# The Estimation of Losses of the Russian Economy from Population Migration to Developed Countries in 2000–2017

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**Abstract:** The problem of emigration of Russian citizens to other countries remained quite acute during 2000-2017. This poses a threat to national security, as there are many economically active young people with a high level of education among the emigrants. Therefore, it is required a comprehensive study of these processes and the creation of conditions for the preservation of human capital in Russia. The authors developed a methodology for assessing the losses of the Russian economy in value terms as a result of emigration of citizens abroad. It is based on the determination of the "cost" of human life and the individualization of this indicator in accordance with the level of economic development of the host country and with the subjective factors of the emigrant, as well as in specifying the number of citizens who left the Russian Federation in accordance with the official data of foreign migration services. As a result of the calculations, it was determined that the losses of the Russian economy from this phenomenon for the period 2000-2017 amounted to more than 545.85 billion USD. Such a situation is unacceptable in the conditions of the country's unfolding competition with other states for the positions of leaders in the new industrial revolution. It is necessary to carry out systematic work to reduce the scale of outgoing flows of international labour migration from Russia.

**Keywords:** Migration, human capital, international labour movement, brain drain, migration policy.

## INTRODUCTION

The problem of international labor migration deservedly draws the attention of scientists, as the labor movement between countries has intensified in the age of globalization and has a significant impact on both the economies of those countries and international economic relations as a whole. The following researchers made a special contribution in the development of this subject: Bauer and Zimmerman (1988), Gibson and McKenzie (2012), Ivakhnyuk (2011). Vartanyan (2014) proposes measures of labor migration regulation and encouraging potential migrants to stay in their country.

Alarco'n (2007), Iontsev, Iontseva and Ryazantsev (2016), Kazantsev and Borishpolets (2013), Kirichenko (2008), Zayonchkovskaya (2004) and other scientists dedicated their works to emigration of highly qualified specialists, otherwise, the so-called "brain drain". As a rule, this phenomenon is described negatively for a donor country compared to labor migration, which has many positive moments for both countries.

The problems of evaluating the "cost" of human life and the cost measurement of human capital can be seen in the works of Sokolov (2010), Zubets, Novikov and Sazankova (2016).

Over the past 20 years, there has been a positive dynamics in the number of international labor migrants. About 60% of them reside in developed countries, while 20% live in the United States alone (Vartanyan, 2014). Every 30th inhabitant of the planet lives outside their birth country (International Organization for Migration, 2018). Labor migration became an important feature of the modern world. Acting as a host country for a large number of immigrants, Russia actively participates in these processes.

Throughout the history, Russia was repeatedly facing mass emigration of its population, losing young and skilled people, including the intellectual elite. Since 1820, about 4 million Russian-born people left the Russian empire, the USSR, and the Russian Federation for the US alone (U.S. Department of Homeland Security, Office of Immigration Statistics, 2016). It is important to note that the situation with emigration within 2000 and 2017 improved compared to 1990-1999. Back then, more than 433 thousand people became permanent residents in the United States which is twice as more than for the past 17 years. Generally speaking, the increased global intensity of migration of highly qualified personnel is a negative phenomenon for developing countries with an highly educated population. This phenomenon leads to an outflow of human capital, although the negative consequences of intellectual emigration from Russia weakened in the 2000s (Didenko, 2015).

The study, conducted by Russian Public Opinion Research Center, revealed that the number of Russia's

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citizens wishing to leave the country decreased. 10% of the population wanted to emigrate in 2017 and 13% in 2015. Young people are more likely to leave for another country: 25% among 18-24-year-olds and more than 15% among 25-34-year-olds. Among the residents of Moscow and St. Petersburg, the rate of potential emigration exceeds 20%. The conducted survey shows that those who consider emigrating to another country nowadays tend to plan it more meaningfully and are in a rush to put their plan in action. Thus, human capital continues to move from Russia for other countries.

## MATERIALS AND METHODS

### Methodology for Calculating the Value Human Capital Loss

A number of efficient system solutions must be developed in order to reduce the scale of this process. An assessment of the economic losses from labor emigration from Russia is important for determining the effectiveness of their implementation. For this purpose, the article contains a methodology for calculating the value human capital loss in value terms as a result of Russians leaving the country for a permanent residence. This technique is based on solving the following problems:

1. To specify the number of Russian citizens who left Russia for permanent residence abroad.

2. To choose a value indicator that reflects the loss of the national economy as a result of an employable individual emigrating to another country.

3. To determine the indirect losses of the Russian economy due to the departure of citizens abroad permanently.

### Data

The indicators of the number of emigrants from Russia mentioned in the official statistical sources cause certain doubts. There are significant discrepancies in the migration statistics of the Russian Federation and other countries. The number of Russian citizens leaving for permanent residence abroad is several times less in the Russia's official data compared to the official foreign data on the number of arrivals to recipient countries.

According to the Federal Service of State Statistics of Russia, about 41.8 thousand of people left for the US from 2000 to 2016. But according to the data provided by the Department of Immigration Statistics of the Department of Homeland Security in the US the number of Russian-born people received the of lawful permanent resident status was more than 231.2 thousand. Therefore, domestic and American indicators differ in 5.5 times. However, the number of educational, tourist or working visa bearers is not taken into account in the foreign data. Even considering that the arrival to the country of destination and the receipt of permanent status of residence may not match in time, the discrepancy in these data is still very significant.

A similar situation can be observed with Russians emigrating to the United Kingdom. From 2004 to 2015, 22.6 thousand Russians became British citizens (UK Visas and Immigration Department of Home Office, 2016), while the Russian official data stated only 3.2 thousand of people, which is 7 times less.

By analyzing the issue with the emigration of Russian citizens to Canada, it is possible to notice another discrepancy in domestic and external indicators. 24.4 thousand of Russians became permanent residents of Canada within 2006 and 2015 (Immigration, Refugees and Citizenship Canada, 2015). The data of the Federal State Statistics Service are as follows: within this period of time, 5.2 thousand of people left Russia for Canada, therefore 4.6 times less. The Canadian immigration policy is generally aimed at favoring the flow of skilled immigrants and focused on meeting the country's socio-economic needs (Garusova, 2018).

Therefore, there are significant differences in estimations of permanent emigrants based on the example of the three mentioned countries. It can be assumed that similar differences to some extent can be observed in the situation with other countries. In total, according to the Federal Migration Service, the number of people who left Russia for non-CIS countries from 2000 to 2017 was 889 thousand. 421.3 thousand of them left for developed countries. After increasing this indicator by 5 times, the value will be equal to 2107 thousand of emigrants.

It should be noted that the number of arrivals from developed countries to Russia for the same period is about 130 thousand. The number is rounded up since there are no specific data on those arrived from Belgium, Denmark, the Netherlands, and New Zealand. But in this case, overestimating the value does not make sense as there is no distortion in the registration

of those who enter Russia conducted by the Federal Migration Service.

**Estimation of Losses «Per Capita»**

In order to solve the second problem, it is possible to use many different methods of estimating the "cost" of average human life, that exist both in Russia and the world. Despite the question of the «cost» being unethical, this topic is sufficiently worked out as a huge number of economists dedicated a lot of works to that since the 1970s. Today, Russia uses ways to measure the "cost" of human life based on:

- Earnings and living standards statistics,

- Estimations of the loss of GDP due to the reduction in the number of employable citizens,

- The willingness of the population to pay for risk avoidance,

- The amount of the risk premium for employees of hazardous occupations,

- The amount of judicial compensation for deaths in industry or transportation,

- Life insurance, etc. (Zubets, Novikov and Sazankova, 2016).

As a rule, these methods are used in calculating the losses of the economy from the death of an individual and are in demand, i.e. the insurance sector. But in this study, it is important to talk about the departure of Russian citizens and the termination of economic activity in the country of the outcome. In our opinion, the most acceptable method for the purposes of this work is based on estimating le loss of part of GDP. Within the framework of this methodology, the "cost" of life can be estimated as the loss for the economy from the emigration abroad.

Multiple developed recipient countries were picked for the analysis. Most of them are members of the Organization for Economic Co-operation and Development (OECD). These countries are the most popular among Russians willing to move permanently. As a rule, migration services of these countries also keep detailed records of migration processes and publish a lot of valuable data for analysis.

It is noteworthy that the migration policy of developed countries regarding to immigrants from Russia is quite strict and in many cases is based on the selection of the most suitable candidates in terms of education age, health, etc. Thus, the selection is aimed at attracting the most qualitative human capital which is close to the features of the average indicators of the recipient country. The immigration of negative human capital from Russia is carefully blocked by migration services of developed countries unless it is illegal immigration. As a result, it can be concluded that the "cost" of life for many citizens leaving Russia for developed countries can be estimated above the average indicators of the host country.

In order to take into account this factor, it is advisable to use a coefficient that reflects the social and economic differences between the "donor" country and the recipient country. For example, this value can be defined as the ratio of human development indices (HDI) or human capital indices.

The connection between the "cost" parameter of human life in monetary terms in the country and a certain index reflecting the quality of human capital was determined through correlation analysis. The correlation of the data on per capita GDP of countries and values reflecting the quality of human capital was evaluated by selecting two indicators: the widely used human development index and the human capital index from "The Global Human Capital Report 2017", World Economic Forum (WEF).

Based on the calculations made based on data from the United Nations and the World Economic Forum (WEF) for 120 states, members of all groups of countries of the world economy. The obtained values are presented in Table **1**.

Based on the values obtained, it is possible to conclude that there is a relation between the indicators of per capita GDP and HDI. It is quite expected, since it is known that the HDI consists of life expectancy at birth, the expected duration of study, and per capita GNI.

The analysis of the independence of per capita GDP and the human capital index from the WEF report showed that this dependence is also weakly stated in the case of nominal per capita GDP and PPP per capita GDP. The fact is that there is a pronounced correlation between the indices of the human development index and the human capital index.

Therefore, we picked the HDI indicator, which is quite strongly related to the value indicator of the "value" of human life. And since it contains indicators of

**Table 1:   Correlation between GDP Per Capita Data of Countries and Values Reflecting the Quality of Human Capital in them**

| First indicator | Second indicator | Multiple correlation coefficient | Coefficient of determination |
|---|---|---|---|
| GDP per capita in PPP, 2016 | HDI, 2016 | 0.7472 | 0,5584 |
| GDP per capita in PPP, 2016 | The human capital index (WEF, 2017) | 0.6145 | 0,3777 |
| GDP per capita, 2016 | HDI, 2016 | 0.7255 | 0,5264 |
| GDP per capita, 2016 | The human capital index (WEF, 2017) | 0.6719 | 0,4514 |
| HDI, 2016 | The human capital index (WEF, 2017) | 0.8476 | 0,7184 |

longevity and education, as well as correlated with the human capital index from the WEF report, it also reflects the situation with human capital in the country. It is the HDI that is to be used to reflect the above differences between the donor and the recipient country. The human development index in Russia in 2016 was 0.804 and 0.926 in Canada. In this case, the correlation coefficient of selection, i.e. the ratio of the human development indices of Canada-Russia can be calculated as follows: 0.92 / 0.804 = 1.114.

To estimate the average value of "life" of an emigrant leaving Russia for a specific host permanently, the following formula should be used:

$$ALC = GDPPC * (ARA - AEA) * C_{HDI}$$

Where *GDPPC* - per capita GDP, fixed price; *ARA* - average retirement age; *AEA* - average emigrant age; $C_{HDI}$ - coefficient if human development index.

The "value" of human life in Russia, calculated for one year, is the annual amount of per capita GDP, i.e. $10113 in 2017. The average age of retirement is approximately 57.5 (despite the facts that this age will undoubtedly increase as many Russians continue to work after reaching the retirement age and a part of the population does not survive until retirement or is unable to work due to disability, etc. Using the official data of the Federal State Statistics Service on the distribution of international migrants in the Russian Federation by citizenship and age groups for 2016 enabled the determination of the average age of emigrants, which is about 35 (based on the analysis of the interval statistical series reflecting the number of retired Russian migrants by age groups, presented in the Bulletin of the Federal State Statistics Service "Population and Migration of the Russian Federation in 2016"). The average of the "lost" life expectancy for the donor country's economy at emigration of a person was then equivalent to 22.5 years. Assuming that the volume of per capita GDP in real prices remains

unchanged, the average "value" of economic losses will be $227,419 as a result of emigration of one person.

After applying the HDI ratio for Canada, it is possible to obtain the following value: 14.1 * 1.114 = 253,345 USD. This is an estimate of the Russian economy's losses at current prices from the permanent emigration of a citizen to Canada.

Of course, these estimates are approximate, since they do not reflect the individual features of an emigrant such as education, age, etc. To solve this problem, it is possible to conduct a more detailed analysis of such features. However, for this purpose, it is necessary to keep a careful record of citizens leaving permanently and to collect data on their personal features reflecting the quality of human capital.

Unfortunately, such detailed information on the qualitative composition of emigrants is not available in the public domain. Therefore, this paper features the already mentioned way of express estimation of the value of "life" of one emigrant regarding their permanent departure.

**Overall Losses**

The loss of the Russian economy from emigration:

$$EL = \sum_{i=1}^{n} ALCi * Ni$$

Where *Ni* – the number of Russian citizens who left for a specific country (i) within 2000-2017 increased 5 times compared with the official data; *ALCi* - average life cost of an emigrant, leaving for a recipient country (i).

According to the calculations, the Russian Federation lost $545.85 bn from 2000 to 2017 due to emigration to developed countries only (Table **2**).

The table also shows losses of the economy with a 4x and 6x increase in the number of emigrants from

**Table 2: Losses of the Russian Economy from Emigration of Citizens to the Developed Countries for the Period 2000-2017 in Value Terms in the Prices of 2017**

| Recipient country | The number of emigrants from Russia (according to official figures), persons | The number of emigrants from Russia (increase of official data), persons | | | The HDI of the recipient country, 2015 | The ratio of HDI | Losses of the Russian economy from emigration of citizens to developed countries for the period 2000-2017 in value terms in 2017 prices (billion USD)) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 4-fold increase | 5-fold increase | 6-fold increase | | | 4-fold increase | 5-fold increase | 6-fold increase |
| Australia | 3 142 | 12568 | 15710 | 18852 | 0.94 | 1.1679 | 3.34 | 4.17 | 5.01 |
| Austria | 1190 | 4760 | 5950 | 7140 | 0.89 | 1.1107 | 1.20 | 1.50 | 1.80 |
| Belgium | 973 | 3892 | 4865 | 5838 | 0.9 | 1.1144 | 0.99 | 1.23 | 1.48 |
| Canada | 6423 | 25692 | 32115 | 38538 | 0.92 | 1.1443 | 6.69 | 8.36 | 10.03 |
| Cyprus | 331 | 1324 | 1655 | 1986 | 0.86 | 1.0672 | 0.32 | 0.40 | 0.48 |
| Czech Republic | 3028 | 12112 | 15140 | 18168 | 0.88 | 1.092 | 3.01 | 3.76 | 4.51 |
| Denmark | 714 | 2856 | 3570 | 4284 | 0.93 | 1.1505 | 0.75 | 0.93 | 1.12 |
| Estonia | 8 578 | 34312 | 42890 | 51468 | 0.87 | 1.0759 | 8.40 | 10.49 | 12.59 |
| Finland | 8212 | 32848 | 41060 | 49272 | 0.9 | 1.1132 | 8.32 | 10.39 | 12.47 |
| France | 3862 | 15448 | 19310 | 23172 | 0.9 | 1.1157 | 3.92 | 4.90 | 5.88 |
| Germany | 266 600 | 1066400 | 1333000 | 1599600 | 0.93 | 1.1517 | 279.31 | 349.14 | 418.97 |
| Greece | 3 578 | 14312 | 17890 | 21468 | 0.87 | 1.771 | 5.76 | 7.21 | 8.65 |
| Ireland | 357 | 1428 | 1785 | 2142 | 0.92 | 1.148 | 0.37 | 0.47 | 0.56 |
| Israel | 34 257 | 137028 | 171285 | 205542 | 0.9 | 1.1182 | 34.85 | 43.56 | 52.27 |
| Italy | 4 614 | 18456 | 23070 | 27684 | 0.89 | 1.1032 | 4.63 | 5.79 | 6.95 |
| Japan | 1 595 | 6380 | 7975 | 9570 | 0.9 | 1.1231 | 1.63 | 2.04 | 2.44 |
| Korea, Republic of | 2 638 | 10552 | 13190 | 15828 | 0.9 | 1.1206 | 2.69 | 3.36 | 4.03 |
| Latvia | 7 187 | 28748 | 35935 | 43122 | 0.83 | 1.0323 | 6.75 | 8.44 | 10.12 |
| Lithuania | 5 599 | 22396 | 27995 | 33594 | 0.85 | 1.0547 | 5.37 | 6.71 | 8.06 |
| Malta | 130 | 520 | 650 | 780 | 0.86 | 1.0647 | 0.13 | 0.16 | 0.19 |
| Netherlands | 1 094 | 4376 | 5470 | 6564 | 0.92 | 1.1493 | 1.14 | 1.43 | 1.72 |
| New Zealand | 730 | 2920 | 3650 | 4380 | 0.92 | 1.1381 | 0.76 | 0.94 | 1.13 |
| Norway | 2 291 | 9164 | 11455 | 13746 | 0.95 | 1.1803 | 2.46 | 3.07 | 3.69 |
| Portugal | 773 | 3092 | 3865 | 4638 | 0.84 | 1.0485 | 0.74 | 0.92 | 1.11 |
| Slovakia | 272 | 1088 | 1360 | 1632 | 0.85 | 1.051 | 0.26 | 0.33 | 0.39 |
| Slovenia | 124 | 496 | 620 | 744 | 0.89 | 1.107 | 0.12 | 0.16 | 0.19 |
| Spain | 4 429 | 17716 | 22145 | 26574 | 0.88 | 1.0995 | 4.43 | 5.54 | 6.64 |
| Switzerland | 911 | 3644 | 4555 | 5466 | 0.94 | 1.1679 | 0.97 | 1.21 | 1.45 |
| Sweden | 1 707 | 6828 | 8535 | 10242 | 0.91 | 1.1356 | 1.76 | 2.20 | 2.65 |
| United Kingdom | 3 770 | 15080 | 18850 | 22620 | 0.91 | 1.1306 | 3.88 | 4.85 | 5.82 |
| USA | 42 268 | 169072 | 211340 | 253608 | 0.92 | 1.1443 | 44.00 | 55.00 | 66.00 |
| Total | 421 377 | 1685508 | 2106885 | 2528262 | X | X | 438.93 | 548.66 | 658.39 |

Russia to developed countries compared to the official data.

The direct losses of the economy in the present and future as a result of permanent departures abroad were estimated. Apart from that, there are still indirect losses linked to the fact that the donor country loses human and financial capital, while the recipient country acquires that. Due to migration flows, the economic situation of the first country weakens, while the other one benefits from that.

## Indirect Losses

In addition, there are also losses of the Russian economy as a result of the simultaneous withdrawal of capital. To some extent, emigrants transfer the value of their accumulated assets in Russia to the country of destination. For example, a family of two is required to have an account balance of 1,512 CAD only to be eligible to immigrate to Canada under the "Federal Skilled Worker Program". It means that each immigrant from Russia is required to have $5975 for their stay at the rate of 0.78 USD per 1 CAD. This value may decrease as the number of family members increases. This applies to many other developed countries.

According to the "Global Wealth Report 2017", an average Russian citizen held $16,773, which is much less than within 2007-2017. This report also features the indicator's median value in 2017, which is $3,919. Despite the fact that the level of property inequality is quite high in Russia, the article relies on the average indicator. This choice is made due to the fact that, as a rule, among Russian emigrants there are many middle class people with relatively big financial and non-financial assets such as deposits, businesses, real estate, vehicles, etc. These assets can be sold before emigration and the proceeds transferred to a new country.

Between 2000 and 2017, the average welfare of a Russian citizen at the average annual dollar exchange rate was $16,472. Assuming that each of the 2,106,885 emigrants converted their assets to a foreign currency (particularly USD), it is possible to estimate the approximate indirect losses from the withdrawal of $34.7 bn by emigrants.

It is also important to take into account that many citizens, who left permanently, do not break their ties with Russia by receiving income from property located in their homeland, as well as other incomes such as social transfers.

In developed countries, business immigration can be based on the "exchange" of residence permits or citizenship for large investments in the economy of the host country. For example, this amount is 2 million CAD and starting from $500 thousand in the US. It is also important to consider that many representatives of the Russian elite actively invest in foreign economies, own businesses there, and their kids live and study in those countries.

## Brain Drain

One of the most unpleasant issues of emigration for the Russian economy is the loss of human capital that is in the biggest demand during the "Fourth Industrial Revolution" and innovative development. Every host country has certainly its own features of migration policy. However, as a rule, a huge number of immigrants are young and employable people with professional skills and are able to speak one or several foreign languages. 80% of immigrants in Canada within 2006 and 2015 were under 45 years old, 60% of them were economic immigrants, 72% spoke either English or French, or even both languages. Among the immigrants of Canada, the distribution of labor status were as follows:

- Higher and middle level managers (21%), experts, and representatives of working jobs (i.e. having specialized secondary education).

- Students (21%). Those are young members of emigrant families, foreign students. One of the most common ways of obtaining permanent resident status is studying in the host country and the subsequent job search.

- 3.2% were unskilled workers.

- Retired (4.1%).

- Unemployed for various reasons (19.3%).

- Immigrants with an unconfirmed skill level (28.7%). It is unknown if they possess it or not though (Immigration, Refugees and Citizenship Canada, 2015).

In the Unites States, 65.1% of Russians from 25 to 65 years old have higher and 19.5% have secondary special education. This level is better only among immigrants coming from India (Didenko, 2015). Thus, the higher education and working skills of Russian immigrants to other countries, as a rule, are quite high.

One of the serious problems for the Russian economy is the emigration of experts in information telecommunications technologies. They are mobile enough due to their specific knowledge and skills. Unfortunately, there is an outflow of extra-skilled personnel. Since 2009, among immigrants from Russia only in the United Kingdom there were 2,222 "High Value Migrants", i.e. people with worldwide recognition in their activities (UK Visas and Immigration Department of Home Office). There is also a problem of illegal immigration and "living two countries". There is a large number of Russian people who leave for permanent residence or spend considerable time abroad but are not in the Federal Migration Service Statistics. Emigration statistics in Russia do not consider emigrants who retain Russian citizenship. These people go to developed countries, but they are not being removed from migration records and retain their status and real estate in Russia.

It should be noted that Russia also attracts international labor migrants, which significantly contributes to the country's economy. The income of the Russian economy in 2013 from hosting labor migrants is estimated at \$5-9 bn and the GDP produced by them in 2010 was about \$48 bn (Federal Service of State Statistics of the Russian Federation, 2018). Unfortunately, the level of education of most immigrants to Russia is lower than that of emigrants. 13-17% of immigrants have higher and incomplete higher education (UK Visas and Immigration Department of Home Office, 2016).

## RESULTS

The assessment shows that the Russian economy lost \$545.85 bn from 2000 to 2017 due to emigration. Meanwhile, indirect losses were not taken into account.

Thus, emigration from Russia to developed countries still takes place which is not favorable. Emigration of young and educated citizens along with their children causes serious damage to the country. Another problem caused by emigration is that, as a rule, those emigrants are active, determined, and purposeful people with passion, which is needed for the implementation of reforms and economic development. Since the migration policy of developed countries rejects unwanted people, at least for those who come from Russia, those who leave Russia are, as a rule, law-abiding and inclined to building up people. Their loss reduces the chances for Russia's innovative development. At the same time, they improve the economic and demographic situation in other countries.

Migration processes are certainly a complicated and ambiguous phenomenon. With a lot of negative effects for the country of origin, some positive results can also be identified. In some cases, emigrants would particularly come home with new acquired knowledge and expertise. Others transfer money to their relatives. For many countries, the presence of national diasporas is a positive institutional factor for the expansion of international economic relations. The outflow of citizens with negative views to the existing political and economic situation can be a certain advantage from emigration for the authorities. Nevertheless, the negative effects, are more critical.

Nowadays, international labor migration has proven to be a common phenomenon. Nevertheless, it is important to seek the attraction of foreign qualified immigrants to Russia and reduce the emigration of Russian citizens to other countries to increase the development of the country's economy. A certain number of social economic measures must be implemented, particularly:

1. To continue the development of democratic institutions, as well as to ensure security, rights, and freedom of citizens.

2. To invest considerable funds on the education and science development, ensuring the prestige of working in these areas by material and other factors.

3. To prioritize finding ways to increase the HDI and the development of human capital for the upcoming years and ensure their implementation with the necessary financial and administrative resources.

4. To ensure the creation of new high-performance jobs and increase the income level of qualified professionals.

5. To increase the attractiveness of working for small and medium-sized enterprises and their protection.

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