

WAYS OF REGULATIONS OF SEGMENTATION PROCESSES ON THE REGIONAL LABOUR MARKET OF AGRICULTURAL SECTOR

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High level of competitiveness of the national economy, that requires the fullest use of all resources, including human one that needs special significance, is an important condition for progressive development of modern Ukraine as a European country. Therefore, a strategic task of the Ukrainian economy is to improve the efficiency of human resources. The human, his ability to highly creative work remains in the future as one of the main factors of the economic growth. A specific indicator of the role of the human factor is labour market that occupies a central place in the system of market relations.

Supply of the economy with highly skilled workers, professional qualification imbalance, discrepancy of trends and training needs of the labour market, poor quality of available jobs, significant difference of employment in the industrialized developed and mono structural regions, youth unemployment, migration outflow of labour to labour markets in other regions, shadow employment and illegal migration remain critical problems on the regional level [1,4].

The characteristic feature of the labour market formation in agriculture is high labour-redundant situation that causes seasonality of agricultural production, changes in the size and specialization of businesses, low-territorial and professional mobility of country people, lower prestige of agricultural labour and its low pay, deteriorating of socio-economic working conditions. Therefore, the formation of the civilized labour market in agriculture requires careful monitoring and control of the processes occurring in it, and its management is an important area of public activity in the transformed economy. [3]

The following leading Ukrainian scientists O.Yu. Amosov, O.N. Borodina, O.A. Grishnova, S.O. Gudzynskyi, V.S. Diesperov, V.K. Zbarskyi, O.I. Zdorovtsov, G.I. Kupalova, I.I. Lototskyi, S.D. Luchyk, M.J. Malik, V.I. Matsyhora, L.I. Myhaylova, L.Ya. Novakovskiy, O.V. Pavlovska, J.S. Paskhaver, I.L. Petrova, I.V. Prokopa, V.K. Tereschenko, L.P. Chervinska, O.V. Chernyavska, M.V. Shalenko, L.S. Shevchenko, V.V. Yurchyshyn, K.I. Yakuba and others investigated the problem of management and regulation of the labour market and industrial labour relations in general in the agricultural sector.

Among foreign scientists who contributed to the study of the above mentioned problem, the most significant were G. Becker, K. Brunner, J.-R. Budvel, N.T. Vyshnevskaya, I.A. Denisova, J. Gibbs, R.I. Kapelyushnikov, R.P. Kolosova, V. Kristaller, I.O. Maltseva, I.S. Maslova, A. Marshall, V.V. Radaiev, D. Ricardo, S.Yu. Roshyn, Adam Smith, V.V. Tomilov, R.F. Turovskiy, L. Turow, I. Fisher, J. Friedman, O.I. Shkaratan, T. Schultz and others. However, many issues related to the improvement of the management and regulation of the labour market in agriculture remain unsolved today.

Methodology of the research. The purpose of this article is to study the ways of regulation of segmentation processes on the labour market of the agricultural sector in selected economic regions based on using economic-mathematical models for assessing the needs of a separate economic region in the labour force. While working on the article the general scientific and analytical-predictive methods were used. The method of factor analysis was used particular in the study of peculiarities of regional labour markets management. The structure of socio-economic relations on the labour market and the dynamics of its elements were studied by means of the method of statistical analysis. The method of simulation was used in developing the algorithm of possible effects of deepening the segmentation of the labour market in agriculture and to regulate the mechanism to overcome the negative effects.

Results of the research. Structural organization, operation and government mechanism of the management at the labour market in agriculture cannot be practiced without the objective processes of its differentiation, division into groups, segments that take place in the conditions of market transformation.

We showed approaches to the regulation of process of labour market segmentation by age criterion, based on the using of developed economic-mathematical models for assessing the needs of carrying a separate economic region in the labour force for agriculture. The developed model depends on demographic factors and socio-economic issues that affect the amount of labour of the agricultural sector. The correlation between the number of working professionals of agricultural sector and the need for them is suggested to regulate by the following parameters: average work load of workers, demand for them, the allowable limit of age in agriculture; plans of students acceptance to higher educational establishments that train specialists for the agricultural sector [2,5] .

A set of functions Y , which expresses the distribution of number of employees in the agricultural sector of specific economic region with considering of age segmentation (by age groups) is used within the proposed balance of the model:

$$Y = \{y_i(t)\}_{i=0}^m, \quad (1)$$

where i – is a conventional age of employees of the agriculture sector.

Then $y(t)$ expresses the total number of the agricultural sector:

$$y(t) = \sum_{k=1}^m y_k(t). \quad (2)$$

To show within the balance model the outflow of workers from the agricultural sector, a set of functions Q is used:

$$Q = \{q_i(t)\}_{i=0}^m, \quad 0 < q_i(t) < 1, \quad (3)$$

elements of which will reflect the average share of agricultural sector workers who are released annually considering age segmentation.

To show within the balance model the flow of workers in the agriculture sector considering age segmentation a set of functions F is used:

$$F = \{f_i(t)\}_{i=0}^m, \quad (4)$$

To construct the balance system of equations in the research it was assumed that the value set of functions $Y: \{y_i(t-1)\}_{i=0}^m$, at the moment of time $t-1$ is known, then the number of workers in the agricultural sector considering age segmentation at the moment of time t will be calculated by the formulas:

$$\begin{cases} y_0(t) = f_0(t) \\ y_1(t) = [(1 - q_0(t-1))y_0(t-1)] + f_0(t) \\ \dots \\ y_m(t) = [(1 - q_{m-1}(t-1))y_{m-1}(t-1)] + f_m(t) \end{cases} \quad (5)$$

The research of the analytical form of the functions from the set (4), which allowed introducing several additional relations, was conducted in the thesis to use the system of equations (5).

For evaluation the needs of the particular economic region in the number of employees in the agricultural sector for the time t the function $S(t)$ was used, the range of values of which is presented as:

$$S(t) \geq 1, \forall t > t_0. \quad (6)$$

The value of the function $S(t)$ depends on the following factors:

- planned activities in the development of the agricultural sector in a particular economic area;
- labour demand for the agricultural sector in a particular economic area.

To show the average work load of workers of the agricultural sector $u(t)$ was introduced, which function range of values describes intervals:

$$u(t) \in (u_1, u_2), \quad (7)$$

where parameters $u_1 > 0$, $u_2 > 1$ set the lower and upper limit for the average work load of employees of the agricultural sector, for example, 1 - 1.5 of the rate.

To define the indicator $D(t)$, which describes the difference between the need for workers in the agricultural sector and the actual number at the moment of time t , we use the function:

$$D(t) = \frac{S(t)}{u(t)} - \text{rest}^0(t), \quad (8)$$

where $\text{rest}^0(t)$ function shows the total number of employees in the agricultural sector of the specific economic region at the moment of time t . Obviously, in case $D(t) < 0$ such situation arises, where there are enough employees in the agricultural sector within a particular economic area, and there is no need to teach new ones and not hire those arriving from other economic regions. If $D(t) > 0$, the workload of staff must be increased or vacant seats must be filled.

To show in the model the number of vacant seats within a particular economic area for the moment of time t function $V(t)$ is defined as:

$$V(t) = \begin{cases} 0, & S(t) < u_1 \text{rest}^0(t), \\ \min(x), & S(t) > u_1 \text{rest}^0(t) \end{cases} \quad (9)$$

Then on the basis of equations (6) - (9) the average workload of employees in the agricultural sector within a particular economic area $u(t)$ is presented as the relation:

$$u(t) = \begin{cases} u_1, & S(t) < u_1 \text{rest}^0(t), \\ \frac{S(t)}{(\text{rest}^0(t) + V(t))}, & S(t) > u_1 \text{rest}^0(t). \end{cases} \quad (10)$$

We can determine through A the set of functions $A_i(t)$, which describes the number of employees in the agricultural sector considering the age segmentation applying for employment at the moment of time t within a particular economic area. Then the total number of workers employed at the moment of time t , is defined as:

$$A(t) = \min\left(\sum_{i=1}^m A_i(t), V(t)\right) \quad (11)$$

Based on the relations (6) - (11), a set of functions F is presented in the form:

$$\begin{aligned} f_{i_0}(t) &= \min\{A_{i_0}(t), \max\{0, A(t)\}\} \\ f_{i_1}(t) &= \min\{A_{i_1}(t), \max\{0, A(t) - f_{i_0}(t)\}\} \\ &\dots \\ f_{i_k}(t) &= \min\left(A_{i_k}(t), \max\left(0, A(t) - \sum_{n=0}^{k-1} f_{i_n}(t)\right)\right). \end{aligned} \quad (12)$$

Suggested above correlations (1) - (5), (12) allow:

- to explore the dynamics of workers in the agricultural sector in a separate economic region taking into consideration age segmentation within a specified period of time $t_0 < t < T$, that will enable to determine economic areas with excess of labour force or with lack of labour force and to regulate inter-regional migration;
- to approve the licensed acceptance of students to specialized higher educational establishments of the separate economic region and perform calculations in funding these schools on base of the existing standards in their training, which will regulate the educational qualification imbalance at regional labour markets;
- to optimize updating and rejuvenating of the employees staff in the agricultural sector, improve vocational qualification of workers, supply the agriculture sector with skilled workforce that will contribute to saturation of the labour market of the agricultural sector with young professionals and reduce the outflow of Ukrainian youth abroad;
- to use the labour potential of the national economy in a rational way, which will release the Ukrainian labour market at a European level.

Conclusions. At present, the main problems of regional labour markets are to provide the economy with highly skilled workers, professional qualification imbalance, discrepancy of directions and training needs of the labour market, poor quality of available jobs, significant difference of employment in the industrialized developed and mono-structural regions, youth unemployment, migration outflow of

labour force to labour markets in other regions, the shadow employment and illegal migration.

The current labour market in agriculture is characterized with high labour excess situation, caused by seasonality of agricultural production, resizing and specialization of businesses, low-territorial and professional mobility of country people, lower prestige of agricultural labour and its low pay, deterioration of socio-economic conditions .

Applied economic-mathematical models for assessing the needs of a separate economic region in the labour force for the agricultural sector will make it possible to investigate the dynamics of workers in the agricultural sector at the level of a separate economic region, approve licensed students acceptance to specialized universities of the separate economic region and perform the calculation of the financing of these schools on the base of existing regulations of their training, update and optimize the rejuvenation of employees in the agricultural sector, improve vocational qualification of workers, supply the agriculture sector with skilled workforce, use labour potential of the national economy efficiently.

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