INNOVATIVE MODEL OF ENTERPRISES PERSONNEL INCENTIVES EVALUATION

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ABSTRACT

The aim of the article is to study the analysis of personnel at enterprises of the agro industrial complex by applying an integral indicator.

To create a system of incentives for enterprise personnel, the work justifies the use of a generalized indicator of personnel incentives evaluation, which is a set of group integral indicators of the appropriate incentives: material, professional, social, organizational. The method of peer review was used to determine the basic indicators of personnel incentives evaluation. Calculation of this indicator and its graphical interpretation allow us to determine the influence of group indicators and establish functional relationships between indicators. The use of an integral indicator makes it possible to effectively evaluate incentive measures that directly affect the effectiveness of personnel activity as a factor of competitiveness of the agro industrial complex enterprises.

Keywords: Agro-Industrial Complex Enterprises Personnel Incentives, Integral Indicator, Incentive Matrix, Expert Evaluation.

JEL Classifications: M5, Q2

INTRODUCTION

Formation of strategically important competitive positions of agro industrial complex enterprises on the world market requires the search for new approaches in the management of enterprises on the basis of studying the experience of European countries, which makes it possible to form its own vision of an effective economic incentive mechanism for personnel that affects the efficiency of the enterprise as a whole and ensures an increase in the level of labor productivity.

The relevance of the chosen topic is determined by the need to determine the effectiveness of incentives for personnel to implement the mission of enterprises on the basis of building economic and mathematical models that can improve the existing system of personnel management. In addition, this is the way to improve the system of strategic management of the formation and development of the economic potential of enterprises of agro industrial complex in modern conditions.

REVIEW OF PREVIOUS STUDIES

The possibilities of using the apparatus of economic and mathematical modeling, balanced indicators and other methods for investigating the personnel incentive with the help of economic indicators are considered in the works of foreign scientists: Mathis & Personnel (1991); Torrington & Hall (2000); Tuyen (2010). Mathis & Personnel (1991) they propose to evaluate the incentives of personnel through a system of balanced indicators, including 17 indicators of material and social factors of stimulation. Despite a sufficient number of publications, the issues of evaluation the incentives for the personnel of agro industrial complex enterprises have not been adequately studied. In addition, the level of application of the apparatus of economic and mathematical modeling in determining the incentive system for personnel, promising areas for the development of personnel is not enough.

Modern economic conditions of management of processing enterprises require the maximum expansion and use of forecasting and economic and mathematical modeling, as well as further improvement of the methodology and methods for their development, directly affects the development processes of processing enterprises of the agro industrial complex, their functionality and profit making.

The use of the integral indicator makes it possible to increase the objectivity of the evaluation of incentive measures, directly affects the efficiency of personnel activities. This allows us to analyze the activities of the employee on the basis of functional links and to activate economic behavior in accordance with value orientations, expectations for ensuring the growth of labor productivity.

METHODS

Analysis and development of a model for evaluating the incentives for personnel of agro industrial complex enterprises, applying economic and mathematical methods. The final result of the scientific study is the calculation of the integral indicator of the evaluation of personnel incentives, based on the methods of applied statistics.

RESULTS AND DISCUSSIONS

In modern conditions of management, the main condition for the competitiveness of enterprises is the productive activity of personnel. Personnel have always been and remain the priority strategic resource of the enterprise and therefore the main factor in the formation and ensuring of its competitiveness. Personnel as a priority, strategic, special resource of the enterprise has a complex quantitative and qualitative structure. The further development of information technology also contributes to the transformation of all components of the human resources management system at the enterprise-evaluation, planning, organization, incentives.

Evaluation is an integral part of the personnel management system, it is the process of determining the effectiveness of employees performing their job duties and implementing organizational goals or the process of determining the conformity of the qualitative characteristics of personnel (abilities, skills, motives) to the requirements of a position or workplace (Lewin, 1943). Evaluation of the effectiveness of personnel incentives is a tool through which the enterprises of the agro industrial complex achieve the solution of management tasks: increase sales of products to maximize profits, expand the scope of activities for survival in the market. Personnel evaluation has many goals. The most common is the classification

developed by the well-known human resources development specialist McGregor (1960) which takes into account: administrative, which consists in making personnel decisions on an objective and regular basis-the personnel deployment, their movement and remuneration; informative-providing managers with the necessary data on the quantitative and qualitative composition of the personnel; motivational-the orientation of employees to improve their work in the direction necessary for the organization. The creation of personnel incentive evaluation system, balanced in terms of accuracy, objectivity, relevance, simplicity, convenience and understandability, is a complex multidimensional process, as defined by Aquilano, Chase & Jacobs (2004).

Determination of the list of economic indicators of incentive is proposed using the expert analysis of Edvinsson & Malone (1997); Stewart (1997). Forming an expert group on the basis of a competence approach, taking into account the ranks of positions, allows the formation of a group, in accordance with official duties, it is possible to build a personnel evaluation system in accordance with the objectives of the activities of enterprises. Specific requirements for the members of the expert group make impact on the principles of their selection. To determine the competence of experts it is necessary to evaluate the following qualities: competence, creativity and attitude to expertise, conformism, analyticity, collectivism, self-criticism, reliability.

The method of evaluating the competence of experts is the mutual evaluation of competence based on the pair comparison method. Pair comparison is the procedure for determining the preferences of objects when all possible pairs are compared and further ordering of objects on the basis of comparison results (Johnston & DiNardo, 1996). Based on the results of the competence evaluation, a matrix of experts competence is formed, the elements of which are ranks. This matrix shows the expert's qualifications according to his judgment. But the use of a mutual evaluation of the competence of experts is possible with the existence of such assumptions: lack of conformity among experts-the influence of authorities on judgments; friendly relations; knowledge of the professional competence of each expert. We have chosen a method of competence evaluation based on self-evaluation, which does not require the study of informal communication of experts.

The definition of quantitative and personal composition is a poorly formalized problem, the solution of which is based on the subjective judgment of a specialist responsible for organizing a general procedure for expert evaluation. It is necessary to allocate a compact set of specialists who have close competence ratings. With the help of this compact set, it is possible to define the "center of gravity" and describe a hyper sphere of radius R around it. The magnitude of this radius determines the quantitative and qualitative composition of the expert group. The problem of choosing the value of the radius R is a 2-criterion. First, the degree of agreement between the judgments of the members of the expert group essentially depends on the density of evaluation of the competence of experts. Second, the probability of omitting the original decisions of experts with low competency ratings. But the number of experts affects the accuracy of the group evaluation.

The personal composition of the expert group consists of the total number of applicants and is formed from the most competent specialists who can show the ability to foresee and identify regularities, in our case, the effectiveness of introducing individual means of stimulating the enterprises personnel.

For the purposes of the study, the experts were selected on the basis of the observation that the highest degree of awareness in the question under consideration is given to employees of the higher and middle level of enterprise management when the average error when the expert is included or excluded is 0.2.

The formation of a system for personnel incentives evaluation begins with the implementation of the distribution of indicators into groups. The structuring of the personnel incentive evaluation indicators is performed in four groups according to the pyramid of the needs of Abraham Maslow: physiological needs; social needs; recognition needs; self-fulfillment needs. The physiological needs are presented by material incentives, social needs are presented by social incentives, recognition needs are presented by professional incentives; self-fulfillment needs are presented by organizational incentives.

So, according to certain expert evaluation, 4 groups were formed in terms of personnel incentive evaluation in accordance with the characteristics of incentives for the enterprise personnel: material, professional, social, organizational.

Based on the existing system of indicators, the calculation of the integral indicator of the enterprise personnel incentives evaluation is carried out according to the formula:

$$I_{stimul} = \sum_{i=1}^{4} \left(\beta_{mater} \times I_{mater} \times \beta_{prof} \times I_{prof} + \beta_{soc} \times I_{soc} + \beta_{org} \times I_{org} \right) \qquad (1)$$

Where, I_{stimul}-Resumptive integral indicator of the personnel incentives evaluation; $I_{mater}, I_{org}, I_{soc}, I_{prof}$ -group integral indicator of the personnel incentives evaluation; $\beta_{mater}, \beta_{org}, \beta_{soc}, \beta_{prof}$ -coefficients of influence of group integral indicators of the personnel incentives evaluation of the appropriate incentive means (material, organizational, socio-psychological).

The measurement limits of the integral indicator of the personnel incentive evaluation I_{stimul} are in the range [0; 1].

To compare the indicators of different groups, we bring them to the normalized form so that the changes occur in the range from 0 to 1 (Johnston & DiNardo, 1996). For this we used formula:

$$l_{i,j} = \left(1 + e^{\frac{\overline{x_j} - x_{i,j}}{\sigma(x_j)}} \right)^{-1} \qquad (2)$$

Where, $x_{i,j}$ and $l_{i,j}$-initial and normalized value of the *j*-indicator for the *i*-enterprise; x_j-the average value of the indicator x_j on the sample; $\sigma(x_j)$-corresponding standard deviation.

Normalization of data allows us to calculate the resumptive integral indicator of the evaluation of personnel incentives for its components with the corresponding weighting coefficients. We will give an example of calculation of the group integral indicator of the personnel incentive evaluation according to the proposed methodology. The matrix of means of material incentive in the formalized form (I_{mater}):

$$I_{mater} = \begin{pmatrix} corr(s1,s1) & corr(s1,s2) & corr(s1,s3) & corr(s1,s4) & corr(s1,s5) \\ corr(s2,s1) & corr(s2,s2) & corr(s2,s3) & corr(s2,s4) & corr(s2,s5) \\ corr(s3,s1) & corr(s3,s2) & corr(s3,s3) & corr(s3,s4) & corr(s3,s5) \\ corr(s4,s1) & corr(s4,s2) & corr(s4,s3) & corr(s4,s4) & corr(s4,s5) \\ corr(s5,s1) & corr(s5,s2) & corr(s5,s3) & corr(s5,s4) & corr(s5,s5) \end{pmatrix} \qquad (3)$$

Where *s*-indicators of incentives for personnel, the list of which is determined through expert analysis; *s1*-average salary index, share; *s2*-share of premiums, surcharges and allowances in the total fund of personnel salaries, share; *s3*-share of additional payment, rewards and

compensation payments in the fund of personnel salaries, share; *s4*-share of the social development fund (compensation for the housing expenses, the expenses for rest, etc.) in total personnel expenses, share; *s5*-share of the amount of bonus payments for submitted ideas, rationalization proposals, new solutions to the total amount of bonus payments for the enterprise, share.

The calculation of the matrix of means of material incentive (I_{mater}) can be carried out using the package 'Data Analysis' MS Excel. Indicators of the group of professional incentives through expert analysis are: the share of advanced training expenses in total personnel expenses; the share of the costs of training new professions in total personnel expenses; the share of personnel from the personnel reserve of the enterprise appointed to the target position; share of the amount of the scholarship program in total personnel expenses. Accordingly, indicators of social incentives include such indicators: share of life and health insurance expenses, medical care in general social expenses; the share of expenses for the provision of decent living conditions (compensation of the cost of housing, the provision of loan free of interest for the purchase of housing, the provision of cars for use, etc.) in total social expenses; the share of cash benefits to socially unprotected individuals in total social expenses. Indicators of organizational incentives: the share of the average personnel salary engaged in innovation at the enterprise, to the total amount of the salary fund; management load coefficient-the ratio of the number of management staff to the total number of personnel; level of introduction of modern means of labor, information technologies in the enterprise-the ratio of the time of use of modern labor means, information technology (office equipment, Internet technologies) in labor and the total operating time of personnel.

The corresponding coefficients of influence on the resumptive integral indicator of the personnel incentive evaluation are calculated by the formula:

$$K_1 = \left[\left(X_1^T . X_1 \right)^{-1} . X_1^T \right]^T . I_{stimul} \quad (4)$$

Where X_1-indicators matrix; K_1-coefficients of influence on the resumptive integral indicator of the personnel incentive evaluation, consisting of the appropriate groups of personnel incentive means; *T*-transportation of the matrix indicators of personnel incentive means.

The integral indicator of personnel incentive evaluation allows determining the influence of group indicators of personnel incentive means on the integral indicator establishes functional relationships between the indicators. The level of functional connection between the indicators of personnel incentives can be divided into ranges of values: high feedback $\in [-1;-0.5]$, average feedback $\in [-0.5;0]$, no feedback-0, average straight $\in [0;0.5]$, high straight connection $\in [0.5;1]$. Graphically, the level of functional connection between the indices of personnel incentives in three-dimensional space can be traced from the emergence (high straight connection) to the trough (high feedback).

Enterprises that have a high integral indicator of personnel incentive evaluation (I_{stimul}), stable functioning, there are opportunities for effective development, does not require the development and implementation of additional activities of the personnel incentive mechanism. If the indicator (I_{stimul}) has an average value, the state of the enterprise is relatively stable; there is provision to improve the personnel incentive mechanism (financial, informational, professional etc.). Low level of efficiency of personnel management, which largely does not meet the conditions for ensuring the effectiveness of personnel, limited support for the improvement of the personnel incentive mechanism, is typical for enterprises with a low integrated indicator of

personnel incentive evaluation. The state of the enterprise is extremely unstable, an inefficient incentive mechanism, there is no some/all provision for the effectiveness of personnel when the indicator is calculated by the formula 1 is in the range of values $I_{stimul} \in [0;0.29]$. The selection of the most influential factors of the medium can be done using the J. Wilson matrix, which shows the relationship between the probability of gain and the force of influence of the factor.

At the same time, it is necessary to pay attention that stimulation of labor activity is carried out on two levels: first-this is the stimulation of each person, second-stimulation of the entire collective of workers as the spread of synergistic effect. At both levels, the manager must identify the incentives means to increase productivity. The HR manager should form an effective incentive system as part of the HR management system. So, the labor incentive implies the creation of conditions under which active labor activity becomes a necessary condition for satisfying the significant and socially conditioned needs of personalities, the formation of motives for labor.

CONCLUSIONS

In order to ensure labor productivity, the conceptual model of personnel incentives was improved, which takes into account the parameters of the mechanism and its features and allows increasing the efficiency of enterprises. According to certain expert evaluations, four groups of indicators were formed in accordance with the characteristics of personnel incentive means: material (physiological needs), professional (recognition needs), social (social protection), organizational (self-fulfillment needs).

A comprehensive methodology developed can be used for strategic and tactical planning of incentives for enterprise personnel, which will have an impact on improving the quality of work. Thus, taking into account the foregoing, it can be concluded that modeling is the basis of economic activities and management decisions of agricultural enterprises in order to improve the efficiency of the use of human resources. In addition, there is a problem of the theoretical and methodological justification for using modeling as a necessary component of management in the current market conditions for the functioning of enterprises of the agro industrial complex, which requires further research on the methods, methodology and technology of justify forecasting and modeling of social development of processing enterprises.

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