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Skrynkovskyy R. M., Sopilnyk L. I., Hladun V. R. Improving the Model of Wages Regulation at Industrial Enterprises Depending on the Level of Productivity and Efficiency of Staff Work in the System of Production Management

The object of the research are details of formation, use and improvement of the economic-mathematical model of wages regulation at industrial enterprises depending on the level of productivity and efficiency of staff work in the system of operational (production) management. The main internal variables of enterprise are considered. It is determined that employees are the most important situational factor in the system model of interconnection of internal variables, and therefore their labor should be valued properly and be adequately paid for. It is identified that in practice there are problems connected with formation and use of applied mechanisms for regulation of wages at industrial enterprises in accordance with the structurally-functional business model of process of formation of systems of material labor incentives. It is determined that one of the main objectives of the system of material incentives at industrial enterprises is ensuring the correlation between quantity, quality, growth of labor productivity and the received wages. The economic-mathematical model of wages regulation at industrial enterprises is improved depending on the level of productivity and efficiency of staff work in the system of production management.

Keywords: regulation of remunerations at enterprise, material stimulation of labor, labor productivity, labor efficiency, correlation of labor productivity and wages growth, operational (production) management.

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Skrynkovskyy Ruslan M. – PhD (Economics), Associate Professor, Associate Professor of the Department of Business Economy and Information Technology, Lviv University of Business and Law (99 Kulparivska Str., Lviv, 79021, Ukraine)

E-mail: uan_lviv@ukr.net

ORCID: http://orcid.org/0000-0002-2180-8055


Скрыньковский Р. Н., Сопильник Л. И., Гладун В. Р.

Совершенствование модели регулирования оплаты труда на промышленных предприятиях в зависимости от уровня производительности и эффективности труда персонала в системе производственного менеджмента

Объектом исследования являются особенности формирования, использования и совершенствования экономико-математической модели регулирования оплаты труда на промышленных предприятиях, а также обеспечение оптимального соотношения между размером заработной платы, материалами стимулирующего воздействия и эффективностью труда персонала. Результаты экспериментов подтверждают, что при определении оптимального размера заработной платы и стимулирующего воздействия необходимо учитывать внутренние переменные на предприятии. В частности, на предприятии выделены основные внутренние факторы, влияющие на эффективность труда персонала, а также разработана новая структурно-функциональная бизнес-модель процесса формирования оплаты труда персонала. Установлено, что стимулирующее воздействие, определяющее размер заработной платы, должно быть рассчитано с учетом влияния на производительность работников.

Ключевые слова: регулирование оплаты труда, материальная стимуляция, производительность труда, эффективность труда, структурно-функциональная модель предприятий.
As is known, the internal environment of industrial enterprises is determined by internal variables (or factors of the internal environment), which are closely interrelated and form a system model (structural and functional one) [1–3]. According to the viewpoint of American economists [2], the main internal variables in any enterprise are:

1) employees (people);
2) goals (expected result);
3) organizational structure of management;
4) tasks;
5) technologies in the system “input (information, resources, time) – output (result, responsibility)” [1].

At the same time, it is worth noting that employees (people) are the most important situational factor in the system model of interrelationships among internal variables and are the main capital of any modern manufacturing enterprise. Therefore, their work must be properly assessed and adequately paid (depending on productivity and efficiency of their labor) [1; 4–6].

Based on the analysis of literary sources [4–6] and the practice of doing business, it is established that today there is no single generally accepted integrated (systems, specific, rational) approach to measuring labor efficiency in industrial enterprises which would take into account factors comprising the incentive wage systems (IWSs). At the same time, from the functional prospective of operational (production) management [1; 2; 5], the practice indicates the presence of theoretical and practical problems associated with the formation and use of applied mechanisms for wage regulation in industrial enterprises in accordance with the structural and functional business model of forming IWSs. Here, in the opinion of top managers, the methods of expert assessment, economic and mathematical modeling of the problem are gaining particular importance. All this has conditioned the practicality and relevance of conducting research in this area. It has also determined the object of the study – features of the formation, use and improvement of the economic and mathematical model for wage regulation in industrial enterprises depending on the level of productivity and efficiency of the staff in the operational (production) management system.

Therefore, the aim of the work is forming theoretical provisions and developing practical recommendations to improve the economic and mathematical model for wage regulation in industrial enterprises depending on the level of productivity and efficiency of the staff in the production management system.

In the process of research, the following general scientific and special formalized and non-formalized methods were used [7]:

1) methods of systems analysis, systematization, generalization and specification, graphical method and method of intertemporal comparisons – to clarify the essence of the categories “financial stimulation of labor”, “labor productivity”, “labor efficiency” and “relationship between the growth in labor productivity and wages”;

2) methods of expert assessment and economic and mathematical modeling – to form (construct) the economic and mathematical model for wage regulation in industrial enterprises depending on the level of productivity and efficiency of the staff in the system of operational (production) management.

The results of studies [1; 6; 8], with consideration for the analysis of the main forces (factors) operating in the microenvironment of industrial enterprises (Fig. 1), allow to conclude that one of the most important forms of motivation in enterprises is financial stimulation of labor, which involves:

1) formation and use of an IWS (Fig. 2). The use of an IWS includes [1]: implementation of the IWS; management of the IWS.

In this context, in accordance with the presented business model of forming an IWS (see Fig. 2), taking into account the information [1; 4; 6; 8] and expert opinion, we recommend to express an improved economic and mathematical model of the structure (regulation) of wages (Z) in industrial enterprises (depending on the level of productivity and efficiency of labor in the “information-resource-time” result system) using formula (1) [1; 8]:

\[
Z = Z_{11} + Z_{12} + Z_{13} = Z_{21} + Z_{22} = (Z_{31} + Z_{32}) + (Z_{33} + Z_{34}),
\]

where:

- \(Z_{11}\) is the basic wage;
- \(Z_{12}\) – extra wage;
- \(Z_{13}\) – other payments (incentive, compensation ones) in the system “data – information – knowledge – result”;
- \(Z_{21}\) – share of the wage which stimulates the factors of labor input in achieving current results in the system “effect (action) – result”;
- \(Z_{22}\) – share of the wage which stimulates the factors of labor input in achieving final results in the system “goal – means – result”;
- \(Z_{31}\) – share of the wage (35–60%) which stimulates the fixed factors of labor input;
- \(Z_{32}\) – share of the wage (15–20%) which stimulates the variable factors of labor input;
- \(Z_{33}\) – share of the wage (10–20%) which stimulates the factors of labor input in achieving final results in terms of quantity;
- \(Z_{34}\) – share of the wage (20–25%) which stimulates the factors of labor input in achieving final results in terms of quality [1; 8].
At the same time, it has been determined that labor efficiency is the ability to ensure effectiveness (effect) of labor (process, project, etc.) which is calculated as the ratio of the effect (result) to costs spent to ensure this result in the system “information-resource-time” [8; 13–17]. Here, the ratio of the growth in labor productivity (the indicator characterizing the effectiveness of labor input, performance of employees in the production process for a certain period of time [8, 18]) to the wages of employees in industrial enterprises [1; 4; 8] is of importance.

Thus, the relationship between the growth in labor productivity and wages is a dependence characterizing the level of growth in labor productivity by 1.0% of the increase in wage [8]. It is estimated using the parameter (ratio) of the growth in labor productivity to the average wage \( K_v \) – formula (2):

\[
K_v = \frac{P}{P_0} \cdot \frac{Z}{Z_0} = \frac{I_p}{I_z},
\]  

where \( P \) is the labor productivity in the reporting period; \( P_0 \) – base-period productivity; \( Z \) – wage in the reporting period; \( Z_0 \) – wage in the base period; \( I_p \) – index of labor productivity; \( I_z \) – wage growth index [8].

In view of this, it was found that one of the most important conditions for increasing production efficien-
cy is a higher growth rate of labor productivity as compared to that of wage [8; 13].

Based on the results of researches [1; 4–6], it can be argued that there is an objective need to stimulate the factors which determine labor input in achieving both current and final results, namely:

1) economic;
2) organizational;
3) socio-psychological ones (see Fig. 2).

Taking into account the above, it should be noted that as a result of a violation of the requirements of the Ukrainian legislation on remuneration, the following types of legal liability may be applied to guilty persons (heads of enterprises, institutions, organizations regardless of form of ownership):

- disciplinary;
- financial;
- administrative;
- criminal [19].

The presented study should be taken into account when improving diagnosis of the system for motivation and stimulation of labor activity of staff in industrial enterprises to form and maintain (or search for new) management decisions in the system of operational (production) management (taking into account the classification and content of substantive and procedural theories of motivation [1; 19–22] and information in [6; 23]).

CONCLUSIONS

Based on the results of the study, it has been established that financial stimulation of employees is a process of forming and using incentive wage and wage distribution systems. One of the main goals of incentive wage systems in industrial enterprises are to ensure that wages of employees be in correspondence with the quantity and quality of labor (based on assessing the level of productivity and efficiency of labor). Here, labor efficiency should be understood as the ability to ensure effectiveness (effect) of labor (process, project, etc.) which is calculated as the ratio of effect (result) to costs spent to ensure this result in the “information-resource-time” system. And labor productivity is characterized by performance of employees in the production process for a certain period of time.

The scientific novelty of the research is in improving the economic and mathematical model of wage regulation in industrial enterprises (depending on the level of productivity and efficiency of the staff in the production management system), which, unlike existing ones, takes into account:

1) the process of formation of IWSs in the system of operational (production) management;
2) the ratio of growth of labor productivity and wages of employees;
3) factors that determine labor input in the achievement of both current and final results in terms of quantity and quality of labor.

LITERATURE
