literacy of workers, i.e. by the level of education of workers[15]. Therefore, we understand that human capital is a determining factor of economic growth. The decline in human capital creates a number of problems: first, there is a decline in labor productivity in industries operating in the issuing countries. Second, innovation is declining in countries affected by brain drain, as the departure of skilled people also affects scientific output as well as the maturity of private sector (e.g. number of start-ups, micro, small and medium enterprises).

2. Income

The second direct impact of the brain drain on the countries of emigration is the decline in income. Indeed, qualified people are those who, as a rule, receive the highest level of income. Thus, their departure means

[14] Docquier, F., Lohest, O., & Marfouk, A. Brain drain in developing countries. The World Bank Economic Review, 2007, 198.

[15] Stark, O. Rethinking the brain drain. World Development, 2004, 18.

the loss of their income and expenses in issuing countries. However, in the cases of people leaving their high-paid jobs, it affects the local economy as well, as they no longer contribute by paying an income tax. This loss of tax revenue is further amplified when the state partially or fully funds education of its citizens, including these future emigrant elites. Indeed, in this situation, the emigration of qualified people is a non-return on the investment in education that the state has undertaken, since its qualified people will offer the benefits of this investment to a foreign country[16]. This effect is even more pronounced when skilled citizens emigrate from the very beginning of their employment, i.e., when they leave the country, it turns out that the frequency of international migration reaches a maximum at the time of entry into working life.

3. Labor shortage in key sectors

The brain drain can also lead to a shortage of jobs, which are the basis of the country's economic development[17]. For example, brain drain can cause a shortage of doctors in the country. This is complimentary to the lack of medical universities and overall education system for health workers. However, medicine is one of the professions that significantly affect the productivity of other workers in a particular country. Indeed, by caring for sick workers, doctors can increase the productivity of these workers. Thus, the lack of doctors would have a negative effect on the country's output production. Another type of shortage of specialists that can be bad for development and that can result from brain drain is the shortage of workers involved in the accumulation and division of human capital. Therefore, for example, without teachers or lecturers, the human capital and, consequently, the productivity of the country would decline. A brain drain affecting academia can be particularly damaging to a country, this is a topic for separate research in the area.

4. Impact on the labor market and unemployment

The brain drain has a big impact on the labor market of the sending countries. Brain drain is a phenomenon that affects employment and wages in the issuing countries as stages of a complex process, according to

[16] Beine, M., Docquier, F., & Rapoport, H. Brain drain and economic growth: theory and evidence. Journal of development economics, 2001, 267.

[17] Bhagwati, J., & Hamada, K. The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis. Journal of Development Economics, 1974, 27.

the authors[18]. The first stage of this process is carried out before the brain drain. We are talking about the conditions in which developing countries find themselves. This context is basic, problematic from the point of view of the balance of supply and demand of labor and public spending. The resident elites are the source of these problems. Indeed, the elites of developing countries, who are well aware of the living conditions of their peers in developed countries, are trying to reproduce the standard of living of their fellows. To achieve this standard of living requires income that exceeds the income normally paid to skilled workers in developing countries. Thus, they will qualify for a reserve salary equivalent to that of their peers in developed countries. As a result, skilled people employed in the workplace will receive wages that are significantly higher than the national average. This implies three phenomena: on the one hand, there will be an increase in unemployment among skilled people due to wage inflation. Then the national product will also be reduced, as products that require skilled labor will be produced in smaller quantities. Finally, with a large number of unemployed citizens, the state will have less taxable income, which will lead to a decrease in its tax revenues.

Then the second stage of the process begins when the increase in the wages of skilled workers causes the phenomenon of pushed up wages in general, where the lowest wages try to fill their gap with higher wages. Accordingly, the salaries of more or less qualified specialists will also increase. The effects of this wage increase on the economy are manifold. First, in terms of employment, unemployment among the unskilled will also increase. In addition, as fewer workers are employed, the national product will shrink even further. Moreover, higher wages for qualified individuals will create a strong incentive for continuing higher education among the student population, which in turn will generate demand for an increase in the number of higher education programs. States will respond to this demand by increasing public spending on education and creating more academic programs. However, according to the authors, due to the urgency with which these projects are implemented, as well as due to the lack of funds and extensive experience in developing countries, the programs created will be of very poor quality[19]. Thus,

[18] Gibson, J., & McKenzie, D. Eight questions about brain drain. Journal of Economic Perspectives, 2011. 114.

[19] Mountford, A. Can a brain drain be good for growth in the source economy?. Journal of development economics, 1997, 294.

states will lose out doubly by investing in higher education programs, since, on the one hand, the quality of the training offered will be low, and on the other hand, graduate students will be unemployed due to unrealistic wage requirements for qualified people.

The third stage corresponds to a brain drain. In the case of emigration of qualified specialists, two things can happen. Although the emigration of skilled workers only provides employment for skilled workers who were unemployed in their home countries, and therefore does not affect wages, it has a positive impact on the issuing countries. Indeed, in this case, production and national income will not be negatively affected. Moreover, with such emigration, per capita income, including emigrants, will increase, and unemployment will decrease[20]. However, the most plausible scenario, according to the authors, is that the brain drain will lead to an increase in the wages of qualified people in the issuing countries. Two mechanisms lead to this result. First, according to the authors, when skilled people emigrate and find work abroad, the supply of skilled labor at the international level decreases, which leads to higher prices for skilled labor and, consequently, to an increase in wages. The second mechanism is that qualified resident citizens will respond to the conditions of their qualified expat compatriots who have access to higher wages after emigration. Thus, as in the first stage of this process, qualified citizens will want to compare their standard of living with the standard of living not of their foreign peers this time, but of their expat compatriots. The process of learning up wages will be resumed again and again, with the lowest wages that will try to catch up with the highest salaries. Widespread wage increases will lead to a 14% increase in unemployment among the skilled and unskilled[21]. Moreover, increasing the wages of qualified people will create a demand among the population for more qualified training. Therefore, the state will invest in higher education programs, which, again, will be of poor quality. Thus, we will witness a situation where, in addition to low-quality education, there will be a large number of unemployed graduates due to wage inflation of qualified people. In addition, some graduates will emigrate instead of participating in the economic activities of their country. Overall, per capita income will decline due to

[20] Carrington, W. J., & Detragiache, E. How extensive is the brain drain?. Finance and Development, 1999, 47.

[21] Miyagiwa, K. Scale economies in education and the brain drain problem. International Economic Review, 1991, 749.

rising unemployment, the national product will decline due to unemployment and emigration, and the state budget will also shrink due to inadequate spending on education.

5. Loss of external dynamic and external trade aspects

The economic choice of the elites provides a number of advantages for the rest of the population. Cervantes and Guellec (2002) introduce us to three types of external effects created by elites. First, there are dynamic externalities that establish a positive relationship between the presence of elites and productivity growth, as well as technological progress[22]. This is due to the fact that the more skilled the employees, the higher their efficiency. Specifically, they produce more output per person and in less time. Moreover, the human capital of skilled workers has a positive effect on the human capital of their less skilled peers, their high productivity will spread among their colleagues. These first two factors will lead to economies of scale across different industries and lead to additional benefits. Second, having highly educated workers in the economy can also encourage research and development. Technological progress obtained in this way can lead to innovations that improve the methods and tools of production and bring new benefits. The additional benefits of economies of scale and technological progress, once reallocated, will lead to an overall increase in income for all workers. This is what Cervantes and Guellec (2002) call static commercial externalities. The emigration of elites contributes to the reduction of these external factors, which is a loss for the countries of emigration[23].

The social costs of brain drain

The migration of skilled workers also has many social costs for the sending countries.

The loss of static non-market externalities is also the social benefits of the presence of elites on the quality of life in society. We believe that it is external factors that are most intuitive, such as an increase in civic sentiment, a reduction in crime, an improvement in the quality of the environment, and an improvement in public health. Thus, the emigration of qualified specialists will lead to the loss of these positive external factors for the economic and social development of the issuing countries.

[22] Cervantes, M., & Guellec, D. The brain drain: Old myths, new realities. Organisation for Economic Cooperation and Development. The OECD Observer, 2002, 19.

[23] IBID, 23.

Public/social product

In addition to the positive external effects they have on society, skilled workers also have a social product, and according to authors such as Gibson and McKenzie (2011), the social product of skilled people's human capital is in many cases superior to their economic product[24]. Take, for example, a university professor. His/her economic output will be measured based on the number of students who have completed delivered courses or the number of articles or books he/she will produce. His/her emigration, from a purely economic point of view, will only lead to the loss of so many books or so many graduates. However, the biggest loss that this professor will bring to his country is the loss caused by the lack of knowledge created by his departure. Knowledge that, of course, could raise the level of specialists working in the country, and even could lead to a major technological breakthrough. The same reasoning applies to doctors. Indeed, their economic product is evaluated based on the number of patients they treat. However, their social product is invaluable, for example, the combination of advanced health practices that they spread in society and which significantly improve the overall health of the population. Thus, the emigration of elites also has social costs, which must be taken into account when assessing the consequences of their departure.

Skilled workers and institutional progress

Institutions define themselves as the rules of the game in society, or, more formally, as the socially constructed constraints that govern human interaction. Institutions are essential for a country's economic and social development. For example, property rights that are part of economic institutions are the guarantors of investment in the country. Indeed, due to the uncertainty associated with the country's lack of property rights, foreign investors will have less incentive to invest in the country. Another example concerns the institution of the market. When the market does not exist or is ignored, the benefits of trade are not used, and resources are poorly distributed, as was the case, for example, in the USSR[25].

[24] Gibson, J., & McKenzie, D. Eight questions about brain drain. Journal of Economic Perspectives, 2011. 116.
[25] World Bank. Europe and Central Asia Economic Update, Fall 2019: Migration and Brain Drain, 2019.

Thus, the maintenance and improvement of institutions is essential for the economic development of countries. In addition, according to Zhatkanbaeva et al., (2012) human capital is one of the main drivers of institutional growth. In a study conducted in 2009, the authors tried to find out how the emigration of skilled individuals would affect the institutional development of countries that issue skilled migrants[26].

As the main theorem of the development of institutions and their improvement, the authors rely on the model of Hirschman's "exit and voice"[27]. Depending on the model they develop, the citizens of a given country respond to bad institutions or bad governance in three different ways: either they solve the problem, or they speak up, or they remain silent. Desertion – "exit" – is leaving the country, i.e. emigration. The flight is not necessarily final, as some emigrants return to their homeland through migration. The speech strategy – "voice" – manifests itself in the fight through processes such as protests, complaints, or the organization of opposition groups. Finally, the strategy of silence takes place when the people in question do not feel particularly concerned about the problem. Silence can occur in two situations: this may be the status quo, where citizens do not emigrate but also do not express their grievances, or it may also be a question of silent emigration, where citizens emigrate without reporting their grievances[28].

Each of these strategies has a negative or positive impact on the process of building and improving institutions in the countries of emigration to varying degrees.

According to the authors, a special role in this model is played by qualified citizens[29]. First, qualified citizens have a significant contribution to their country's economy when they stay in it. However, according to the authors, the expansion of economic activity allows access to more advanced institutions. Second, institutions need staff to work, and skilled workers are the most capable of being effective and ensuring the quality of services provided by institutions. Finally, skilled workers tend to bring about

[26] Zhatkanbaeva, A., Zhatkanbaeva, J., & Zhatkanbaev, E. The impact of globalization on "brain drain" in developing countries. Procedia-Social and Behavioral Sciences, 2012, 1492.

[27] Rokkan, S. Entries, voices, exits: Towards a possible generalization of the Hirschman model. Social Science Information, 1974, 42.

[28] Stark, O. Rethinking the brain drain. World Development, 2004, 20.

[29] Bhagwati, J., & Hamada, K. The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis. Journal of Development Economics, 1974, 29.

change by adopting non-violent approaches and negotiations. Thus, with qualified professionals, institutional progress is more likely to occur without violence and in conditions of political stability.

In the event of a brain drain, the departure of qualified citizens will have a number of consequences for the institutions of their country of origin that the authors present to us. Thus, a brain drain can deprive the issuing countries of all the above-mentioned positive consequences of the presence of qualified specialists. Thus, the brain drain will be detrimental to developing countries because of all the losses associated with the emigration of elites. Moreover, brain drain, with all the negative consequences that it causes, according to many economists, will lead to an increase in development inequality and the technology gap between the issuing countries, which are developing countries, and the countries that receive the brain drain flow, which have a relatively high level of development[30].

Emigration of qualified and skilled people has a positive influence on economies of receiving countries. Zhuravlev (2016) in his study found out that 40% of immigrants to the USA had doctoral degrees in engineering and computer science, 25% were teachers of technical majors in universities. Currently there are 46 mln. migrant workers in USA with total income 960 billion US dollars annually, who paid 160 billion US dollars in taxes and other payment to the federal budget. At the same, the US government's expenditures on social costs for immigrants is 20 billion US dollars. Obviously, in simple monetary terms the return is quite high for American society, in addition to immigrants contribution to the development of American science, medicine and art. [31]

Brain drain in Kazakhstan

Of a great concern for Kazakhstan is the danger that educated professionals leave abroad for education, work or other reasons and decide not to return. First, it is necessary to analyze the problem of a large influx of intellectual migration – the outflow of ready-made specialists with higher education, as well as the situation of non-return to the country of young people who went abroad to get education.

[30] Beine, M., Docquier, F., & Rapoport, H. Brain drain and human capital formation in developing countries: winners and losers. The Economic Journal, 2008, 639.

[31] Zhuravlev S., The great migration power by the experts eyes. Knowledge is the power. 2016, pp 52-55.

It is possible to understand the situation when during the first decade of independence of Kazakhstan, that is, from the beginning of the 1990s to the 2000s, the brain drain rushed out. After all, many representatives of minority ethnic groups living in Kazakhstan returned to their historical homeland. According to state statistics, for the period from 1994 to 2004, 245,390 people with higher education, 82,974 people with incomplete higher education and 463,323 people with secondary special education left Kazakhstan. The difference between those who left and those who arrived: 152,949 people – with higher education, 36,947 – with incomplete higher education and 383,705 – with secondary special education. These losses were high until 2004, and since 2004, they have shown relatively low emigration activity, as the rate of migration of representatives of other ethnic groups to their homeland has slowed down. Analyzing the composition of specialists with higher education who left the republic in the period from 1996 to 2004, we see that out of 184,632 people who left the republic, 47,563 – technical, 37,990 – pedagogical, 19,266 – medical, 18,380 – economic, 12,061 – architectural and construction, 9,595 – agricultural, 4,500 – legal, 35,277 – other specialties[32].

Figure 1. Number of emigrants with tertiary education, 2010-2019

Source : Bureau of National statistics of Kazakhstan

Currently, one of the main reasons is the underestimation of educated professionals, especially young minds, as well as destructive corruption, which largely prevents the employment of people. They will have to look for better earnings in high-paying places for intellectual work.

[32] Abazov, R. Central Asia's Skilled Migrants: Brain Drain or Brain Gain?. The Central Asia-Caucasus Analyst, 2010, 14.

Intellectual migration in the 1990s is characterized by the return to the historical homeland of representatives of other nationalities living in Kazakhstan with the fall of Soviet power. After the 2000s, the brain drain began to change not on a national basis, but on social, economic, and political issues[33].

The relocation of highly educated citizens to other countries will increase the brain drain and have a negative impact on society. In 2000, technical specialists – 13998, teachers – 5460, economists – 3906, health workers – 2868, architecture – 2195 people left the country. In addition, we see that among the flow of intellectuals who left Kazakhstan during this period, the indicator of technical specialists is high. In addition, in 2006, the statistics index slightly decreased and the number of dropouts decreased: technical specialists – 290, teachers – 623, economists – 74, health workers – 499, architecture – 252[34]. Consequently, economic stability in the country has stopped the mass relocation of specialists.

The global crisis of 2008 - 2010 did not affect significantly the flow of emigration from the country. That is, the transition process has somewhat stabilized. In 2017, that is, in recent years, the influx of economists abroad has increased more than that of other specialists – 2,805, teachers – 1,633, technical specialists – 5,293, medicine – 578, architecture – 453[35].

Overall number of people leaving the country is steadily increasing. If in 2014 total 28 800 left the country, in 2019 45200 people, increase of 56% or plus 3400 people every year during 2014-2019. According to the figure 2 below, share of emigrants in terms of total population increased from 0.168% to 0.246%.

[33] Molchanov, M., Baikushikova, G., & Kuzembayeva, A. Educational migration in Eurasia: new trends. Серия международные отношения и международное право, 2018, 74.

[34] Топилин, А. В. Общии рынок труда и миграция: новые возможности в рамках ЕАЭС. Вестник Самарского государственного экономического университета, 2015, 74.

[35] Bureau of National statistics of the Republic of Kazakhstan, (2000-2020), https://stat.gov.kz/official/dynamic

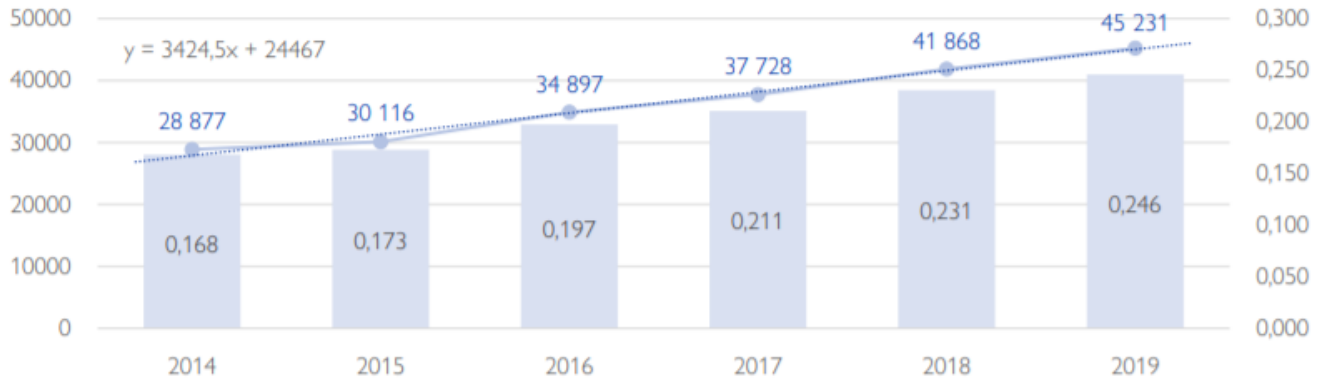


Figure 2. Number of total emigrants in 2014-2019

Source : Bureau of National statistics of Kazakhstan

It is known that intellectual migration processes in Kazakhstan currently take place in relation to various factors: socio-economic, political, ethnic and other influences. The regulation of migration processes since the first year of independence still remains unresolved, although it is considered one of the most relevant areas of state policy.

Student migration

Foreign educational institutions make many effective steps in attracting intelligent students from all over the world. They attract Kazakhstani graduates with various grants and scholarships. Since 1996, Germany has accepted students studying in German, based on the level of linguistics, for free education at any university. In addition, the Baltic States began to attract students by providing scholarships and free housing[36].

Russia attracts Kazakhstani school graduates. With the appointment of scholarships, free accommodation, and the provision of conditions for further employment, Kazakhstan loses promising students. Russian universities also conduct exit exams in Kazakhstan. This, in turn, is less costly than going to another state and taking entry exams, in addition to a remote testing modality which is offered by some universities. Therefore, the ways of entering the educational institution have already been simplified.

[36] Kaliaskarova, G., & Zhanpeiisova, K. The State of Intellectual Migration of youth in the Republic of Kazakhstan. Bulletin d'EUROTALENT-FIDJIP, 2019, 69.

Educated professionals from Kazakhstan aspire to work in the USA, Canada, Russia, Germany, Israel, Hong Kong, Singapore, China. It is more profitable to use its own specialists than to attract specialists from abroad[37]. It is becoming more difficult to deal with the consequences of irrevocable intellectual emigration, as the competition for intelligence is growing all over the world, and Kazakhstan does not yet make special offers for its smart graduates and talents. That is, there are no advantages in terms of salary, social package, and many other parameters compared to developed countries.

According to the Ministry of Education and Science, about 120 thousand Kazakhstani students are studying abroad, where 80% of students from Kazakhstan study in the Russian Federation.

Kazakhstan has more than 120 higher education institutions for 18 million people[38]. Another problem of higher education is the centralized control of the state over the content of education and the process of its organization. This limits the freedom of universities and their ability to respond to the needs of the economy, students, and employers. A very complex system for assessing the quality of education has been formed. There, the priority is given to inspections, rather than self-assessment and university excellence. Research and innovation activities and the involvement of employers in cooperation with universities are also carried out at a low level.

Research and educational activities are the main issue of concern to students. Therefore, students who are talented, educated, trained in special schools, who have Olympiad achievements, choose higher educational institutions with a world-class rating. This means that it is better for Kazakhstan to raise competitive educational institutions to a decent level that meets the needs of young people seeking education. In this case, of course, graduates choose those educational institutions that occupy a high place in the world ranking, provide grants, scholarships, and free dormitories.

Kazakhstan is now becoming a “donor” of students around the world. To change this situation, the government and universities should strengthen their work. That is, Kazakhstan should focus as much as possible on improving its competitiveness in the market of educational services.

[37] Нурмагамбетов, А., Иватова, Л., & Хасенова, Л. Образовательная миграция в контексте совершенствования системы высшего образования Республики Казахстан. Казахстан-Спектр, 2021, 37.

[38] Zhanpeisova, K., Kaliaskarova, G., Gabdulina, B., & Mukasheva, M. Brain Drain From the Republic of Kazakhstan as analyzed by political scientists. Central Asia & the Caucasus, 2020, 722.

Kazakhstan's economic losses from intellectual emigration are high. The reduction of human capital will undoubtedly have a negative impact on the development of the country. It has a negative impact on the industrial development and the general economic situation of the state. In particular, there are not enough jobs for specialists with humanitarian education, who are not in demand in the labor market, and, on the contrary, there is a shortage of technical specialists in the country. However, some opinions also show the opposite sides of intellectual migration. For example, they say that departed specialists not only have a high salary, but also have the opportunity to gain experience in foreign companies, gain experience, gain new knowledge, and then come to the country[39].

Therefore, first, it is necessary to attract talented young specialists with various awards and grants, so that the level of education in intellectual migration flows is much higher than the national average, and to minimize the process of emigration of people with higher education. Secondly, without combating the problem of corruption in the country, it is impossible to employ young professionals, if they have a competitive offer from developed countries. Third, the owners of intelligence, who came to the country, will certainly raise the level of domestic educational institutions. Thanks to joint research work with selected students, access to meeting the requirements of the country's talents is opened. Thus, it is possible to give an impetus to domestic science, and young specialists will have more opportunities to engage in science and develop in their homeland.

Push and pull factors of emigration

In the research by Lee (1966) the theory of migration factors was introduced, so called *push* and *pull* factors of migration. His theory explained migration as a phenomenon that occurs under the influence of negative factors pushing people out of the country of origin (*push*) and positive factors that attract people to another country (*pull*). The list of push factors includes economic, social and political difficulties, while factors attracting migrants include comparative advantages, often in wealthier countries. Combinations

[39] Nasimova, G., Kaplan, C., Smagulov, K., & Kartashov, K. Reasons for and factors in educational migration from Kazakhstan. Central Asia and the Caucasus, 2020, 139.

of push and pull factors determine the size and direction of flows. The basic assumption is that in the most unfavorable place for life, an increase in migration is more likely. [40]

According to the online survey made by International organization on migration in 2019 among 80 people from Kazakhstan who have been residing abroad from 1 to 24 years the following *push* factors of emigration from Kazakhstan were revealed.

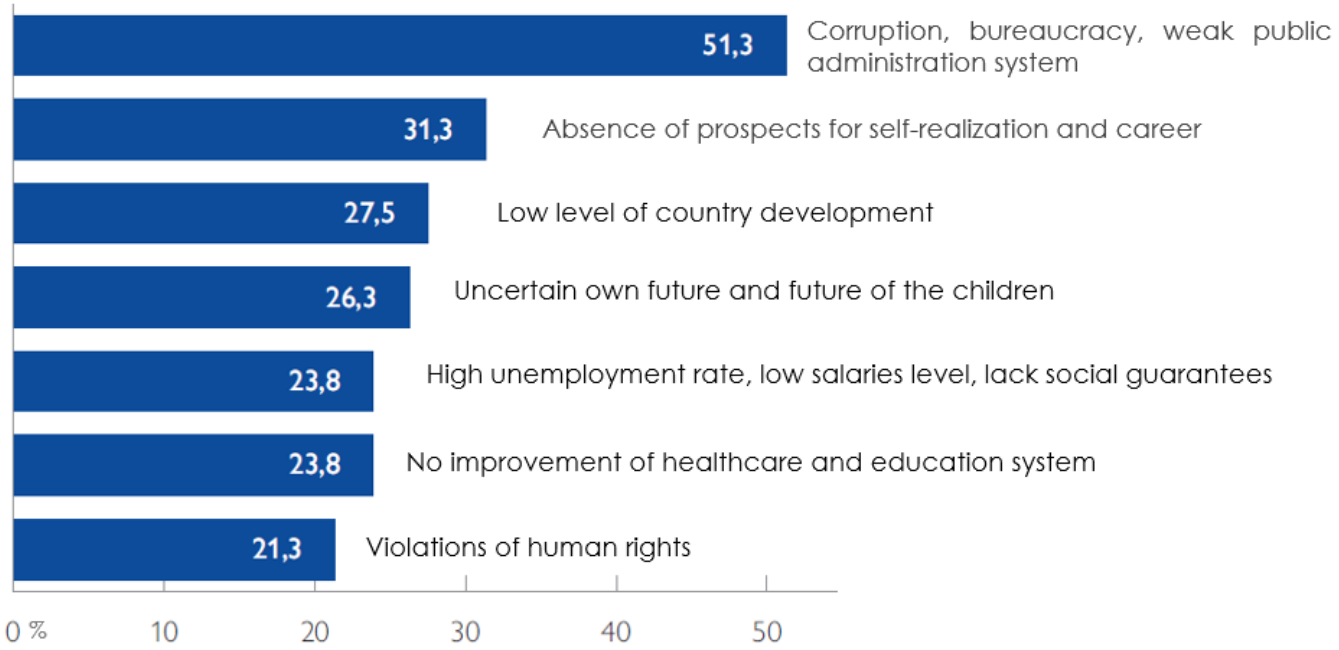


Figure 3: The most common answers of respondents from Kazakhstan to the question "What was your motivation for leaving your homeland?" (Online survey of people living abroad, %)

Source: IOM survey. 2019

In the frame of the same survey the following *pull* factors attract Kazakhstani citizens abroad.

[40] Lee E.S. (1966) A Theory of Migration // Demography, Vol. 3, No. 1.p. 47-57.

Figure 4: The most common answers of respondents from Kazakhstan to the question: "What goals are you pursuing while abroad?" (Online survey of people living abroad, %)

Source: IOM survey. 2019

Later, in 1996, S. Oberg in his study introduced the concepts of "hard" and "soft factors". Among the "hard" factors humanitarian crises, military conflicts, environmental disasters were underlined. On the other hand, among the "soft factors" poverty, social inequality and unemployment were introduced. This theory was criticized because in the proposed models the explanation why regions with similar characteristics and quality of life indicators have an uneven volume of migration, and they also cannot explain the direction of flows.[41]

Modern researches on modelling the migration: main reasons and factors.

Ghatak, Mulhern, Watson (2008) made analysis of migration flows from Poland. The research revealed that unemployment in the country of origin, distance between countries and GDP per capita have a significant effect on migration. Etzo (2011) using fixed effects vector decomposition model in his study discovered that GDP per capita and unemployment are key *push* factors from regions across Italy. Libman (2009) in his research stated that emigrants highly value the political freedom and competitiveness,

[41] Oberg, S. Spatial and Economic Factors in Future South-North Migration. W. Lutz (ed.). - Earthscan, London, 1996, pp. 336-357

therefore with all other factors being equal they tend to emigrate to a more democratic society. Cooray et al (2016) revealed that corruption leads to higher emigration rates, especially among skilled workers.

Methodology.

Taking into account the push factors revealed by the IOM survey and existing literature in the area, the study conducted here is to test the relationship between emigration and total unemployment, GDP per capita, Corruption perceptions index, Gini index, Human Development Index, Voice and Accountability, Rule of Law, Political Stability and Absence of Violence/Terrorism, Government Effectiveness with the use of comparative approach by analyzing panel data. The panel data analysis is made for the period of 2005-2019 years in Kazakhstan, Kyrgyzstan, Armenia and Belarus. Data for 1991-2005 is not used because emigration during that time was mainly caused by the collapse of the Soviet Union and associated with ethical background and family reunification.

Emigration is the dependent variable and measured in terms of per capita value (population divided by the emigration amount in absolute terms). Data was obtained from Statistics agencies of countries involved. This variable is denoted by E.

Unemployment is the first independent variable, measured as percentage of labor force without work, seeking work in a recent past period, and currently available for work, including people who have lost their jobs or who have voluntarily left work. Data was obtained from Statistics agencies of countries involved. Denoted by U.

GDP per capita is the second independent variable for this model, measured as the total value of all goods and services produced by the country divided by its population. Data was obtained from World Bank database. Denoted by RGDP.

Corruption perceptions index is the third independent variable which measures the countries on the basis of the perceived corruption level, ranging from 0 (very corrupt) to 100 (no corruption). The index was created and assessed by Transparency International. Denoted by CPI.

GINI index is the fourth independent variable which measures the deviation extent of income distribution from a perfectly equal distribution, ranging from 0 (perfect equality) to 100 (perfect inequality). Data was obtained from World Bank database. Denoted by GINI.

The Human Development Index is the fifth independent variable which shows the average summary measure of long and healthy life, being educated and have a good standard of living. The HDI ranges from 0 to 1. Data was obtained from United Nations Development Program. Denoted by HDI.

Voice and Accountability is the sixth independent variable which measures to what extent people can participate in state elections, freedom of speech and freedom of media. Ranges from -2.5 to + 2.5. Data was obtained from World Bank database. Denoted by VA.

Rule of Law is the seventh independent variable, which measures the confidence and abide by the society rules, including level of contract enforcement, property rights, law enforcement bodies, as well as likelihood of violence and crimes. Ranges from -2.5 to + 2.5. Data was obtained from World Bank database. Denoted by RL.

Political Stability and Absence of Violence/Terrorism is the eighth independent variable which measures perceptions of political instability, politically related violence and terrorism. Ranges from -2.5 to + 2.5. Data was obtained from World Bank database. Denoted by PS.

Government Effectiveness – is the ninth independent variable which measures the quality of public/civil service, independence from politically motivated pressure, overall quality of policy implementation and government credibility. Ranges from -2.5 to + 2.5. Data was obtained from World Bank database. Denoted by GE.

The start regression is:

$$E_t = \beta_0 + \beta_1 U_t + \beta_2 CPI_t + \beta_3 RGDP_t + \beta_4 GINI_t + \beta_5 HDI_t + \beta_6 VA_t + \beta_7 RL_t + \beta_8 PS_t + \beta_9 GE_t + \varepsilon_{it}$$

As for our application, the assessment is based on emigration from Kazakhstan. Calculation or obtaining statistics on skilled emigration faces accessibility problems. Additionally, statistics agencies of countries do not divide overall emigration into categories by education. Thus, the emigration rate is used as an explanatory variable in the data panel, suggesting a high correlation between the qualified migration rate

and migration rate, as well taking into account the statistical fact that majority of people who emigrate have a tertiary education.

Data analysis

One of the ways to calculate the relationships between the dependent variable and independent variables is to run the OLS model. The R Studio software package was used for calculations. The information on the descriptive statistics is given in the Appendix 1.

```
Call:
lm(formula = Emmigration ~ Unemployment + GDP.per.capita + CPI.score +
    GINI.index + HDI.Index + Voice.and.Accountability + Rule.of.Law +
    Political.Stability.and.Absence.of.Violence.Terrorism + Government.Effectiveness,
    data = db1)

Residuals:
       Min         1Q     Median         3Q        Max
-0.0094212 -0.0010026  0.0001627  0.0010053  0.0066436

Coefficients:
                                                    Estimate Std. Error t value Pr(>|t|)
(Intercept)                                       -1.650e-02  1.515e-02  -1.089  0.28119
Unemployment                                       8.566e-04  1.194e-04   7.176 3.19e-09 ***
GDP.per.capita                                     1.949e-07  2.160e-07   0.902  0.37118
CPI.score                                         -1.167e-05  9.866e-05  -0.118  0.90635
GINI.index                                         1.987e-04  1.338e-04   1.485  0.14395
HDI.Index                                          3.148e-03  2.160e-02   0.146  0.88471
Voice.and.Accountability                          -1.187e-03  1.841e-03  -0.645  0.52202
Rule.of.Law                                       -6.686e-03  2.960e-03  -2.259  0.02831 *
Political.Stability.and.Absence.of.Violence.Terrorism -2.197e-03  9.460e-04  -2.323  0.02431 *
Government.Effectiveness                           5.311e-03  1.753e-03   3.031  0.00386 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.002349 on 50 degrees of freedom
Multiple R-squared:  0.7432,    Adjusted R-squared:  0.6969
F-statistic: 16.08 on 9 and 50 DF,  p-value: 5.857e-12
```

Figure 5: Results of OLS regression

Source: own calculations in R studio.

According to the results of OLS regression the R^2 is 0.7432, meaning that 74% variation in emigration could be explained by the model. Unemployment is statistically significant variable which positively correlates with emigration, thus the higher is unemployment rate the more people will look for employment opportunities elsewhere bringing the emigration level up. Rule of law and Political stability are negatively correlated with emigration, meaning that higher values (e.g. positive changes in these variables) will lead to a lower migration; both variables are statistically significant. Another significant variable is Government Effectiveness, but surprisingly it is positively correlated with emigration, meaning that despite improvements in the quality of government services the number of emigrants tends to rise.

GINI index is not statistically significant, but we can observe a positive correlation with emigration - the more unequal the income distribution is the higher is emigration. GDP per capita, CPI, HDI index, Voice and accountability are not statistically significant at all.

Another approach to calculate the relationships between the dependent and independent variable is to run Fixed effects model (within estimator).

```
Residuals:
       Min.      1st Qu.       Median      3rd Qu.         Max.
-0.009826652 -0.000786872 -0.000060719  0.000741233  0.005863711

Coefficients:
                                                        Estimate     Std. Error t-value     Pr(>|t|)
Unemployment                                         0.00106039539  0.00017487482  6.0637 0.0000002155
GDP.per.capita                                       0.00000027022  0.00000028578  0.9455      0.34922
CPI.score                                            0.00006206815  0.00011118002  0.5583      0.57931
GINI.index                                           0.00035875258  0.00016568060  2.1653      0.03547
HDI.Index                                            0.02724388013  0.02863619081  0.9514      0.34628
Voice.and.Accountability                            -0.00523521755  0.00251137249 -2.0846      0.04256
Rule.of.Law                                         -0.00390780022  0.00382079998 -1.0228      0.31165
Political.Stability.and.Absence.of.Violence.Terrorism -0.00042784448  0.00131488648 -0.3254      0.74633
Government.Effectiveness                             0.00336324651  0.00226915210  1.4822      0.14497

Unemployment                                        ***
GDP.per.capita
CPI.score
GINI.index                                          *
HDI.Index
Voice.and.Accountability                            *
Rule.of.Law
Political.Stability.and.Absence.of.Violence.Terrorism
Government.Effectiveness
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Total Sum of Squares:    0.00055914
Residual Sum of Squares: 0.00024455
R-Squared:      0.56264
Adj. R-Squared: 0.45097
F-statistic: 6.71798 on 9 and 47 DF, p-value: 0.0000040346
```

Figure 6: Results of Fixed effects

Source: own calculations in R studio.

To test which model is better the F-test was run.

```
        F test for individual effects

data:  Emmigration ~ Unemployment + GDP.per.capita + CPI.score + GINI.index +  ...
F = 2.0008, df1 = 3, df2 = 47, p-value = 0.1267
alternative hypothesis: significant effects
```

Figure 7: Results of F-test

Source: own calculations in R studio.

Null hypothesis: OLS is better than fixed effects.

According to the results the p-value equals to 0.1267, and if p-value < 0.05 => FE model is a better choice, therefore null hypothesis is accepted.

Since OLS is preferable model, test for multicollinearity among independent variables was conducted using Data analysis in Excel.

	Emmigration	*Unemployment*	*GDP per capita*	*CPI score*	*GINI index*	*HDI Index*	*Voice and Acco*	*Rule of Law*	*Political Stabili*	*Government*
Emmigration	1									
Unemployment	0.78	1.00								
GDP per capita	-0.34	-0.39	1.00							
CPI score	0.05	0.19	0.21	1.00						
GINI index	0.49	0.45	-0.41	-0.23	1.00					
HDI Index	-0.25	-0.14	0.79	0.57	-0.43	1.00				
Voice and Accountability	0.49	0.60	-0.50	0.16	0.41	-0.49	1.00			
Rule of Law	0.32	0.53	0.34	0.61	0.09	0.50	0.39	1.00		
Political Stability and Absence	-0.31	-0.14	0.51	0.19	-0.31	0.67	-0.55	0.22	1.00	
Government Effectiveness	0.36	0.42	0.30	0.58	0.07	0.39	0.37	0.66	0.15	1.00

Figure 8: Results of multicollinearity test

Source: own calculations in MS Excel.

According to the results above, no multicollinearity exists between independent variables, which measures different indicators.

Model description

The study of the composition of factors influencing the emigration in Kazakhstan in this work is directly related to the state of the labor market, which in turn is of paramount importance for determining the future contours of employment policy, as well as social-political situation in the country. Note that each country with a similar trajectory of economic development has its own set of factors that affect emigration, but many researchers single out the labor market and its elements as the main factor. Even internationally recognized economic patterns can act differently in different conditions, or not at all. Informal employment occurs under various circumstances. Thus, in countries with high natural population growth, the key factor of its occurrence is demographic, in countries with high wages – the degree of this overestimation, etc. In other cases, scientific and technological progress, industrial restructuring of the economy, a massive influx of immigrants, and other reasons play a role.

At the initial stage of the study, a significant number of factors used to predict the development and assessment of the potential of the labor market of the Republic of Kazakhstan were considered. According to the analysis of the current state and dynamics of development, the total potential of the labor market of Kazakhstan is estimated as quite high, quite favorable for its further development. At the same time, the main sources of sustainable development of the country's labor market and the reduction in the share of the informal employed should be quantitative (wage growth, reduction in unemployment) and qualitative (increase in the educational level of the population) factors that have proven their effectiveness and efficiency over the past period in accordance with the below table.

Indicators	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Gross national income (GNI) per capita by PPP, thousand USD	7.25	8.54	9.62	10.54	11.65	12.58	13.91	15.24
GDP per capita, billion USD	18.29	22.15	24.64	30.83	43.15	57.12	81	104.8
Employed population, thousand people	6201	6698.8	6708.9	6985.2	7181.8	7261	7403.5	7631.1
Unemployment rate, %	12.8	10.4	9.3	8.8	8.4	8.1	7.8	7.3
Youth unemployment rate (15-28 years), %	-	16.6	14.7	12.7	12.6	11.9	11.5	9.7
Average nominal salary per employee, tenge	14374	17303	20323	23128	28329	34060	40790	52479
Human Development Index	0.736	0.739	0.744	0.751	0.755	0.754	0.759	0.753

Indicators	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Gross national income (GNI) per capita by PPP, thousand US dollars	15.46	16.03	16.71	17.79	19.05	21.9
GDP per capita, billion USD	133.44	115.31	148.05	200.38	215.9	243.78
Employed population, thousand people	7857.2	7903.4	8114.2	8301.6	8507.1	8570.6

Indicators	2000	2001	2002	2003	2004	2005	2006	2007
Unemployment rate, %		6.6	6.6	5.8	5.4	5.3	5.2	
Youth unemployment rate (15-28 years), %		8.4	8.5	6.6	6.1	5.4	4.2	
Average nominal salary per employee, thousand tenge		60805	67333	77611	90028	101263	109141	
Human Development Index		0.736	0.739	0.744	0.751	0.755	0.754	

Indicators	2008	2009	2010	2011	2012	2013
Gross national income (GNI) per capita by PPP, thousand US dollars	15.46	16.03	16.71	17.79	19.05	21.9
GDP per capita, billion USD	133.44	115.31	148.05	200.38	215.9	243.78
Employed population, thousand people	7857.2	7903.4	8114.2	8301.6	8507.1	8570.6
Unemployment rate, %	6.6	6.6	5.8	5.4	5.3	5.2
Youth unemployment rate (15-28 years), %	8.4	8.5	6.6	6.1	5.4	4.2
Average nominal salary per employee, thousand tenge	60805	67333	77611	90028	101263	109141
Human Development Index	0.736	0.739	0.744	0.751	0.755	0.754

Indicators	2014	2015	2016	2017	2018	2019
Gross national income (GNI) per capita by PPP, thousand US dollars	22.19	21.76	21.49	22.16	22.95	24.08
GDP per capita, billion USD	227.44	184.36	137.28	159.4	170.54	181.67
Employed population, thousand people	8510.1	8433.3	8553.4	8585.2	8695	8780.8
Unemployment rate, %	5.0	5.1	5.0	4.9	4.9	4.8
Youth unemployment rate (15-28 years), %	4.4	4.1	3.9	3.8	3.7	3.6
Average nominal salary per employee, thousand tenge	121021	126021	142898	150827	162673	186815

Indicators	2014	2015	2016	2017	2018	2019
Human Development Index	0.757	0.788	0.794	0.805	0.817	0.821

Figure 9 – Dynamics of the main indicators of the labor market and the economy of Kazakhstan for the period 2000-2019.

Source: Bureau of National statistics of Kazakhstan

Presentation of the main results and tests

Number of conclusions can be drawn from the results of OLS regression, indicating specific features of emigration in Kazakhstan.

Firstly, the results show that the most significant variable is unemployment which is positively correlated with migration in Kazakhstan. The same result was obtained by Etzo (2011) and Ghatak (2008) in their respective researches. Such results allows us to make a conclusion that as unemployment rises in the country of origin, more people will tend to emigrate to find job opportunities elsewhere, which is quite reasonable.

Secondly, the Rule of Law and Political Stability/Absence of violence proved to be significant. For example, countries with a high rule of law index can be attractive because of their guarantees of human rights protection. Protection issues also play an important role in migration processes. That is why guarantees of social protection are no less important than economic and financial benefits. This means that these immigrants value highly the protection of their individuality, political and civil rights. Usually, people do emigrate if they want to improve their standard of living, of course if there is an such opportunity to do so. In most cases, international migrants hope to get a better life not only for themselves but also for their children. In some cases this can also mean that people have already faced cases of human rights abuses in their homeland countries. Therefore, it is quite logical that they try to avoid such oppression in the future, and that is why they choose countries with strong democratic traditions, where they feel safer. It could be noted, that this is a very strong factor in predicting flows of immigrants with high potential, perhaps one of the most important in migration research. Currently, cases of not only

oppression and violations of human rights are widespread in the world, but also the murder of innocent people under various pretexts. Unsurprisingly, people choose to look for a better place to go on with their lives.

Thirdly, GDP per capita was proved to be not significant and positively correlated with emigration. Such result contradicts with other works in the area, when GDP per capita was one of the main push factors from other countries. Probably the answer is that people in studied countries do not simply look for this value and search for it meaning when about to make a decision to emigrate, or alternatively do not feel fluctuations of GDP per capita and its influence on their own lives.

Fourthly. According to the IOM survey the most popular answer as a push factor was corruption. In this research CPI index was proved as not significant, although negative correlation was detected (the higher it is, a country is less corrupted, thus the emigration is lower). Such discrepancy of results probably lies in the approach and methodology used by Transparency International to measure corruption. Survey was answered by ordinary people who could have been facing corruption in everyday life, on the other hand CPI index is evaluated using official data (which could be biased) and calculated by two in-house and independent researchers, who do not see the real penetration of corruption into lives of ordinary people. An assumption could be made that real level of corruption in even worse, but this is part of a separate research.

Fifthly, GINI index is also not significant, but was very close to the significance level. But the correlation is positive, meaning the more unequal the income distribution is, the emigration will tend to rise.

This result allows us to emphasize the idea that the nature and reasons for the high propensity of workers to emigrate are related to their various features: economic specifics, social and political realities. In simple words, the brain drain and emigration increases significantly as the country's standard of living declines.

Concluding remarks

Migration plays a crucial role in the development of countries, it changes economic and social position of people. The study focused on the push factors of migration. Migration theories that focus on purely economic factors are unable to capture the broader social context in which decisions are made. The study allowed analyze other factors affecting migration processes, like CPI index, GINI index, HDI index, Rule of Law, Political stability, Government effectiveness, Voice and accountability and describe their influence on evolution of migration decisions. The modern process of international labor migration needs particular attention from researchers. In recent decades, the vector of migration movements was completely changed. Nowadays, international migration has evolved as one of the constituent parts of the global economy. Many countries have revealed themselves both as donors and recipients. The scale and importance of such a phenomenon as "brain drain" is gaining more and more attention every year. These and many other facts are the main distinguishing features of modern labor migration. If brain drain will dramatically increase in the following years it could lead to the decline of educational level, decrease of scientific and technical potential, and as a final destination bring a threat to the national security of a country. Annually, Kazakhstan increases the number of scholarships and grants in local universities, number of programs delivered in English is also going up. Generally, government spending on education could not have paid its investments back and results of such investments could work and contribute to the economic development of other countries. Currently there is a Conception on migration policy exists in Kazakhstan, but the issue of emigration is not covered to deep extent, which reflects the position of the government of not paying a due attention to this issue. With national goals of switching to knowledge-based and industrial economy, which should gradually decrease dependency on oil and gas sector, the shortage of qualified and skilled personnel will be obvious in mid-term perspective. This initial work could be useful for government of Kazakhstan and encourage them to propose specific support measures for skilled populations wishing to migrate, and to implement economic policies (especially in the labor market and governance work) adapted to the geo-socio-economic conditions in which they are developing. Further research could be implemented by collecting primary data, engage in questionnaires

and focus interviews to define motivation behind decision to migrate more precisely, i.e. push and pull factors, and therefore obtaining more accurate results for proper decision-making. Apart from that, this study did not include gender aspect as well as regional statistics on emigration from Kazakhstan.

Ultimately, in Kazakh society, recent discussions on brain drain and empirical work highlight the importance of this phenomena.

Kazakhstan needs to establish work on the assessment and analysis of the damage caused by the loss of human and intellectual capital. Otherwise, it is difficult to assess the prospective demand for labor in the country and minimize the gap between supply and demand in the labor market.

Appendix 1 – Descriptive statistics of OLS model

	vars	n	mean	sd	median	trimmed	mad
id*	1	60	2.50	1.13	2.50	2.50	1.48
year	2	60	2012.00	4.36	2012.00	2012.00	5.93
Emmigration	3	60	0.00	0.00	0.00	0.00	0.00
Unemployment	4	60	9.01	4.61	7.41	8.33	2.18
GDP.per.capita	5	60	4915.50	3442.84	3998.54	4571.43	3987.87
CPI.score	6	60	28.57	6.24	28.00	27.98	5.19
GINI.index	7	60	29.18	2.93	28.25	28.80	2.15
HDI.Index	8	60	0.75	0.05	0.76	0.75	0.06
Voice.and.Accountability	9	60	-0.99	0.43	-1.05	-0.99	0.53
Rule.of.Law	10	60	-0.77	0.35	-0.82	-0.77	0.43
Political.Stability.and.Absence.of.Violence.Terrorism	11	60	-0.17	0.50	-0.06	-0.15	0.51
Government.Effectiveness	12	60	-0.49	0.37	-0.46	-0.48	0.47
Current.health.expenditure.per.capita	13	52	254.46	124.22	281.35	257.35	128.45
Expenditure.on.tertiary.education	14	39	13.85	4.59	13.90	14.01	3.86

	min	max	range	skew	kurtosis	se
id*	1.00	4.00	3.00	0.00	-1.41	0.15
year	2005.00	2019.00	14.00	0.00	-1.27	0.56
Emmigration	0.00	0.02	0.02	1.40	0.93	0.00
Unemployment	4.71	19.01	14.30	1.23	-0.02	0.59
GDP.per.capita	476.55	13890.63	13414.08	0.69	-0.32	444.47
CPI.score	18.00	45.00	27.00	0.76	0.35	0.81
GINI.index	25.20	39.80	14.60	1.39	2.16	0.38
HDI.Index	0.64	0.82	0.18	-0.48	-0.93	0.01
Voice.and.Accountability	-1.77	0.05	1.82	0.12	-0.81	0.06
Rule.of.Law	-1.37	-0.12	1.25	0.08	-1.10	0.04
Political.Stability.and.Absence.of.Violence.Terrorism	-1.39	0.78	2.16	-0.40	-0.56	0.06
Government.Effectiveness	-1.13	0.12	1.25	-0.19	-1.21	0.05
Current.health.expenditure.per.capita	45.97	456.49	410.52	-0.35	-1.25	17.23
Expenditure.on.tertiary.education	3.02	26.71	23.69	-0.18	0.93	0.74

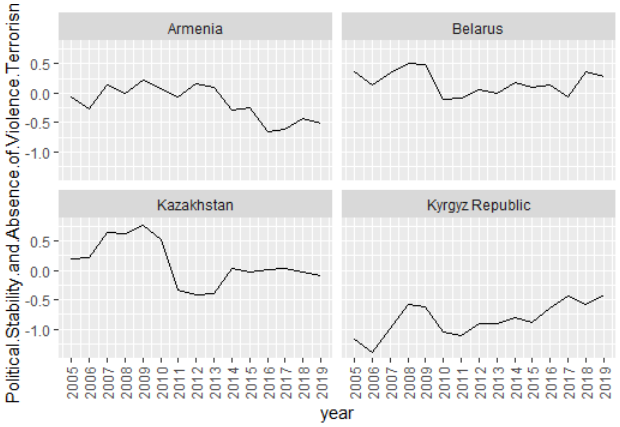
Appendix 2 – PEST analysis of pull factors

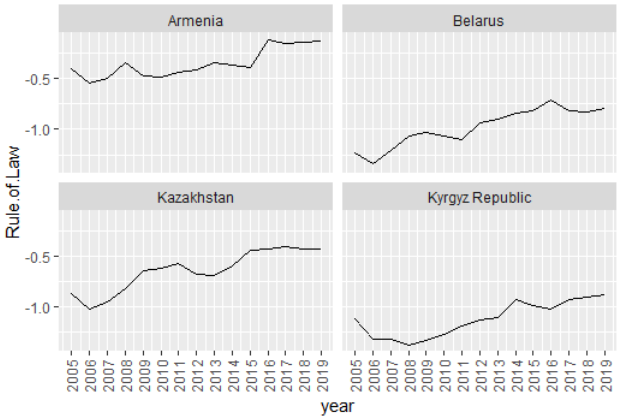
Political	Economic
► Trust in law enforcement agencies ► Strong civil society and democratic institutions ► Low corruption and protectionism ► Human rights ► Succession of power ► Compliance with the rule of law	► High standard of living and welfare ► Decent pay ► Economic stability ► Diversified economy ► Fair competition and business development
Social	**Technical**
► Prospects for children ► High quality education and health system ► Professional demand ► Meritocracy ► Culture of population and social environment	► Highly developed science ► Developed infrastructure focused on personal comfort ► Open and competitive support for technological breakthroughs

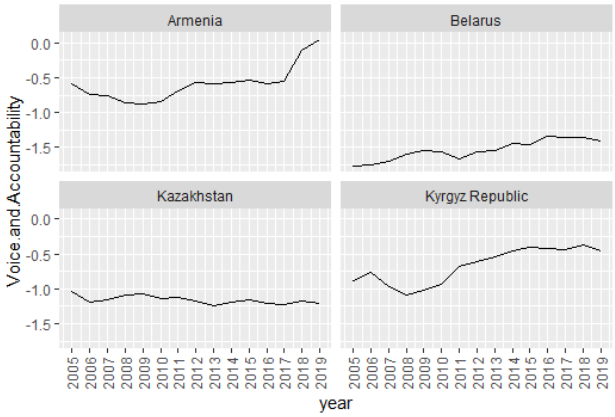
Appendix 3 – PEST analysis of push factors

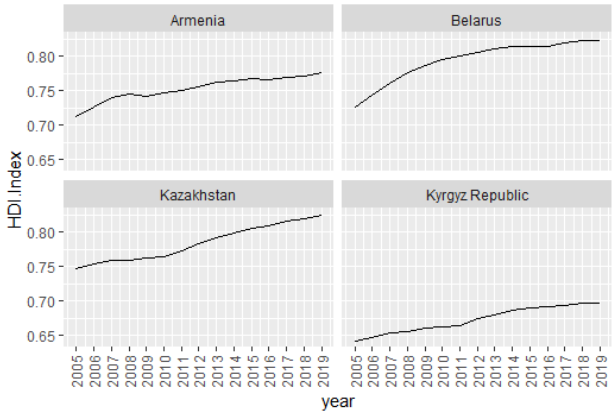
Political	Economic
► Corruption and bureacracy ► Restrictions on freedom of speech ► Violation of human and civil rights ► Broken democratic institutions ► Inefficient government and reforms ► Weak civil society	► Low level of country development ► Lack of economic prospects ► Low wages, inability to purchase housing ► Income inequality
Social	**Technical**
► Weak social security, including heath and education ► Lack of social elevators, prospects for self-realization and career ► Difficulties in finding a job without "necessary connections" ► Intolerance, hostility of society	► Low level of development of science ► Weak level of research and development mechanisms ► Low demand for scientific personnel

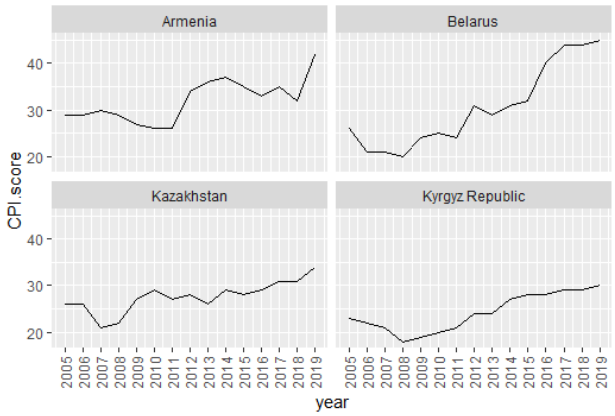
Appendix 4 – PEST analysis of push factors

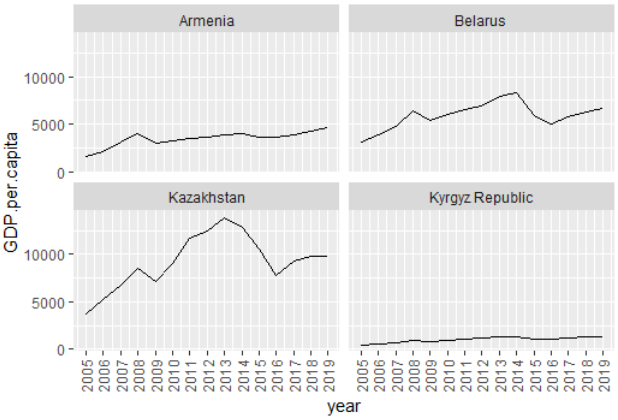


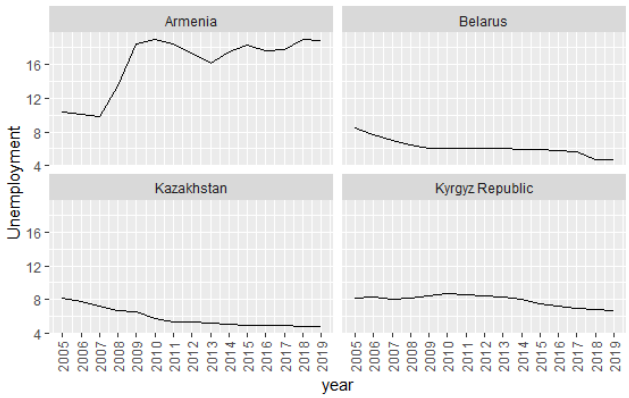


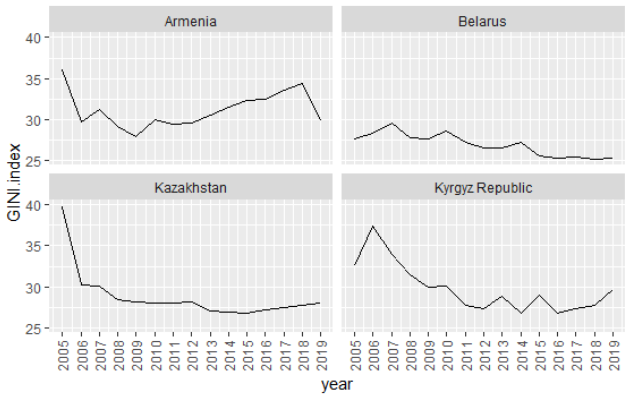


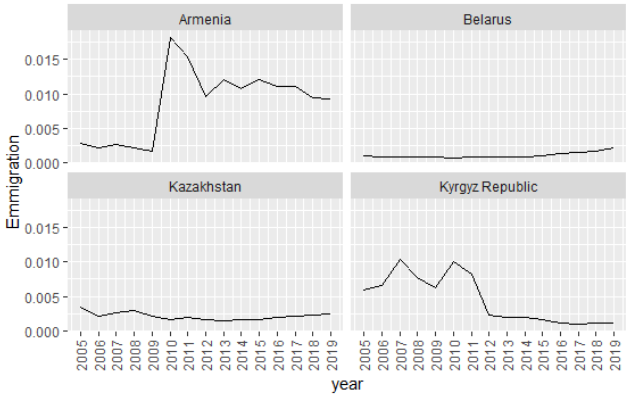


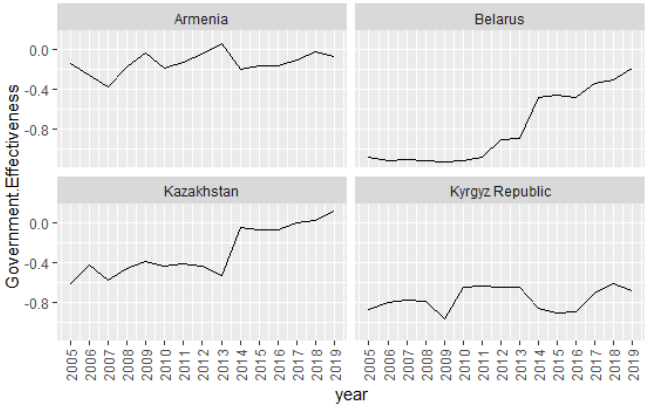





Armenia
Belarus
Kazakhstan
Kyrgyz Republic
Unemployment
year


Armenia
Belarus
Kazakhstan
Kyrgyz Republic
GINI.index
year


Armenia
Belarus
Kazakhstan
Kyrgyz Republic
Emmigration
year


Armenia
Belarus
Kazakhstan
Kyrgyz Republic
Government.Effectiveness
year

Bibliography

Abazov, R. (2010). Central Asia's Skilled Migrants: Brain Drain or Brain Gain?. The Central Asia-Caucasus Analyst, 1-15.

Abzhapparova, A. (2019). The problem of student migration in the Republic of Kazakhstan. Journal of Philosophy, Culture and Political Science, 69(3), 100-109.

Adams Jr, R. H. (2003). International migration, remittances, and the brain drain: A study of 24 labor-exporting countries. World Bank policy research working paper, 30-69.

Baigeldi, B. (2016). Human Resources: Migration Processes in Kazakhstan. Indian Journal of Science and Technology, 9(5), 1-7.

Beine, M., Docquier, F., & Rapoport, H. (2001). Brain drain and economic growth: theory and evidence. Journal of development economics, 64(1), 275-289.

Beine, M., Docquier, F., & Rapoport, H. (2008). Brain drain and human capital formation in developing countries: winners and losers. The Economic Journal, 118(528), 631-652.

Bhagwati, J., & Hamada, K. (1974). The brain drain, international integration of markets for professionals and unemployment: a theoretical analysis. Journal of Development Economics, 1(1), 19-42.

Bokayev, B., Torebekova, Z., & Davletbayeva, Z. (2020). Preventing Brain Drain: Kazakhstan's Presidential "Bolashak" Scholarship and Government Regulations of Intellectual Migration. Public Policy and Administration, 19(3), 25-35.

Bureau of National statistics of the Republic of Kazakhstan, (2000-2020). Main socio-economic indicators of the Republic of Kazakhstan, https://stat.gov.kz/official/dynamic

Carrington, W. J., & Detragiache, E. (1998). How big is the brain drain?.

Carrington, W. J., & Detragiache, E. (1999). How extensive is the brain drain?. Finance and Development, 36, 46-49.

Cervantes, M., & Guellec, D. (2002). The brain drain: Old myths, new realities. Organisation for Economic Cooperation and Development. The OECD Observer, (230), 40.

Cooray, A., Schneider, F. (2016) "Does corruption promote emigration? An empirical examination" Journal of Population Economics 29:1, 293–310.

Docquier, F., & Rapoport, H. (2012). Globalization, brain drain, and development. Journal of economic literature, 50(3), 681-730.

Docquier, F., Lohest, O., & Marfouk, A. (2007). Brain drain in developing countries. The World Bank Economic Review, 21(2), 193-218.

Etzo I. (2011). The determinants of the recent interregional migration flows in Italy: a panel data analysis // Journal of regional science, 51(5). p. 948–966.

Ghatak S., Mulhern A., Watson J. (2008). Inter-regional migration in transition economies: The case of Poland. Review of Development Economics, 12(1). p. 209–222.

Gibson, J., & McKenzie, D. (2011). Eight questions about brain drain. Journal of Economic Perspectives, 25(3), 107-28.

Hurlin, C. (2004). A simple test of the non causality assumption in a heterogeneous panel model. Rev écon, 56(3).

Issabekova, B. M., & Ussina, A. Z. (2018). The Issue of Brain Drain in Kazakhstan. Проблемы устойчивого развития на макро-, мезо-и микроуровне, 91-95.

Kaliaskarova, G., & Zhanpeiisova, K. (2019). The State of Intellectual Migration of youth in the Republic of Kazakhstan. Bulletin d'EUROTALENT-FIDJIP, (1), 67-70.

Kwok, V., & Leland, H. (1982). An economic model of the brain drain. The American Economic Review, 72(1), 91-100.

Lee E.S. (1966) A Theory of Migration // Demography, Vol. 3, No. 1.p. 47-57.

Libman A. (2009) Democracy, Size of Bureaucracy, and Economic Growth: Evidence from Russian Regions / CDSE Discussion Paper, No. 60.

Miyagiwa, K. (1991). Scale economies in education and the brain drain problem. International Economic Review, 743-759.

Miyagiwa, K. (1991). Scale economies in education and the brain drain problem. International Economic Review, 743-759.

Molchanov, M., Baikushikova, G., & Kuzembayeva, A. (2018). Educational migration in Eurasia: new trends. Серия международные отношения и международное право, 82(2), 71-79.

Mountford, A. (1997). Can a brain drain be good for growth in the source economy?. Journal of development economics, 53(2), 287-303.

Mountford, A. (1997). Can a brain drain be good for growth in the source economy?. Journal of development economics, 53(2), 287-303.

Mukhtarova, N. (2010). Brain drain in Kazakhstan in 1999-2008, 28-54.

Nasimova, G., Kaplan, C., Smagulov, K., & Kartashov, K. (2020). Reasons for and factors in educational migration from Kazakhstan. Central Asia and the Caucasus, 21(3), 137-146.

Oberg, S. (1996). Spatial and Economic Factors in Future South-North Migration. W. Lutz (ed.). - Earthscan, London, pp. 336-357

Onyusheva, I. (2017). Analytical and managerial issues of human capital in conditions of global competitiveness: the case of Kazakhstan. Polish Journal of Management Studies, 16.

Rokkan, S. (1974). Entries, voices, exits: Towards a possible generalization of the Hirschman model. Social Science Information, 13(1), 39-53.

Sadovskaya, Y. (2013). Educational Migration from Kazakhstan to China: A Shift Eastward?. Central Asia/Caucasus Analyst.

Skeldon, R. (2009). Of skilled migration, brain drains and policy responses. International Migration, 47(4), 3-29.

Stark, O. (2004). Rethinking the brain drain. World Development, 32(1), 15-22.

Teslenko, A. N., Ibrayeva, A. B., & Sh, R. A. (2017). Double-diploma education in Kazakhstan as a tool of academic mobility of faculty and students. Sociological Studies, 6(6), 138-142.

Wong, K. Y., & Yip, C. K. (1999). Education, economic growth, and brain drain. Journal of Economic Dynamics and Control, 23(5-6), 699-726.

World Bank. (2019). Europe and Central Asia Economic Update, Fall 2019: Migration and Brain Drain.

Zhanpeisova, K., Kaliaskarova, G., Gabdulina, B., & Mukasheva, M. (2020). Brain Drain From the Republic of Kazakhstan as analyzed by political scientists. Central Asia & the Caucasus, 2(4), 714-728.

Zhatkanbaeva, A., Zhatkanbaeva, J., & Zhatkanbaev, E. (2012). The impact of globalization on "brain drain" in developing countries. Procedia-Social and Behavioral Sciences, 47, 1490-1494.

Нурмагамбетов, А., Иватова, Л., & Хасенова, Л. (2021). Образовательная миграция в контексте совершенствования системы высшего образования Республики Казахстан. Казахстан-Спектр, 97(1), 29-45.

Топилин, А. В. (2015). Общии рынок труда и миграция: новые возможности в рамках ЕАЭС. Вестник Самарского государственного экономического университета, (10), 69-76.