

# ANALYSIS OF CURRENT TRENDS OF EMPLOYMENT DIVERSIFICATION AT THE INTERNATIONAL LEVEL: CASE STUDY OF PHARMACY INDUSTRY

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## Abstract.

The aim of the study is analysis of current trends of employment diversification at the international level in order to reduce unemployment as much as possible in the future. Manufacture of machinery and equipment, processing of agricultural produce, chemical industries, extraction and export of oil, gold, platinum, etc. make up the biggest part in the structure of GDP and employment. However, manufacturing sector in these countries remains resource-based and peripheral. The biggest challenge of the economic policy in these countries is structural transformation of economy, promotion of investments into high-production sectors in the first phase and subsequent transfer of profits into labor-intensive and low-production industries in the second phase. The current trend in the area of employment diversification at the international level is determined by the changing environment and communication patterns. The controversial nature of issues of employment diversification is explained by their growing significance on the global scale. Continental countries and mainly South European countries are dealing with the most challenging unemployment problems, such as youth unemployment. Rigid employment laws result in the situation where women and young people often become recipients of unemployment benefits. In the recent decades these countries have been making efforts to de-regulate labor markets allowing the employers to conclude fixed-term employment contracts, contracts for piece-rate work, part-time work, etc.

**Keywords:** analysis, unemployment, diversification, employment, investment, organizational and design innovations, infrastructure, international level, insurance, finance, human capital, efficient logistics, pharmacy industry.

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## 1. INTRODUCTION

Resource-based economies typically have developed extracting, heavy and chemical industries and underdeveloped labor-intensive processing industries. These countries tend to omit the stage when large percentage of workers are employed in cheap labor-intensive sectors, which requires not only availability of workforce at a low cost but also general low cost of living. The benefits of extracting industries do not spread among large portions of population, thus limiting the domestic demand. The employment diversification strategies in these countries among other focus on creation of new jobs, including jobs with low labor productivity in poorly development sectors, such as housing and infrastructure construction, education, healthcare and social security, utilities, finance, tourism and other.

In the majority of countries belonging to the second group informal employment in the private sector prevails (Heintz 2008), meaning that standard labor market models and respective conclusions are applicable only to the formally employed part of the population. Low income and high poverty rate are expected consequences of informal and agricultural employment. Concentration of workforce in the

sectors with low labor productivity leads to persistent poverty (Davis et al. 2002).

One of the key factors ensuring success in export expansion is the ability of small and medium businesses of developing countries to continuously increase technological force, acquire new technologies, introduce organizational and design innovations.

The most prosperous commodity-dependent countries are the countries with sustainable political stability investing both in capital-intensive sectors with high-skilled labor, efficient logistics, infrastructure, finance and insurance and in the development of the human capital – education, professional training, healthcare (Crespi et al. 2011). In these countries the roles of state and social contract are very important, which translates in carefully thought-through taxation and social security policies, public procurement, management of public companies, incentives for technologies and innovations.

For the countries in the third and fourth groups the most pressing issues include de-industrialization and expansion of tertiary sector. Rapid decline of employment in manufacturing industries produced a lot of unemployed people which need to be integrated into the growing service

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sector. However, almost every developed market economy has faced the problem of structural long-term unemployment. As a result of de-industrialization low-skilled jobs were outsourced to low-wage countries or replaced by automation. Those who lost their jobs in manufacturing experience difficulties adapting to other labor market sectors. The skills acquired during years in manufacturing are not easily transferrable into tertiary sectors.

In the second half of the 20<sup>th</sup> century low-skilled workforce concentrated primarily in processing industries. The technologies enabled to increase labor efficiency and consequently the wages making the latter consistent with the wages of the rest of the population. The trade union movement also contributed to ensuring comfortable life.

However, nowadays low-skilled workers are mainly employed in low value-adding services such as retail sales, utilities, public catering, etc. or are unemployed. Labor productivity in low value-adding sectors does not show significant growth, which means that in countries where wages are formed by market mechanisms low-skilled workers are at risk of poverty (USA, Great Britain, Switzerland) (Bonoli 2006).

Starting from the 1980s countries with liberal labor market such as Great Britain and Switzerland are facing the problem of “poor working people” who despite being employed, often full-time, have the income below the poverty line. In the post-war years such phenomenon would have been unthinkable. Today employment income alone is sometimes not enough to ensure comfortable life, especially for the families with children or single parents.

### 2. LITERATURE REVIEW

Leading Russian and foreign scholars have been and will continue to study the issues of employment diversification at the international level (Petrov et al. 2019, Kiseleva et al. 2019, Turishcheva et al. 2019, Ponomareva et al. 2019, Terenteva et al. 2018, Kevorkova et al. 2019, Nikiforova 2016).

We can mention the following most relevant and advanced studies dedicated to the analyzed topic:

Heintz J., Pollin R. contemplated the employment-targeted economic program for African countries (Heintz 2008).

Crespi G., Tacsir E. studied effects of innovation on employment in Latin America (Crespi et al. 2011).

Bonoli G. wrote about adapting employment policies to post-industrial labor market risks (Bonoli 2006).

Korner T. in 2008 published a paper on labor market trends and measurement problems in Germany (Korner 2008).

Kumar A. et al. drew attention to rural employment diversification in India and studied trends, determinants and implications on poverty (Kumar et al. 2011).

Islam N. studied the issues of non-farm sector and rural development (Islam 1997).

Narayanamoorthy A., Rodrigues Q., Phadnis A. studied determinants of rural non-farm employment and conducted an analysis of 256 districts (Narayanamoorthy et al. 2002).

Fisher T. dwelled on the significant role of non-farm employment and enterprises in rural India (Fisher 1995).

Other significant scientific research works dedicated to the problem of unemployment include the papers by A. Brown (Brown 1997), O.V. Efimova (Efimova et al. 2019), A.M. Petrov (Petrov et al. 2019, Kiseleva et al. 2019, Muravitskaya et al. 2019, Sotnikova et al. 2019, Karpova et al. 2019), T.B. Turishcheva (Turishcheva et al. 2019, Ponomareva et al. 2019), V.V. Shnaider (Terenteva et al. 2018), Zh.A. Kevorkova (Kevorkova et al. 2019), E.V. Nikiforova (Nikiforova 2016, Igibayeva et al. 2020), A.A. Bakulina (Chernysheva et al. 2019), M.N. Tolmachev (Kosolapova et al. 2019), R.P. Bulyga (Bulyga et al. 2019), Yu.E. Putikhin (Putihin et al. 2019), O. Gorodetskaya (Gorodetskaya et al.

2019), O. Rozhnova (Rozhnova et al. 2019), O. Efimova (Efimova 2018), N. Sapozhnikova (Sapozhnikova et al. 2019), G. Fedotova (Fedotova et al. 2020), V. Barilenko (Barilenko et al. 2019), J. Gnezdova (Gnezdova et al. 2018), O. Gavel (Gavel et al. 2018), N. Semenov (Semenov et al. 2017), N. Prodanova, (Prodanova et al. 2019), E. Alekseicheva (Alekseicheva et al. 2019), A. Mayorova (Mayorova et al. 2020), I. Komissarova (Komissarova et al. 2019), Z. Kevorkova (Kevorkova et al. 2018), E. Tereshchenko (Tereshchenko et al. 2017), A. Glotko (Glotko et al. 2020), M. Melnik (Melnik et al. 2020).

### 3. HYPOTHESES

The current trend in the area of employment diversification at the international level is determined by the changing environment and communication patterns. The controversial nature of issues of employment diversification is explained by their growing significance on the global scale. Continental countries and mainly South European countries are dealing with the most challenging unemployment problems, such as youth unemployment. Rigid employment laws result in the situation where women and young people often become recipients of unemployment benefits. In the recent decades these countries have been making efforts to de-regulate labor markets allowing the employers to conclude fixed-term employment contracts, contracts for piece-rate work, part-time work, etc.

In this paper we used monographic, statistical methods of analysis and synthesis as well as benchmarking, grouping, comparison, observation and inspection.

Analytical data are represented in tables, figures and diagrams.

The conclusions are mainly based on the data obtained by generalization, grouping and statistical methods which allow to accurately evaluate the current trends on international employment diversification.

New unconventional employment forms are oftentimes poorly protected by social security programs, most of which were developed in the post-war years of the 20<sup>th</sup> century. In the majority of Western European countries retirement benefits are effective for those who worked full-time throughout the entire work life. Meanwhile, part-time employment usually leads to reduced retirement rights and suspended occupational career during the periods of childbirth. New unconventional career paths in a few decades may result in poverty among elderly people.

Current economic environment in many developed countries shows a persistent trend towards informal employment. The number of self-employed people has grown, slight increase has also been registered in the number of unpaid workers in family companies (Korner 2008). All social and age groups show increasing part-time employment with the majority of part-time workers entitled only to limited social benefits. The phenomenon of part-time and informal employment is very wide-spread among immigrants, low-skilled workers and the age group from 15 to 24 (McIntosh 2008).

The Statistics and database section on the official website of the International Labor Organization (ILO) contains data on employment categorized by gender, occupation, type of job, hours in a work week, etc. The division of the world's population by occupation in 2018 was made based on the data from 95 countries, in 1998 – from 83 countries.

The classification by occupation for the year 2018 lacks the data from such large labor markets as China and India. The data of Canada, New Zealand, Indonesia and Paraguay are provided by industry groups, such as agriculture, processing industries, mining, electric power, gas and water supply, construction, sales, transport, housing and food service, services for business, public administration, public, social and other services.

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The data on the division of labor market by economic activities in Jamaica, South Africa and Columbia have been provided according to the third revision of the International Standard Industrial Classification of All Economic Activities (ISIC-Rev.3), while the data from the majority of other countries have been provided according to the fourth revision (ISIC-Rev.4).

The year 1998 presented similar problems related to lacking or incomparable data. The data from China are available, but only in the aggregated form, divided by the sector:

agriculture, industry, service. No data from India for the year 1998 are available. Over 70% of countries provided their data according to the third revision of the International Standard Industrial Classification of All Economic Activities (ISIC-Rev.3), meanwhile other countries kept to the second revision (ISIC-Rev.2).

In the table below instead of the lacking values for 1998 and 2018 for India and China we used the values registered in these countries in the years 2000 and 2017 respectively (Table 1).

**Table 1:** Number and composition of employed population in the countries of the world in 2018 and 1998\*

Countries	2018		1998	
	thous. people	% of the world's total working population	thous. people	% of the world's total working population
China	776,000*	31.4	706,370	37.6
India	360,574	14.6	327,037**	17.4
United States	155,761	6.3	132,969	7.1
Indonesia	125,536	5.1	87,672.449	4.7
Brazil	90,764	3.7	64,725.811	3.4
Russian Federation	72,532	2.9	58,464	3.1
Japan	66,640	2.7	65,140	3.5
Pakistan	59,794	2.4	–	–
Viet Nam	54,250	2.2	36,954.303	2.0
Mexico	53,721	2.2	36,355.58	1.9
Germany	41,915	1.7	35,536.9184	1.9
Philippines	41,157	1.7	–	–
Thailand	37,865	1.5	32,137.6	1.7
United Kingdom	32,354	1.3	27,050.8375	1.4
Turkey	28,734	1.2	–	–
France	27,122	1.1	22,248.231	1.2
Korea, Republic of	26,925	1.1	–	–
Iran, Islamic Republic of	23,813	1.0	–	–
Other countries	394,717	16.0	248,077	13.2
Total of the above countries	2,470,171	100.0	1,880,739	100.0

Source: Calculated based on the data of the International Labor Organization (ILO) – Internet – Available at: <https://ilostat.ilo.org/data/> (Accessed March 1, 2020).

Total number and composition of the employed population in 1998 was calculated based on the available official information and contains numerous omissions. In 2018 the total number of employed persons amounted to 2,470,171 thous. which is by 589,432 thous. or 31.34% more than in 1998. Average annual increase of employed population in 1999-2018 was 1.37%.

The largest portions of the world's employed population live in China (31.4% in 2018) and India (14.6% in 2018). However, the specific weight of these countries in 1999-2018 decreased by 6.1% and 2.8% respectively.

The contribution of the USA into the world's employment rate in 2018 equaled 6.3%, Indonesia – 5.1%, Brazil – 3.7, the Russian Federation – 2.9%, Japan – 2.7%.

For evaluation of the diversification rate we used the modified Herfindahl-Hirschman Index (H):

$$H = 1 - \sum_{i=1}^n d_i^2$$

where  $i$  – numerical order of the country;  
 $d$  – share of the  $i$ -country in the world's total employed population,  
 $n$  – number of countries.

The value of the modified Herfindahl-Hirschman Index closes to 0 indicates mono employment (employment only in one country of the world, which is unrealistic). The index value close to 1 means that people are employed in a big number of countries.

The value of the modified Herfindahl-Hirschman Index

showing the distribution of the employed population among countries in 2018 equaled 0.8667, in 1998 – 0.8159. These figures indicate that the employed people are dispersed among countries and that employment diversification has grown.

The total number of countries is significantly more than one and the value of the modified Herfindahl-Hirschman Index will grow moving further away from zero. Maximum value for 97 countries in 2018 is:

$$\max(H)^{2018} = 1 - \left(\frac{1}{97}\right)^2 \bullet 97 = 0.987$$

Maximum value for 85 countries in 1998 would have been:

$$\max(H)^{1998} = 1 - \left(\frac{1}{85}\right)^2 \bullet 85 = 0.988$$

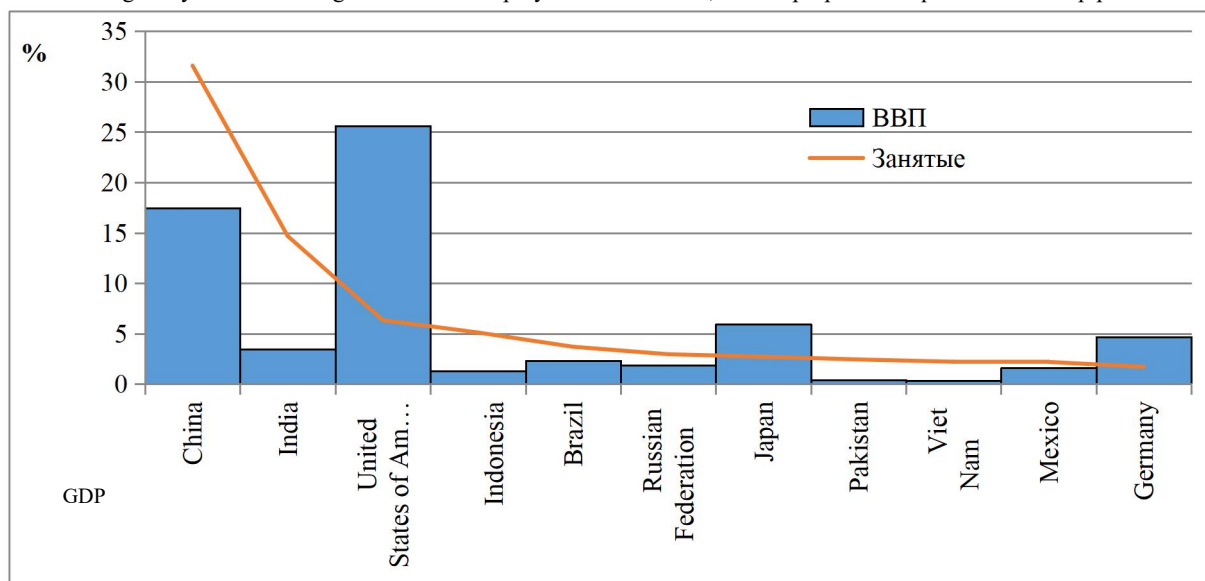
As shown above maximum values are very close to one and the difference in the total number of countries by 12 influences the result in a rather small degree.

Closeness of the actual values of the modified Herfindahl-Hirschman Index to the upper limit is an evidence of substantial diversification. However, the large number of countries predetermined the conclusion. To eliminate the factor of big number of countries it is appropriate instead of calculating indicators of centralization and their inverse values to examine qualitative parameters of concentration using the Gini coefficient and the Lorenz curve.

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The value of the Gini coefficient was calculated for the countries arranged by the increasing number of employed

China's share in the total GDP amounted only to 17.5%. Thus, the disproportion equals minus 14 p.p. or in relative



persons using the formula:

$$G = 1 - 2 \sum d_x d_y^h + \sum d_x d_y$$

and for the year 1998:

$$G_{1998} = 1 - \frac{1}{85} - \frac{2}{85} \sum d_y^h = 0.8557$$

The values of the Gini coefficient and the constructed Lorenz curve indicate large disbalance in distribution of the employed population among countries. The disbalance in 2018 is slightly smaller compared to 1998.

### 5. RESULTS

Comparing the structure of the employed population in the analyzed countries with the total value of the GDP produced by these countries, we see that even though in 2018 China contributed 31.5% to the total employed population, the

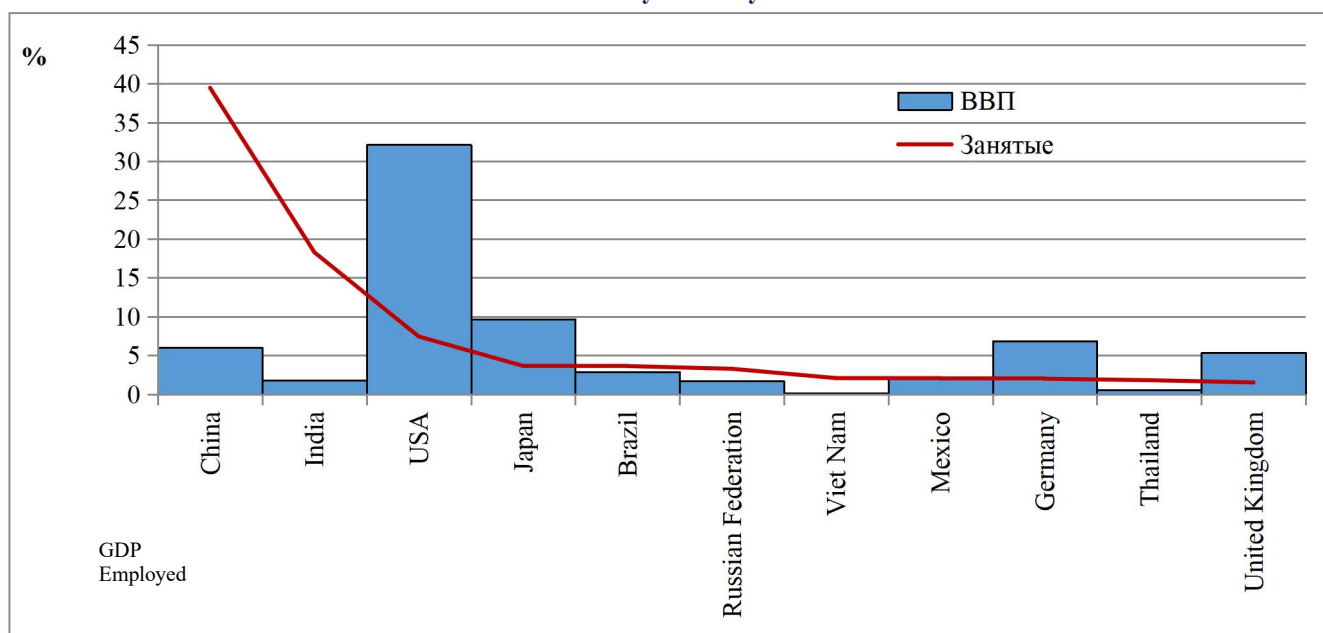
values – 0.45 shares from the specific weight of the employed population. Even greater disproportions can be traced for India and Indonesia – minus 0.76 and 0.74 shares respectively. For the Russian Federation and Brazil, the absolute deviation amounts to a little more than one percentage point (minus 1 and 1.4 p.p.), while in relative values – 0.37 shares.

At the same time the USA's specific weight in the total value of the GDP produced by the examined countries (25.6%) exceeds the specific weight of this country's employed population in the world's total employed population (6.3%) by 19.3 p.p. or three-fold. Similar trends are shown by other countries with the developed economy, such as Japan (by 3.2 p.p. or 1.18 times), Germany (by 3 p.p. or by 1.73 times) and Great Britain (by 2.7 p.p. or 2.1 times). The correlation between the specific weights of the employed and the GDP values among the major countries in 2018 is represented by Figure 1.

**Figure 1.** Correlation between the specific weights of the employed and the GDP values among the major countries, 2018

If we compare the specific weights of the employed and the GDP values among the major countries in 1998, we will see that the developing economies of such large countries as China, India and the Russian Federation displayed even greater disproportions (Figure 2).

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**Figure 2.** Correlation between the specific weights of the employed and the GDP values among the major countries, 1998.

These disproportions can be represented by the Lorenz curve, if we will arrange the countries in the order of increasing specific weight of the employed population and add the data on specific weights of the GDP values. The distance between the curve of the employed and the curve of the GDP values in 1998 was bigger than in 2018.

The same can also be proven in mathematical terms by subtracting from the previously calculated Gini coefficient of the employed population the GDP Gini coefficient calculated for the countries arranged according to the number of the employed:

$$\Delta G_{2018} = G_{2018}^{Empl} - G_{2018}^{GDP} = 0.8186 - 0.7463 = 0.0723;$$

$$\Delta G_{1998} = G_{1998}^{Empl} - G_{1998}^{GDP} = 0.8557 - 0.7503 = 0.1054;$$

Therefore, in the period from 1999 to 2018 the diversification grew and the disproportions both in terms of the employed population and the produced GDPs decreased. Labor productivity in the examined countries with due account of the number of the employed people evened out. If we ignore the fact that the numbers of the employed population in the analyzed countries differ and calculate the average labor productivity using the simple arithmetic mean formula  $x = (\sum x_i) / n$ , we will see that the average labor

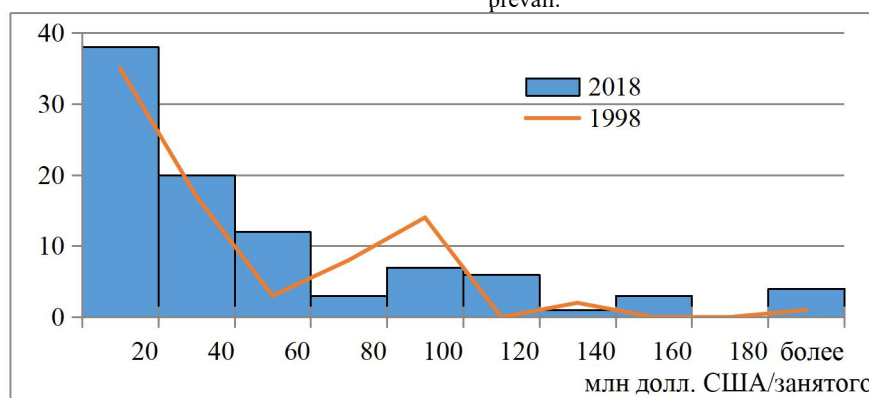
productivity per one employed person in 1998 was thous. USD 39.6 and in 2018 – thous. USD 44.7 in the prices of the year 2015. The value of the mean square deviation ( $\sigma$ ) also calculated with an outweighed formula shall be thous. USD 38.4 and 43.5 per one employed person in the prices of 2015, variation coefficients shall equal ( $V = \sigma/x \cdot 100\%$ ) 97.05 and 96.95%, which may lead to a false conclusion on unchanged labor productivity in all countries of the world.

It is methodologically correct to calculate the mean labor productivity ( $w$ ) using the formula below:

$$w = \frac{\sum_{Employed} GDP}{\sum_{Employed} w-Empl} = \frac{\sum_{w-Empl}}{\sum_{Employed}}$$

In this case the calculations show that the average labor productivity per one employed person in 1998 was thous. USD 22.1 and in 2018 – thous. USD 31.2 in the prices of 2015. The mean square deviation of the labor productivity per one employed person with due account of the number of employed people in the examined countries in 1998 equaled thous. USD 31.7 and in 2018 – thous. USD 35.2 in the prices of 2015. Consequently, the variation coefficients shall decrease to 143.4% in 1998 and to 113.0% in 2018.

In general, the countries show non-uniform distribution of labor productivity (Figure 3). We cannot a distinct right-side asymmetry – the countries with low labor productivity prevail.



**Figure 3:** Distribution of major countries by labor productivity in 1998 and 2018

The largest labor productivity in 2018 was registered in the following countries: Luxemburg, Ireland, Switzerland, Singapore, Norway, the United States of America, Denmark,

Australia and other countries with developed economy (Table 2). In the Russian Federation in 2018 the labor productivity per one employed person amounted to thous.

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USD 19.6 in the prices of 2015, which is 37% less compared to the average level among other countries.

**Table 2:** Labor productivity in the countries of the world (thous. USD per 1 employed person in the prices of 2015)

Country	Labor productivity
Luxembourg	226.5
Ireland	156.6
Switzerland, Liechtenstein	156.2
Singapore	153.3
Norway	150.5
United States of America	125.9
Denmark	113.8
Australia	106.4
Sweden	105.6
Iceland	102.3
Belgium	102.1
Finland	99.3
United Kingdom	95.3
Russian Federation	19.6
China	17.2
India	7.4
Tajikistan	4.6
Vietnam	4.3
Gambia	3.5
Kyrgyzstan	3.2
Mali	2.7
Average	31.1

The skewness coefficients among the countries calculated taking into account the number of the employed people in 1998 and in 2018 equaled 2.022 and 2.256 respectively:

$$AS_{1998} = \frac{\sum (\omega - \varpi)^3 \text{Employed}}{\sum \text{Employed}} \quad /$$

$$\frac{\sum (\omega - \varpi)^2 \text{Employed}^{\frac{3}{2}}}{\sum \text{Employed}} = 2.022$$

$$AS_{2018} = 2.256.$$

The coefficients exceed 2 in absolute magnitude, providing another evidence of the strong right-side asymmetry which only grew in 1999-2018.

Based on the values of the kurtosis coefficients we can state that the distribution of labour productivity among countries has a peaked character – the situation that only intensifies over time:

$$Ek_{1998} = \frac{\sum (\omega - \varpi)^4 \text{Employed}}{\sum \text{Employed}} \quad /$$

$$\frac{\sum (\omega - \varpi)^2 \text{Employed}^2}{\sum \text{Employed}} - 3 = 2.631$$

$$Ek_{2018} = 3.413$$

The median values of labor productivity per one employed person, calculated without consideration of different numbers of the employed in the countries, in 1998 amounted to thous. USD 21.96 and in 2018 – thous. USD 32.85 in the prices of 2015. However, if we arrange countries by the values of labor productivity and take into account the number of the employed in each country, the employed person in the very middle shall be a Chinese citizen both in 1998 and in 2018 with the labor productivity per one employed person of thous.

USD 3.35 and thous. USD 17.24 in the 2015 prices.

### 6. DISCUSSION

For the first group of countries the main employment diversification objectives include:

- transition from agricultural economy with low labor productivity to high-capacity, high-technology and export-focused farming industry (Rooney et al. 2019);
- employment diversification in rural areas meaning employment of people in rural areas in non-farm economic activities (Kumar et al. 2011);
- development of manufacturing industries.

This group of countries experienced a transition from agricultural activities to wholesale and retail trade with high degree of informal employment and also a slight transition towards manufacturing industries. In general, the structural changes related to manufacturing sector proved to be insufficient to promote growth of jobs on a large scale.

The difficulties in the field of structural changes and transition towards manufacturing are explained by insufficient “industrial knowledge” or “technological know-how” in these countries. Acquisition of technological know-how is associated with big costs and new technologies are often not easily transferrable to other countries. The more complex the technology, the more difficult it is for a country to acquire it and use in the manufacturing.

The countries producing and exporting low-tech goods and services have limited possibilities for diversification compared to the countries producing high-tech goods. This comes as a result of closer interconnection between complex goods compared to simpler goods.

The production and export of the countries of the first group is made up of the low-tech products, such as tea, coffee, wood, cut flowers, fish, etc. The primary objective in these countries is to launch connected and more high-tech productions which will use the available resources.

Among the options for employment diversification in rural areas are upgrading of the skills and increasing the share of people employed in non-farm businesses. It has been established that secondary education induces the development of entrepreneurial potential, while elementary education increases labor productivity. Education of the members of the family who are not directly involved in the business also produces a positive effect in the form of new ideas, advice and recommendations, family businesses with self-employed workers also gain advantages from education regardless of the sector and location of their farm business. Positive correlation between literacy and employment in sectors other than agriculture was noted in a number of scientific papers, including in the works of Narayanmoorthy (Narayanamoorthy et al. 2002), Fisher (Fisher et al. 1995) and other (Muravitskaya et al. 2019, Sotnikova et al. 2019, Karpova et al. 2018, Chernysheva et al. 2019, Kosolapova et al. 2019, Putihin et al. 2019, Igibayeva et al. 2020, Bulyga et al. 2019).

Rural non-farm sector encompasses all types of economic activities with the exception of crops, livestock, fishery and hunting. This sector includes such activities as fishery and aquaculture, processing industries, mining, construction, trade, transport and communication, utilities and private services in rural areas.

Agriculture alone cannot maintain growing rural communities. Therefore, the majority of rural communities in developing countries derive livelihood from other sources as well. For a number of economic, social and ecologic reasons cities cannot continuously experience high rates of migration flow from rural areas. As a result, migrants from rural areas end up doing low-paid low-skilled or very hard jobs or become unemployed. This urbanization pattern leads to growing slums, poverty, malnutrition and high crime. On the

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other hand, employment in non-farm businesses in rural areas will reduce the load on traffic and infrastructure of big cities (for example, take the pressure off of housing, transport systems, education, etc.). Development of non-farm economic activities in rural areas is an important mechanism to even out inequities between urban and rural areas and improve the current employment diversification trends.

### CONCLUSION

In conclusion it should be noted that all post-industrial countries are now facing the problem of aging population which results in the need to attract foreign workforce. Among major drawbacks of active labor migration policy are high social and economic costs associated with integration of foreign workers with different cultural backgrounds and languages. The integration costs are higher for low-skilled foreign workers coming from less developed countries, who not only create higher load on budget and education systems but may cause social tensions and conflicts.

Employment diversification among the poor requires public investment in schools, educational institutions, hospitals, road construction, irrigation systems and other elements of social and economic infrastructure. Funding: The research was funded by the government of the RF as part of the project: "Ensuring of employment diversification and development of mechanisms to support business initiatives of the population".

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