

**ICEST 2021****II International Conference on Economic and Social Trends for Sustainability of Modern Society****LABOR MARKET IN PANDEMIC: CHALLENGES TO  
SUSTAINABLE DEVELOPMENT**

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**Abstract**

The article discusses the current state of the labor market of Russia, which allows you to identify the dynamics of unemployment. It is emphasized that the level of economy emergency is different in different regions of the country, which is determined by the stability and balance of regional economic systems, the ability to respond to external shocks, therefore the degree of negative impact on the labour market in different regions also fluctuates depending on the built-in adaptability, the effectiveness of economic policy. The ratio of the industrial production index and the growth rate of unemployment during the pandemic period and the pace of unemployment changes in the regions are analysed. A regression model is presented, and it has been shown that the variation of the number of unemployed by more than 70% is determined by the influence of the level of GDP and salary. Anti-crisis measures to support employment and income contributed to the support of demand, GDP. The article emphasizes that the regulatory measures in the long term should be focused on adapting the structure and subjects of the labor market to post pandemic conditions, digitalization formats. At the same time, emphasis is necessary for employment programs, their promotion, new partnership mechanisms and improving approaches to the effectiveness of anti-crisis measures in the labour market.

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## **1. Introduction**

One of the basic principles of the sustainable development concept is the achievement of a balance between the needs of the population of the globe and ways to satisfy them. The size and growth rate of the population should correspond with the changing productive potential of the global ecosystem. The obstacle in achieving welfare is the poverty and limiting the possibilities of the working-age population in the application of its labour, so the solution to the problem of sustainable development is in the plane of the labour market and the measures of its anti-crisis regulation. The coronavirus pandemic turned into a serious damage for human capital, associated not only with a high level of morbidity, a deficit in satisfying the vital needs of people who had a consequence of previous "optimization" of health, but also a deterioration in the quality of life in connection with the total fall in income, the strengthening of social differentiation and increasing unemployment. The negative consequences of the dissemination of COVID-19 are manifested against the background of global trends in the deterioration of employment and driving conditions marked in the ILO report for 2020: a decrease in the level of projected development and inclusiveness complicates the fight against poverty and working conditions in low-income countries; the share of the defective use of workers' labour is growing, significantly exceeding the unemployment rate and being an indicator of the discontinuity in access to employment; the number of jobs with "decent" working conditions is reduced; inequality in access to work, especially worthy work increases; growing inequality in income, according to the ILO (2020), exceeds all expectations.

## **2. Problem Statement**

The level of sedimentation of the economy is different in different regions, which is determined by the stability and balance of regional economic systems, the ability to respond to external shocks, therefore the degree of negative impact on the labour market in different regions also fluctuates depending on the built-in adaptability, the effectiveness of the economic policy. In general, the anti-crisis measures to stimulate the effective demand - social protection and support of employment of the population, of course, have a positive effect on the labour market, smoothing the consequences of temporary unemployment and reducing income in connection with the epidemic. It seems relevant study of the theoretical and methodological basis and the development of recommendations in the field of anti-crisis regulation of the labour market, taking into account the global challenge, initiated by the coronavirus pandemic, and the local specifics of the epidemic development at the present stage.

## **3. Research Questions**

The conceptual foundations of the labour market functioning in the conditions of stability disorders are presented in the works of both domestic and foreign authors, starting with Keynes (2002), who has substantiated the need for state intervention in the economy.

The problems of the sustainable development of the labour market are covered in the works of many Russian authors. Currently, the vector of scientific research in this area is associated with an increase in the effectiveness of the activities carried out, the optimization of the set and structure of the methods used,

depending on the initial characteristics of the labour market and budget constraints, accounting for external influence parameters.

In the works of Brynjolfsson et al. (2020) and Cajner et al. (2020), as the main determinants of the instability of the labour market, the pandemic COVID-19 is considered; an analysis of the market situation is carried out. The data presented in the article allows you to determine the timing, means, methods for equilibrium recovery.

In the conditions of imbalance of development under the influence of a pandemic factor, a social component is coming out - the solution of social problems, acted with the crisis, and above all the problems of unemployment, programs to facilitate enterprises in preserving existing and creating new jobs are needed (Cajner et al., 2020).

Stability recovery activities are considered in the literature in three directions:

1) general and specific in the manifestations of the crisis, the severity of the consequences (Bushuev, 2020; Chevtaikina & Ermolina, 2020; Osokina, 2020).

2) quantitative and qualitative changes in the labour market under the influence of the crisis, estimated by the main indicators of its functioning (unemployment, wages, labour migration) (Gimpel'son & Kapelyushnikov, 2015; Kapelyushnikov & Oshchepkov, 2014; Simonova et al., 2019). Researchers Gimpel'son and Kapelyushnikov (2015), as the specifics of the domestic labour market model, note its "shockedness" - a weak reaction to the fluctuations in the economic situation.

3) public regulation (management) of the labour market, taking into account modern trends, for example, flexibilization (Evseenko & Medvedeva, 2020; Panov, 2015; Yanchenko, 2014). Evseenko and Medvedeva (2020) in their publication compare regulatory measures in various countries, among which are a surcharge of unemployment, an increase in unemployment benefits, expanding access to benefits for self-employed.

Summarizing the experience of regulation in crisis periods 2008-2010, 2014-2015 Panov (2015) notes the regional heterogeneity of the costs, reducing the return on the implementation of measures, a decrease in the diversity and universalization of measures, the hopping change in the ranking positions of the territories according to the degree of reaction of local labour markets for impact measures.

As the main anti-crisis activities, most of the labour market researchers call the traditional set of measures - provided by the public employment service during the dismissal, advice on employment and self-employment, professional retraining, assistance to enhance mobility, payments for unemployment benefits, etc. (Lisovik & Volostnykh, 2012).

Thus, the following questions are set in this study:

- What are the changes in the structure of demand and supply in the labor market, provoked by a pandemic?
- What is the reaction of regional labour markets on the tendency of the fall of economic activity in connection with the pandemic and the action of restrictive measures?
- How can we quantify the relationship and mutual influence of GDP and the state of the labour market?

- What measures of anti-crisis regulation during the pandemic period contribute to increasing the sustainability of the labour market conjuncture?

#### 4. Purpose of the Study

Despite the wide scientific and methodological base of the study disclosed in the works of both domestic and foreign authors, the issues of the definition of modern global and local challenges of the labour market, its stability and balance of development, as well as the prospects for increasing the sustainability of functioning due to the pandemic crisis and risk enhancement of the release of employees are updated and require more detailed study during the pandemic period.

The purpose of the research is the substantiation of the pandemic factor as determinant of the instability of the labour market in modern conditions, the analysis of its influence and determination of anti-crisis regulation measures.

The coronavirus pandemic, which determined non-standard shocks for the labour markets of countries and regions, actualized studies of the state of labour markets, estimation of the severity of the consequences and adoption of stabilization measures (Drobot, 2020; Leybovich, 2020; Vertakova & Plotnikov, 2020). Among foreign studies, the influence of a pandemic on the economy as a whole, and the labour market, in particular, as well as the need for new regulatory measures is considered in the works (Coibion et al., 2020; Furceri et al., 2020; Jordà et al., 2020).

A number of ILO reports are published, containing a description of the labour market problems in the conditions of a pandemic and the principles of their solution (Good Jobs for All in a Changing World of Work, 2020; ILO, 2020; ILO Bulletin, 2020). The ILO reports are argued by the need for large-scale state support measures of enterprises aimed at preserving employment and income, stimulating economic development, job creation, search for solutions through dialogue between governments, employees and entrepreneurs. In these provisions, we will base our own conclusions, expanding and deepening them. However, publications justifying a set of stabilization measures depending on the specifics of the labour markets of countries and regions are not currently enough, which determines the subject of the study of the article.

#### 5. Research Methods

When analysing the data, the main economic and statistical methods were used: an index method (calculation of the unemployment rate index), the comparison method, grouping and ranking results (when evaluating the employment response for a decline caused by a pandemic, at the regional level), a correlation-regression method (when establishing relations of unemployment, fall of GDP, income, wages).

Multiple regression model:

$$y = a + b_1x_1 + b_2x_2, \quad (1)$$

where y is the number of unemployed, x<sub>1</sub> – x<sub>2</sub> – factors of influence: x<sub>1</sub> - GDP, billion rubles, x<sub>2</sub> – wages, rub., a, b<sub>1</sub>, b<sub>2</sub> – communication coefficients.

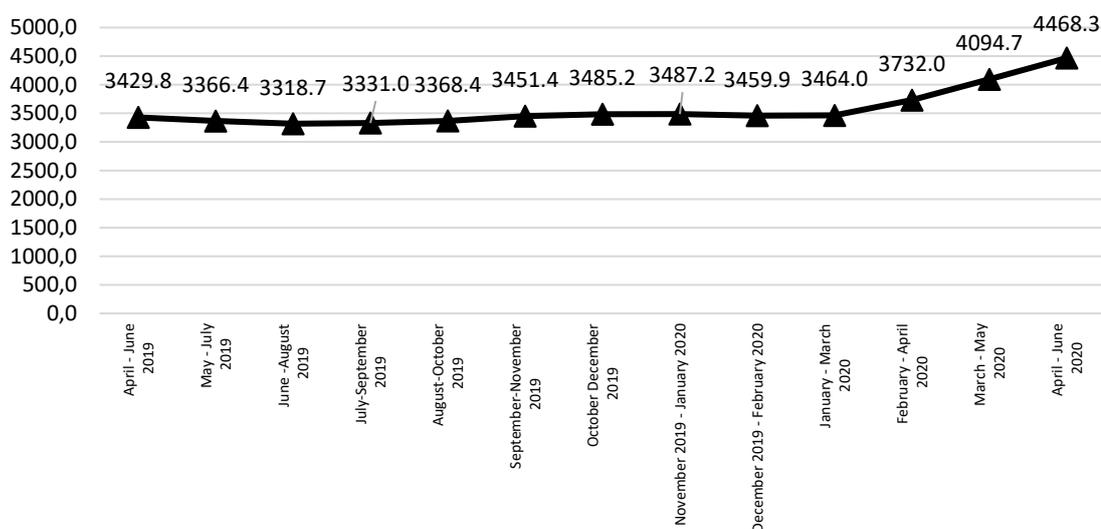
## 6. Findings

Those who are most susceptible to the pandemic crisis and suffered as a result of falling demand for products and services as a result of movement restrictions, have the highest loss of jobs and reduce working hours (public catering, travel business and hotel service, retail trade, manufacturing and passenger manufacturing transport, etc.). In the world, according to the ILO (2020) estimates, in those collided with the decline in the production of sectors, where the risk of growth in the number of layoffs, there are employed 1.25 billion workers, which is almost 38% of the world labour force.

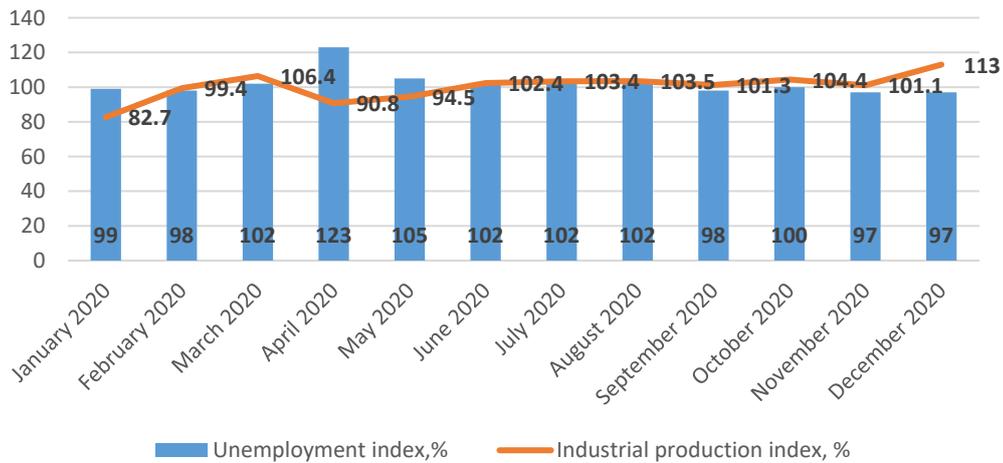
The growth rate of unemployment both in our country and all over the world in 2020 is determined by the dynamics of the distribution and control of COVID-19, with the effectiveness of stabilization measures. The number of unemployed is an essential indicator reflecting the state of the labour market (Figure 1). As the crisis phenomena and the actions of restrictive measures are developing, the number of unemployed is growing: from January to June 2020, the increase was 28%.

Asymmetry of regional labour markets (Simonova et al., 2019) especially aggravated during the pandemic period. So, in July-September 2020 compared with the pre-crisis period October-December 2019 the rate of unemployment growth in some regions was substantially higher than the growth rate of this index in Russia in general. For example, in St. Petersburg, the unemployment rate for the last period increased by 253%, Moscow -220%, Tomsk region -204% (in the Russian Federation as a whole - by 139.13%). However, in some regions, the unemployment rate even fell during a pandemic (Primorsky Krai, the Republic of Sakha (Yakutia), Khabarovsk, Chukotka Autonomous District, Oryol Region, the Kamchatka Territory, the Jewish Autonomous Region). The structure of the economy and the effectiveness of anti-crisis measures is of great importance.

A comparison of the industrial production index and the rate of increase in unemployment reflects a gradual increase of the crisis in the industry reached a peak in March 2020, as well as a parallel deterioration in the labour market (Figure 2).



**Figure 1.** Dynamics of the number of unemployed (on average for three months, April 2019 - June 2020 according to Rosstat



**Figure 2.** Correlation of the industrial production index and unemployment growth rates (January - December 2020)

In accordance with the model we propose, we will conduct a regression analysis. The initial data are presented in Table 1.

**Table 1.** Initial data for regression analysis according to Rosstat

	Unemployed, Y, million people	GDP, X1, RUB bln	Wage, x2, rub.
Q2 2019	3429.8	26 410.20	48453
Q3 2019	3331	28 875.40	45726
Q4 2019	3485.2	29 815.60	51684
Q1 2020	3464	25 317.70	48390
Q2 2020	4468.3	23 288.20	50784
Q3 2020	4771.9	27 941.3	49021
Q4 2020	4581.0	26879.53*	49406.5*

\* calculated based on forecast data

The regression model equation is as follows:

$$Y = 833.0349 - 0.07443X_1 + 0.104X_2 \quad (2)$$

The average error of the approximation of the selected model is 11.6%, which indicates a good selection of the model to the initial data.

According to the analysis of the model, it is advisable to note that a weak dependence of the selected factors and the final result is detected, as indicated by the found multiple correlation coefficient  $R = 0.43$ . The revealed link shows that the variation of the number of unemployed by 18.7% depends on the factors recorded in the model: the level of GDP and wages. Verification of the model on multicollinearity did not show the presence of this phenomenon in factors.

Checking the hypothesis about the overall significance of the regression equation using Fisher's distribution statistics showed that  $F = 0.46$ . Thus, the determination coefficient is statistically not

significant and the joint insignificance of coefficients at factors  $x_i$  is confirmed. The assessment of the private criteria of Fisher showed the mutual inappropriateness of the inclusion of each of the factors in the model alternately. Checking the presence of heteroscedasticity using the correlation test of the alcoholic, as well as using the Goldfeld-Kvandt test, showed the absence of heteroscedasticity in the model. Evaluation of the criterion of Darbin-Watson showed the presence of autocorrelation of residues in the model.

At the maximum coefficient  $\beta_2=0.311$  we conclude that the greatest effect on the result  $Y$  has a factor  $X_2$ . It has been established that in the study situation, 18.76% of the total variability  $Y$  is explained by the change in the factors of  $X_j$ . Thus, despite the data obtained as a result of modelling, we note that, in general, there is a relationship between the unemployment rate, the level of GDP and salary.

Coronavirus Pandemic exacerbated many problems of labour market and accelerated the process of digitalization of employment in the regions, search for new forms of labour organization. According to the Ministry of Labor of the Russian Federation in November 2020, 3.5 million people work in a remote format, while in 2019 there were 30 thousand such citizens, and in the most acute period of the coronavirus pandemic, up to 5.5 million people worked remotely. At the same time, there is differentiation of regions in the possibilities and efficiency of remote operation. From January 1, 2021, a law on remote work in the Russian Federation, which suggests different formats of remote work comes into force.

## 7. Conclusion

In order to sustain the development of the labour market - reducing the negative impact of the pandemic - stabilization measures were taken in the following main areas: support for enterprises, employment and income; stimulating the economy and creating jobs; protection of workers in workplaces. Anti-crisis support measures for income and employment included interest-free loan payments, financial assistance to business, an increase in the maximum amount of unemployment benefit, an increase in the minimum amount of payments for hospital, additional benefits of families in which parents are unemployed; additional benefits of families with children, participation in temporary employment programs, promoting self-employment, distance learning, advanced vocational training, etc. The total amount of anti-crisis budget support amounted to 4.5 percent of GDP. Anti-crisis measures aimed at supporting income and employment contributed to the support of solvent demand and GDP.

The growth rate of unemployment in 2020 is in the correlation dependence on the dynamics of the distribution and control of COVID-19, the effectiveness of stabilization activities. We analysed the ratio of the industrial production index and the rate of unemployment rates during the pandemic period, the rate of change of unemployment in the regions. The results of the calculations on the regression model show that the variation of the number of unemployed by 72.6% depends on the level of GDP and wages.

Under the exit to the trajectory of sustainable development, the problem of structural policies and the restructuring of demand for labour becomes a paramount task. Taking into account the long-term trends of digitalization, support measures should be focused on adapting structures and subjects of labour market to post pandemic conditions - the transformation of the labour market institutions, the structure of demand for labour towards expanding the share of digital economy, digital competencies program, creating incentives to improve mobility. Focus on relevant selective programs in regions, new mechanisms for their

promotion and monitoring, development of partnerships of labour market subjects, improving the methodology and statistical framework for assessing the effectiveness of anti-crisis measures in the labour market in the short and long term, taking into account the scenarios of the duration of the pandemic is needed.

## References

- Brynjolfsson, E., Horton, J. J., Ozimek, A., Rock, D., Sharma, G., & TuYe, H. Y. (2020). *COVID-19 and remote work: an early look at US data* (No. w27344). National Bureau of Economic Research.
- Bushuev, V. V. (2020). Accident or Unknown pattern? *Energy Policy*, 4 (146), 20-29.
- Cajner, T., Crane, L. D., Decker, R. A., Hamins-Puertolas, A., & Kurz, C. (2020). Tracking Labor Market developments during the COVID-19 Pandemic: A Preliminary Assessment. Federal Reserve Board. <https://doi.org/10.17016/FEDS.2020.030>
- Chevtaikina, P. Yu. & Ermolina, L. V. (2020). Pandemic effect: why the decline in the global economy due to coronavirus may be worse than the crisis of 2008. *The Economy, Management and Law in Modern Conditions: the Interuniversity Collection of Articles*, 153-158.
- Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). *Labor markets during the COVID-19 crisis: A preliminary view* (No. w27017). National Bureau of Economic Research.
- Drobot, E. V. (2020). Vliyanie pandemii COVID-19 na rynek truda SShA [The impact of the pandemic COVID-19 on the US labour market]. *Russian Journal of Labor Economics*, 7, 577-588.
- Evseenko, E. A., & Medvedeva, M. M. (2020). A comparative analysis of anti-crisis measures taken by the countries of the world to combat the crisis caused by the COVID-19 pandemic. *Proceedings of the XII International. Science and Practice Conference on Current Issues of Tax Policy*, 87-92.
- Furceri, D., Loungani, P., Ostry, J. D., & Pizzuto, P. (2020). COVID-19 will raise inequality if past pandemics are a guide. *VoxEU column*.
- Gimpel'son, V. E., & Kapelyushnikov, R. I. (2015). Russia's model of the labor market: A test of the crisis. *Journal of the New Economic Association*, 2, 249-254.
- Good Jobs for All in a Changing World of Work. (2020). [https://www.oecd.org/employment/emp/long%20booklet\\_EN.pdf](https://www.oecd.org/employment/emp/long%20booklet_EN.pdf)
- ILO. (2020). *World Employment and Social Outlook: Trends 2020*. International Labour Office – Geneva ILO. [https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms\\_734455.pdf](https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_734455.pdf)
- ILO Bulletin. (2020). *Issue 2: COVID-19 and the scope of labor. Updated estimates and analysis*. [https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-moscow/documents/briefingnote/wcms\\_742254.pdf](https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---sro-moscow/documents/briefingnote/wcms_742254.pdf)
- Jordà, Ò., Singh, S. R., & Taylor, A. M. (2020). Longer-run economic consequences of pandemics?. *The Review of Economics and Statistics*, 1-29.
- Kapelyushnikov, R. I., & Oshchepkov, A. Yu. (2014). Russian labor market: Paradoxes of post-crisis development. *Voprosy Ekonomiki*, 7, 66-92.
- Keynes, J. M. (2002). Obshchaya teoriya zanyatosti, protsenta i deneg [General theory of employment, percentage and money]. *Moscow: Helios ARV. [In Russian]*.
- Leybovich, A. N. (2020). COVID-19 and the labor market: old approaches do not work. *Standards and Quality*, 5, 68-70.
- Lisovik, B. S., & Volostnykh, V. V. (2012). Theoretical foundations of the release of employees and the experience of anti-crisis regulation of local labor and employment of the population of monocity. *Modern Problems of Science and Education*. <http://www.science-education.ru/ru/article/view?id=6044>
- Osokina, N. V. (2020). Crisis 2020: Analysis from the position of the peace approach and conclusions for Russia. *Financial Economy*, 4, 292–297.
- Panov, A. M. (2015). Effectiveness of Labor Market Regulation in the Region (Case Study of Crisis Response Measures). *Economic and Social Changes: Facts, Trends, Forecast*, (6), 91-107.

- Simonova, M., Mirzabalaeva, F., & Sankova, L. (2019). Differentiation of regional labor markets: New risks and opportunities for smoothing. In *Sustainable Growth and Development of Economic Systems* (pp. 259-274). Springer, Cham.
- Vertakova, Yu. V., & Plotnikov, V. A. (2020). The development of the trends of the global crisis under the influence of the COVID-19 pandemic. *The Coronacrisis Economy: Challenges and Decisions*, ed. R.M. Nizhegorodtsev. Voskhod-A.
- Yanchenko, E. V. (2014). Labor management based on the concept of decent work. *Proceedings of the VI International Science and Practice Conference on Decent labour - the Basis of a Stable Society*, 231-235.