

# Integral Estimation of the Tention on the Regional Labor Market<sup>1</sup>

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One of the consequences of the global economic crisis was the increase of the tightness on the labor market. It could be noticed through the growth of registered, and general unemployment; gain of long-term, chronic, and hidden unemployment; understated levels of wages; the expansion of unpaid employment; lack of vacancies; and the expansion of latent relations in the field of employment; gain of gender, age, and territorial disproportions on the labor market, so as the dissemination of the strike movements.

Analysis of individual factors, its differentiation and classification of the regions on this base, gave contradictory results, and showed the discrepant nature of the subject. Very often, based on which factor was selected for the estimation of the tightness, the same region was falling into different, sometimes conflicting, groups of the tightness on the regional labor market. That complicated the performance of the effective managerial decisions, and requested a new methodic, based on the integral estimations. In order to build such an estimations it was necessary to:

- 1) form the system of variables, which would sufficiently reflect the characteristics of the tightness on the regional labor market;
- 2) bring different factors to the comparable base;
- 3) select the method of integration of the chosen factors into one aggregated indicator.

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While solving this task, we were considering the approaches of Russian and foreign scientists in building the index of human development, integral indicators of life quality, so as the method of planning and forecasting of the scientific researches – PATTRN [1-3].

The system of basic factors had to be complex, logically complete, data-intensive, and reflect the most important characteristics of the tightness on the labor market. Initially, as the result of the analysis of the state and department statistics in the field of employment and labor market, and the expert survey, the eleven factors were chosen:

- $x_1$  – level of the official unemployment, %;
- $x_2$  – level of the general unemployment, %;
- $x_3$  – amount of unemployed population per one vacancy, persons per vacancy;
- $x_4$  – fraction of youth in general unemployment, %;
- $x_5$  – fraction of women in general unemployment, %;
- $x_6$  – fraction of the unemployed, who are searching for a job longer than one year, %;
- $x_7$  – past due wages, in rubles per one employee;
- $x_8$  – hours that are not worked, as the result of part time employment or furlough by employer's initiative, hours per one employee;
- $x_9$  – average monthly wage per employee, in rubles;
- $x_{10}$  – fraction of employees involved in strikes, %;
- $x_{11}$  – fraction of people, who were desperate to find a job, among economically active and able-bodied population, %.

The first three indicators reflect the disproportions of labor force supply and demand, the next two show age and gender asymmetry on the labor market.  $x_6$  stands for long term unemployment,  $x_7$  and  $x_8$  – hidden unemployment,  $x_9$  reflects the price of the labor force, an underestimated level of which, causes a decrease in general and hidden unemployment,  $x_{10}$  shows the degree of open display of low satisfaction from the employees with their situation on the labor market, and  $x_{11}$  explains those, who want to work, ready to start work, but stopped active job search, due to being unable to find a matching vacancy.

Different factors were brought to the comparable base with the help of the following formula:

$$y_i^{rt} = (x_i^{rt} - x_{mini}^t) / (x_{maxi}^t - x_{mini}^t) \quad (1)$$

– when there was a positive connection of the factor with the tightness on the labor market;

$$y_i^{rt} = (x_{maxi}^t - x_i^{rt}) / (x_{maxi}^t - x_{mini}^t) \quad (2)$$

– when there was a negative connection, where  $y_i^{rt}$  and  $x_i^{rt}$  – unified and original meaning of the factor  $i$  ( $i = 1 \dots n$ ,  $n$  – number of the selected factors) in region  $r$ , year  $t$ ;

$x_{maxi}^t$  and  $x_{mini}^t$  – maximal and minimal meaning of the factor  $i$  across all the regions in year  $t$ .

Integral indicator of the tightness on the labor market (let us call it “Tightness Index”) was calculated according to the formula:

$$J_H^{rt} = a_1^t \cdot y_1^{rt} + a_2^t \cdot y_2^{rt} + a_3^t \cdot y_3^{rt} + \dots + a_n^t \cdot y_n^{rt}, \quad (3)$$

where  $J_H^{rt}$  – Tightness Index on the labor market in region  $r$  year  $t$ ;

$a_i^t$  – coefficient of the relevant importance of the tightness factor  $i$  (is defined on the expert evaluations),

$$a_1^t + a_2^t + a_3^t + \dots + a_n^t = 1. \quad (4)$$

It would be rational, to add to the statistical estimation of the tightness on the regional labor market an individual estimations from labor market agents and experts.

Main information sources were: state data, data from federal and regional employment offices, and the data, which was obtained in the result of social surveys from population and experts.

The suggested methodic allows efficiently indicate, and react on the negative events on the labor market. It is quite universal, and with a slight modifications, could be used on international, national, and regional levels. Besides, this methodic is clear, relatively simple, and is based on applying Excel standard functions.

The described technique was tested on the example of a local labor markets of the rural regions of Altai Krai. During the first stage the system of private indicators of intensity on a labor market was created. It included eight indicators. The following indicators were excluded from the initial list: level of general unemployment, a share of despaired to find work among economically inactive population in able-bodied age, and a share of the workers participating in strikes. Since the first two indicators were not recorded at the area level, and the strikes in overwhelming majority of the rural regions of Altai Krai were absent.

Then the coefficients of the relative importance of the private signs of intensity were defined. For this purpose it was offered to experts to evaluate the selected indicators on importance degree, having

appropriated the maximum rank to the most important of them, and minimum – to the least important. The next step was in calculating an average rank for each private indicator of intensity on a labor market. Then average ranks were summarized, and the weight of each of them in total amount was defined.

At the second stage the selected private indicators were brought to a comparable look on each rural area according to a formula (1) or (2).

At the calculation of the unified indicator – load of the unoccupied population per one vacancy – for the areas in which, a workforce centers were not declared to any vacancy, the assumption that in such areas was available at least on one free workplace was accepted. In this case the value of a considered indicator equaled number of citizens, unoccupied and registered in the workforce centers of the respective areas. Such methodical approach allows as to compare separate areas among themselves on the private sign called above, and rather precisely to estimate a contribution of the last to an integrated indicator.

At the third stage the way of aggregation of the unified private indicators in the uniform generalizing indicator – an intensity index ( $J_H^r$ ) was defined.

$$J_H^r = 0.182 \cdot y_1^r + 0.179 \cdot y_2^r + 0.148 \cdot y_3^r + 0.131 \cdot y_4^r + \\ + 0.125 \cdot y_5^r + 0.112 \cdot y_6^r + 0.076 \cdot y_7^r + 0.047 \cdot y_8^r, \quad (5)$$

where,  $r$  – an area index ( $r = 1 - 60$ );  $y_i^r$  the unified private indicator of intensity of  $i$  in  $r$  region ( $y_1^r$  – level of officially registered unemployment;  $y_2^r$  – amount of unemployed population per one vacancy, persons per vacancy;  $y_3^r$  – average monthly wage per employee;  $y_4^r$  – specific weight of the unemployed who are looking for work more than a year;  $y_5^r$  – past due wages per one employee;  $y_6^r$  – share of youth in a total number of the unemployed;  $y_7^r$  – hours that are not worked, as the result of part time employment or furlough by employer's initiative;  $y_8^r$  – share of women in a total number of the unemployed);  $y_i^r$  – factors of the relative importance of private indicators of the intensity on a labor market.

Discussion of results of approbation with experts allows to draw a conclusion that the developed technique gives the chance to estimate rather adequately a situation on local labor markets of Altai Krai. Selective polls of the population on problems on the rural labor market, carried out in separate areas of the region, also confirm this conclusion.

## References

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