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Human Resources in the World

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Abstract

This paper is devoted to the topic of labor in the economy. The dynamics and structure of labor resources and factors of its change, as well as the labor resource requirements for the economy and the factors of its change are considered. The volume of labor resources depends both on internal (changes in the birth rate, increase in life expectancy), and on external factors (labor migration). In turn, the structure of the workforce depends on the degree of well-being and the level of education. Also, labor resources are influenced by an increase in the active life span and an increase in the tendency for the participation of older persons in the work. The needs for labor resources are determined by the type of economic development (intensive or extensive), the stage of economic development (agrarian, industrial and post-industrial) and the level of automation, computerization and mechanization.

Keywords: Abor resources, migration, population aging, unemployment, the economic growth;

1. Introduction

In recently, the topic of labor in the economy is becoming very important. A decrease in the birth rate and an increase in the average life expectancy in the developed countries of the world lead to an aging population, a decrease in the proportion of the able-bodied population and an increase in the burden on the social system. The increase in the average life expectancy and the aging of the population made it an actual question of the greater involvement of people of older age groups in working life.

A high birth in combination with a weak economy leads to an excess of labor resources in developing countries, which in turn generates massive labor migration.

Economic development and the transition from one type of economy to another gradually reduce the need for labor force.

The transition from an extensive to an intensive type of economic development, as well as mass automation, computerization and mechanization required an increase in the qualification of labor resources.

The gradual transition from the agrarian economy to the industrial one, and then to the postindustrial one, changed the nature of the jobs, reducing the share of manual labor and increasing the share of mental labor.

2. Aging and employment

According to the studies of V. Vandenbergh, F. Waltenberg and M. Rigo, on the basis of the production function, there is a negative correlation between aging of the able-bodied population and productivity of labor. The increase in the proportion of the elderly population (aged 50-65 years) in the total able-bodied population by 10% leads to a decrease in labor productivity by 2.2-2.7%. According to their studies, even a reduction in wages and costs for older workers will not be able to compensate for the decline in labor productivity. On the contrary, taking into account the lower productivity of labor, the profitability of using the elderly population is reduced even with the possible lower wages. In this regard, hiring of older workers from the point of view of the employer is unpromising. This conclusion is confirmed by statistics on the low percentage of employed people among older age groups: according to Eurostat data, only 37% were employed in Belgium in the age group 50-65 years in 2010. Therefore, in the opinion of skeptics, the use of the elderly population will not have a significant significance for the labor market. Optimists believe that the possibility of retraining in combination with greater qualifications can improve the productivity of workers in older age groups. In this regard, optimists urge firms to invest more actively in retraining older workers. However, studies of scientists confirm the opinion of skeptics that the effectiveness of training older workers is much lower than that of younger workers, and strengthened training cannot stop the decline in labor productivity with increasing age [1-7].

There are also studies on the aging effect of the female part of the able-bodied population on the labor market. According to demographic studies, the proportion of women in the older age groups of the able-bodied population increases due to lower mortality, therefore aging of the able-bodied population has a certain gender peculiarity. Studies have shown that for women, the decline in labor productivity and, accordingly, the gross profit of employers as a result of increasing age is more significant than for men. Optimists assumed that the negative effect of the decline in the productivity of women's work can be compensated by the wide development of the service sector. However, more detailed studies have shown that in the service sector, a similar trend is observed in the decrease in the income from women's employment with an increase in their age [1-7].

According to medical research Skirbekk in 2008 and Ours in 2009, individual skills and abilities sharply decrease with increasing age. In this regard, many experts express the fear that aging of the able-bodied population in developed countries will lead to a general decline in labor productivity and, as a consequence, a decrease in well-being. However, the studies of Aubert and Crépon in 2006, Malmberg in 2008, Börsch-Supan and Weiss in 2011 showed that with an increase in the proportion of older workers in the firm, there is not necessarily a decline in productivity. According to Lallemand, Rycx, Göbel and Zwick, there are differences between the performances of the same age groups in different firms. However, the differences between age and productivity do not depend on the size of the institution, sector of the economy, skills and age structure of employees. In connection with the aging of the able-bodied population in some developed countries, a special personnel policy towards elderly people began to be implemented. This personnel policy includes 5 parts: specific equipment for jobs for older employees, reduction of working hours, individual jobs and special training. Studies have shown that when creating special jobs and certain types of work for the elderly, their productivity is higher than in the absence of such specialized jobs. However, special training and reduced working hours for older workers do not have a significant impact on their productivity. Also, the use of working groups of mixed composition does not lead to an increase in the productivity of older workers [1-7].

3. Change in the structure of employment in developed countries

In developed countries, the process is under the conventional name "subprogram shift of technologies": the share of manual and routine labor operations decreases and the share of analytical and non-standard labor operations increases. However, this process is uneven in different countries and is associated with a change in the structure of the economy [5].

Hardy, Wojciech; Keister, Roma; Lewandowski, Piotr distinguish the following types of labor functions: incompatible cognitive analytical, nonstandard cognitive interpersonal, routine manual and routine manual physical [5].

In developed countries, there has been a reduction in the need for low-skilled and medium-skilled labor and an increase in the demand for highly skilled manpower, which is associated with changes in the structure of the economy [5].

Automation and computerization led to a reduction in the number of manual operations and, accordingly, a decrease in the number of employees in accounting, among office clerks and assemblers in the shops. However, in industries with analytical and non-standard interpersonal labor functions (architecture, IT professionals, managers, drivers, waiters, hairdressers), automation had virtually no effect [5].

Also, the percentage of manual operations in agriculture, mining, industry, electricity, gas supply and water supply decreased. However, in general, the share of manual labor in the services sector has increased: transportation, storage and communications, financial sector, real estate, public administration, education and social work.

In Eastern Europe in general, there are typical for Western Europe trends, but with a certain time lag [5].

On the other hand, according to some researchers, not only demand affects the composition of the workforce, but the supply of the able-bodied population to some extent determines the possible ways of economic development. However, studies have shown that somewhere the influence of the level of education on the structure of labor is positive (raising the educational level of the labor resource leads to an increase in highly skilled jobs), and somewhere this influence has not been fixed (the growth of the educational level of labor resources was accompanied by a decrease in the share of highly qualified jobs) [5].

The financial crisis of 2008 adversely affected the labor market in the form of a sharp drop in employment due to a fall in aggregate demand and as a result of a decline in production, but particularly affected first, temporary, low-skilled and young people from the labor force. On the contrary, regular, highly skilled workers of the middle and older age were less affected by the financial crisis. The fact is that regular workers of middle and older age tend to have higher qualifications, which increases their market value in the labor market and simplifies their employment in case of job loss. Due to the fact that migrants are more represented in sectors with temporary low-skilled employment, therefore, employment reduction has affected migrants more than native people. On the contrary, constant employment demonstrated certain inflexibility under changing conditions. The legislation on labor protection played a role here, which complicates the dismissal of permanent workers. However, legislative restrictions in the long term led to the fact that firms began to prefer hiring temporary workers, which in the event of another crisis can easily be dismissed. As a result, in the long term, employment among temporary workers increased and employment among permanent workers decreased. Meanwhile, in countries with a weaker labor safety system, the percentage of permanent workers is higher and vice versa in countries with a well-developed system of labor protection, the firm is inclined to use temporary workers. The fact is that a strong legislative regulation of permanent employment with weak legislative regulation of temporary employment creates a double labor

market, where the cost of temporary workers is significantly lower than the cost of permanent workers. Also, the biggest drop in employment was recorded in the industries with the greatest dependence on external financing, which, more than other industries suffered from tougher credit conditions. On the other hand, firms with less willingness to part with highly skilled workers because of the money spent on their training and more willing to part with low-skilled workers, in which they did not invest. A stronger fall in employment in small firms was registered, which is apparently due to the relatively greater financial stability of large companies [6].

4. Temporary and permanent workers on the example of USA agriculture

According to a survey by the National Agricultural Workers Survey from 1989 to 1998, the migration rate of wage earners in the US remained constant, and then fell by 30% (from 55% in 1998 to 23% in 2009). This trend has two causes: demographic changes in the workforce and structural changes in the labor market. According to experts, the first reason is the change in migration by one third, and the second by two-thirds. The number of farmers in the United States during this period has been steadily declining, which in turn has affected the reduction of the need for temporary agricultural workers. Also in the US agriculture, automation and mechanization were actively introduced, which reduced the need for hired workers. At the same time, the average age of agricultural workers has increased, among them the proportion of women has increased, and the proportion of workers with women and children has increased, which are less likely to labor migration than unmarried men and women. It is also noted that hard physical work in agriculture attracts temporary labor migrants only at the initial stage of their labor activity, and subsequently they leave this field [1-7].

Reducing the number of migrants and temporary workers causes certain difficulties in agriculture, the need for which in the labor force greatly increases depending on the season. In connection with the decrease in the number of temporary workers in US agriculture, an increase in their wages by 19% from 1990 to 2012 was recorded. Also, the US government uses one-time programs to attract a temporary workforce to agriculture in the US [1-7].

5. Technological unemployment

The modern world is characterized by a sharp gap in the level of income between different categories of workers, while scientific and technological progress does not contribute to equalization of incomes. On the contrary, scientific and technological progress over time worsens the employment of the able-bodied population. Bakhshi, Osborne and Fadel studied the impact of scientific and technological progress on the composition of professions. Under the influence of computerization, many professions have disappeared, such as telephone operators, ticket booking, bar code scanning, word processing and spreadsheets. In industry with the introduction of industrial robots, the need for labor has plummeted. To a lesser extent, automation has affected agriculture, but there has also been a reduction in the necessary workforce. As a result, unskilled and semi-skilled workers suffered particularly badly. In the economic literature even a special term "technological unemployment" appeared: a sharp decrease in employment due to scientific and technological progress. For example, in 1980, employment in manufacturing reached 34% in Germany and 22.1% in the US, but in 2011 these figures fell to 20% and 10.2%, respectively. At the same time, the decline in jobs in the government and agriculture in these countries was slower. Computers have proven to be an effective substitute for people in routine, but time-consuming processes of processing large amounts of data. According to some scientists, machines because of their impartiality and neutrality in the future will be able to replace a person in making decisions in the health, judicial system and stock markets. Accelerated

computerization of jobs contributes to a constant drop in the price of computers (an average of 10% each year). Frey and Osbourne, based on a study of the US Bureau of Statistics, concluded that in the coming decades, 47% of jobs in the United States are subject to a high (about 70% probability) risk of automation and computerization with the replacement of people. However, they note that full automation and computerization will most likely not be, and the dynamics of such processes in each specific industry will depend on the specific technological achievements and discoveries in the field of STPs. Some places at risk of computerization can now be protected for people for legal or ethnic reasons and vice versa, industries that are not currently threatened with computerization may be exposed to it in the distant future due to unpredictable scientific and technological discoveries. Work with the need to make complex and non-standard solutions is likely to remain for people. However, for industry, all experts agree that the layer of low-skilled and middle-skilled workers that emerged during the industrial revolution will give way to a few highly skilled specialists in the work with computers and robots. However, scientific and technological progress will generate new specialties, which partially compensate for the reduction in the total number of jobs [7].

6. Conclusion

The conducted studies showed that the need for the number and structure of labor resources varies depending on economic processes. On the other hand, the volume and the structure of labor resources also vary according to their own internal laws.

References

1. Göbel, Christian, Zwick, Thomas (2013). Are personnel measures effective in increasing productivity of old workers? *Labour Economics*. Vol. 22. pp. 80-93
2. Hardy, W., Keister, R., Lewandowski, P. (2018). Educational upgrading, structural change and the task composition of jobs in Europe. Economics of Transition. Vol. 26 (2). pp. 201-231.
3. Maoyong Fan, Susan Gabbard, Anita Alves Pena, Jeffrey M. Perloff (2015). Why Do Fewer Agricultural Workers Migrate Now? American Journal of Agricultural Economics. Vol. 97. Iss. 3. pp. 665–679.
4. Siddharth Sharma, Hernan Winkler. (2018). The labour market effects of financial crises. The role of temporary contracts in Central and Western Europe. Economics of Transition. Vol. 26 (1). pp. 35-60.
5. Vandenberghe, V., Waltenberg, F., Rigo M. (August 2013). Ageing and employability. Evidence from Belgian firm-level data. *Journal of Productivity Analysis*. Vol. 40. Iss. 1. pp. 111–136.
6. Vandenberghe, V. (June 2013). Are firms willing to employ a greying and feminizing workforce? *Labour Economics*. Vol. 22. pp. 30-46.
7. Young Joon Kim, Kyungsoo Kim, Su Kyoung Lee (2017). The rise of technological unemployment and its implications on the future macroeconomic landscape. *Futures*. Vol. 87. pp. 1-9.