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DETERMINATION OF PRIORITY QUALITATIVE FACTORS OF STIMULATION OF THE WORK OF ENTERPRISE TOP MANAGERS

The article is devoted to substantiation of the main subjective qualitative factors which are typical for labor incentives of managers of the strategic level of enterprises management, and which it is reasonable to take into account while developing the system of economic incentives of their activity, since basing and determination of the incentives amount only on the statistical objective information is not able to influence significantly the final results of top-managers work. The **purpose** of the article is to identify priority qualitative factors of influence on the process of economic stimulation of the activity of top managers of industrial enterprises and their quantitative interpretation based on the combination of qualitative assessments into an integral indicator. The **tasks** of the article are the analysis of the results of the survey of top managers on individual qualitative factors of influence on their motivation, the definition of statistical relationships between factors, determining the explicit and latent trends in the dynamics of these factors, the calculation of the integral indicator of the impact of the identified significant factors, the formation of methodological support to identify priority qualitative factors of economic incentives performance of top managers of industrial enterprises. The **object** of the article is the process of economic stimulation of the results of activity of top managers of industrial enterprises. The **subject** of the article is the theoretical provisions, methodological support, and practical proposals for economic incentives for managers of the strategic level of administration at industrial enterprises. **Methods.** To achieve the goal, the article used the following basic general and special research methods: theoretical generalization, questionnaire survey, descriptive statistics tools, Spearman rank correlation coefficient, multivariate factor analysis, method for calculating the integral index of qualitative factors of managers' labor stimulation, graphical method. **Results.** The results of the study are: the scientific achievements of the predecessors on the formation and use of performance indicators of enterprises as indicators of incentives for top managers; surveyed top managers of industrial enterprises regarding their opinions on the main factors influencing the performance of their own activities; proved the relationship of influence factors on the incentives of top managers presented in the questionnaire; clear and latent tendencies of interrelation of factors of influence on productivity of managers of strategic level of the enterprises are revealed; the integrated indicator of qualitative factors of stimulation of work of managers is defined, quantitative values of which have proved existence of insufficient account of factors on process of stimulation. **Conclusions.** As a result of determining the relationship between the qualitative factors influencing the economic incentives of top managers developed methodological support, which differs: the content of qualitative factors; analysis of the structure of the studied set of arrangements of answers of experts using the tools of descriptive statistics; assessment of the closeness of the relationship between qualitative factors of economic incentives for top managers in the dynamics; assessment of the consistency of the answers of experts in the dynamics; identification of latent factors of economic stimulation of top managers; analytical method of developing an integrated quality indicator of economic stimulation for top managers.

Keywords: stimulation of labor; top manager; industrial enterprise; qualitative factors; the relationship between the qualitative factors; methodological support.

Introduction

The success of enterprise activity depends on many factors, among which there are objective, such as efficiency of economic resources use, qualification of workers, organization of production processes, and subjective, connected with human perception of events, interest of workers, their motivation and used incentive systems, validity of rewards, criterion indicators of their purpose. If objective factors are studied widely enough, then subjective factors are given more. Research concerning the development of proposals on the formation and use of incentive systems for production personnel is more widespread, while almost no attention is paid to the stimulation of managers, especially strategic level managers. Economic stimulation of this category of personnel is usually connected only with an enterprise profit and other indices of its finite activity. Therefore, there is an objective necessity in development of the system of stimulation of top managers and their building not only on traditional indicators, but also on the indicators of qualitative type having subjective nature.

Analysis of publications

In the works of many scientists [1, 8 - 13] it is noted

that in modern conditions stimulation of top managers' work is one of the determining functional components of enterprise management and its development. This is explained by the increasing role of the human factor in ensuring the company's competitiveness, its effective activity both on internal markets and on external ones [8, 12]. Formation of the mechanism of motivation and economic stimulation of personnel will have a positive impact on labor efficiency, and it will be reflected in all business processes and results of enterprise activity, and, consequently, will allow increasing its profitability and profitability.

In the organization and implementation of economic stimulation of top managers' work, an important role is played by the assessment of their work. Scientists note [9, 10] that personnel assessment in the system of economic stimulation should be performed taking into account the action of objective laws that regulate an employee's behavior. This is pointed out by the vast majority of scientists, for example, T. Momot, etc. [17]. At the same time, the authors [14] consider the presence of technological competences and their social responsibility in relation to their subordinates to be important features of managers' labor stimulation. Researchers in their work [15] suggest that in order to motivate managers their management style should be evaluated, which should

correspond to a certain situation at an enterprise. At the same time, it is advisable to adapt the management style to the goals of the enterprise, its chosen strategy [16]. Moreover, according to the achieved results of the strategy to stimulate enterprise managers depending on their personal contributions to the achieved results. To provide effective economic stimulation of personnel based on its assessment at all levels of economic structure the assessment mechanism should be carried out on the principles of universality, consistency, comprehensiveness, fairness, comparison [1]. It causes the objective necessity to determine the qualitative factors of economic stimulation of top managers' work, which causes the necessity to formulate such purpose of the article, its object and subject.

The aim of the article is to identify priority qualitative factors of influence on the process of economic stimulation of activity of top managers of industrial enterprises and their quantitative interpretation based on qualitative assessments into an integral indicator. The object of the article is the process of economic stimulation of the performance of top managers of industrial enterprises. The subject of the article is the theoretical provisions, methodological support, and practical proposals for economic incentives for managers of the strategic level of administration of industrial enterprises.

Specialists in solving the problems of economic stimulation of personnel labor believe that wages cannot be the only goal of labor activity and speak about the system of economic stimulation. The system of economic stimulation of top managers at an enterprise should be based on the following basic principles [2]:

- communication, cooperation and agreement between the top managers and the management of the enterprise on the general principles of the system;
- a substantiated system of performance evaluation of top managers and definition of its indicators;
- substantiated and established criteria for defining and evaluating the work of top managers;
- substantiated standards, their control and periodic revision;
- a clear coordination of economic stimulation of top managers with the performance of the enterprise;
- material incentives, especially additional ones, not for the level of performance in general, but precisely for the achievement of qualitative results of activity.

Consequently, it is necessary to take a systematic approach to economic incentives for top managers, implementing seven key steps, namely: identification of economic problems of the enterprise arising from the lack of economic incentives and expressed in low labor efficiency, staff turnover, an unfriendly atmosphere within the team; making a list of key objectives of the enterprise, involving an increase in labor productivity, raise the team spirit, the formation of a cohesive team; conducting social diagnostics based on a questionnaire survey, as a result of which material and non-material stimuli are specified, which are needed both for each individual top manager and for their entire team; based on the results of social diagnostics, developing a sequence of economic stimulation measures; determining financial costs for

implementing measures of economic stimulation of top managers; informing top managers on the implementation of measures of economic stimulation system for detailed information about charges in the bonus system; approbation of this system of economic stimulation of labor of top managers and establishment of the ratio between costs and received profit from implementation of measures, and further elimination of troubles and problems that have appeared in the process of implementation [3].

Despite the significant amount of works of famous specialists, many issues of economic stimulation of labor of top managers remain unsolved and insufficiently grounded; it concerns both understanding of the process of economic stimulation itself, as well as peculiarities of forming forms, methods, and recommendations on improvement of the economic stimulation of labor at enterprises.

Leshchenko L.O. recommends apart from direct and indirect economic stimulation to distinguish social motivation, when an employee understands that he is part of the team; psychological motivation, when a friendly and welcoming atmosphere is observed in the team; career motivation, when conditions for career growth exist in the team; educational motivation, when employees are interested in training and development [4].

Research results

Among the factors of economic stimulation of top managers' labor, a special place is held by qualitative factors that take into account the behavior, personal expectations, perceptions and values of each individual. Consideration of qualitative factors of economic stimulation of top managers' labor is carried out through the study of qualitative features of their activity, namely: rational and emotional components of activity; special and typical behavioral patterns of top managers; identification of unrealized needs in the process of activity; development of new methods of material stimulation. Quantitative factors are based on a rational approach to economic stimulation, and qualitative factors take into account each individual's motivation, unique social experience, his abilities and many other features of this subject that make up his "life world". Exactly qualitative factors of economic stimulation of top managers are directed on the clarification of subjective-specific factors of activity, on understanding of those moments, which the staff is guided in its activity.

It should be noted that many scientists believe that in order to improve the overall effectiveness of the enterprise, in addition to material stimulation, there is the implementation of qualitative factors of economic stimulation of work of top managers, namely, such factors as term of employment as a top manager, the level of compensation for increased economic stimulation of labor, satisfaction with the existing system of economic stimulation at the enterprise, the level of compensation, the main economic stimulating factor of labor, factor of current material rewards, current factor of influence on the receipt of monetary compensation, negative factors

affecting the bonus system at the enterprise. These qualitative factors will increase organizational loyalty, responsibility, and willingness to work more efficiently. The purpose of considering qualitative factors is to increase:

- employee satisfaction by obtaining greater economic stimulation of top managers' work;

- needs of employees in growth, development and self-expression by means of getting higher satisfaction with existing system of economic stimulation at the enterprise;

- team building based on the increase of the existing material rewards;

- commitment of employees to work, striving to achieve the general corporate goals due to the main economic stimulating factor of labor;

- striving for training and development of the personnel potential on the basis of improvement of the bonus system at the enterprise.

Consequently, to increase the level of economic incentives for top managers and determine the qualitative factors it is necessary to develop a questionnaire, and the answers to the questions of the questionnaire will help to better understand the desire of employees, their needs, desires, with which you can implement certain changes that will reduce staff turnover and will help to attract new employees - managers of the strategic level of management. The questionnaire formed questions, the answers to which should be given in points. It is known that psychologists, sociologists, and economists have developed various methods for establishing scores for a qualitative attribute. However, almost all of them are based on the well-known studies of E. Weber, G. Fechner, S. Steven. In 1846, E. Weber formulated a law related to the stimulus of the measured value s . E. Weber's law states that a change in perception is manifested when the stimulus is increased by a constant fraction of the stimulus itself. This law is valid when Δs is small compared to s , but practically ceases to be valid when s is either very small or very large. Saaty believes that synthesizing or decomposing stimuli, traceable to clusters or levels of hierarchy, is an effective means of extending the application of this law [5, p. 68]. According to T. Saaty, we have the following explanations for measuring the essence of factor scores:

1 - equal significance (two actions contribute equally to the goal); 3 - a certain advantage of significance of one action over another (weak significance) (experience and judgment give a slight advantage of one action over another); 5 - significant or strong significance (experience and judgment give a significant advantage of one action over another); 7 - very strong or obvious significance (the advantage of one action over another is very significant. Its superiority is almost obvious); 2, 4, 6, 8 - intermediate values between adjacent values of the scale (a situation where a compromise decision is needed); inverse values of the above numbers - if action i is assigned one of the above numbers in comparison with action j , then action j is assigned an inverse value in the comparison with i (a reasonable guess); rational values - relations arising in a given scale (if consistency is postulated, then n numerical values are needed to obtain the matrix).

G. Fechner found that stimuli with noticeable differences are placed in a geometric progression, and the corresponding perceptions constitute an arithmetic progression at discrete points where barely noticeable differences are observed. Stimuli arise in the process of pairwise comparisons relative to comparative actions. The Weber-Fechner psychophysical law results in a sequence of 1, 2, 3, ... There are about five with additional ones making up the trade-offs between neighboring reactions. This increases the number of differences to nine, which is consistent with the order-of-magnitude predictions. Malyarets L.M., who also believes that it is appropriate to use the five-point system [6], gives a detailed analysis of the measurement of ordinal features in the monograph. The established points (for example, 1, 2, 3, 4, 5) are the expression of nominations of qualitative property of object (in the example: very low (1), low (2), moderate (3), strong (4), very strong (5)).

Consequently, in order to determine the priority of factors, a questionnaire was developed, in which questions were included and a survey of top managers of enterprises was conducted. At the same time, it can be considered that these top managers are experts due to their high level of professionalism, so their answers can be considered as experts' answers. The content of the questions of the questionnaire describing the main reasons for economic incentives for top managers is presented in table 1. The answers to the questions of the questionnaire are presented on a five-point scale.

Table 1. Questionnaire questions describing the main qualitative factors of economic incentives for top managers and their scale

No.	Question	Meaning of the value	Explanations
1	How long have you worked as a top manager? Where:	1	Less than 1 year
		2	Over 3 years
		3	Over 5 years
		4	Over 10 years
		5	5 years
2	Rate on a scale of 1-5, how does your pay level affect your economic stimulation?	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly

The end **Table 1.**

3	On a scale of 1-5, are you satisfied with your economic stimulation system?	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly
4	Evaluate on a scale of 1-5, are you satisfied with your pay?	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly
5	Evaluate on a scale of 1-5, what is the most effective economic incentive for you to work?	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly
6	Evaluate on a scale of 1-5, what types of material rewards you receive most influence you?	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly
7	Evaluate on a scale of 1-5 points which factors are more influential in receiving your monetary reward.	1	very weakly
		2	weakly
		3	sufficiently
		4	significantly
		5	very strongly
8	Identify the main problems of the bonus system at your company on a scale of 1-5 points?	1	Weak link between communication goals
		2	Lack of understanding of the rewarding principles
		3	Incomprehension of the goals set
		4	Conflict (overlapping) of goals
		5	Strong conflict

The level of labor of top managers is influenced by qualitative factors, namely: the period of work in the position of a top manager (z_1), the level of remuneration for increasing economic stimulation of labor (z_2), satisfaction with the existing economic stimulation system at the enterprise (z_3), the level of labor compensation (z_4), the main economic stimulating labor factor (z_5), the factor of effective material rewards (z_6), the effective impact factor for monetary rewards (z_7), negative factors affecting the bonus system at the enterprise (z_8). The values of these qualitative factors are measured in ordinal scales. Specialists of economic and mathematical methods and data analysis in economics consider that the main tasks of the theory and practice of measuring ordinal values are: analysis of the structure of the investigated set of orderings (task A); analysis of integral (aggregate) consistency of variables and their conditional ranking by the criterion of the degree of close connection of each of them with the remaining variables (task B); construction of a single group ordering of objects on the

basis of the available set of consistent orderings (task C)[6].

Therefore, the first step in determining the qualitative factors of economic incentives for the work of top managers is their description at each enterprise under study annually. To describe the qualitative factors we use the tools of descriptive statistics used for qualitative attributes measured in ordinal scales. Thus, the analysis of the structure of the studied population of ordering of experts' responses to qualitative factors of economic incentives is an important step, which is carried out by means of univariate distribution, which allows summarizing the frequency with which different values of a certain variable are observed in the data set. In addition, this is done through the operation of tabulation or cross-tabulation [6]. Thus, visualization of the characteristic of economic incentives for the work of top managers on eight qualitative factors in the Private Joint Stock Company " Kharkiv Stamp and Mold Plant" according to the opinion of 10 experts in the first year of the study is shown in fig. 1:

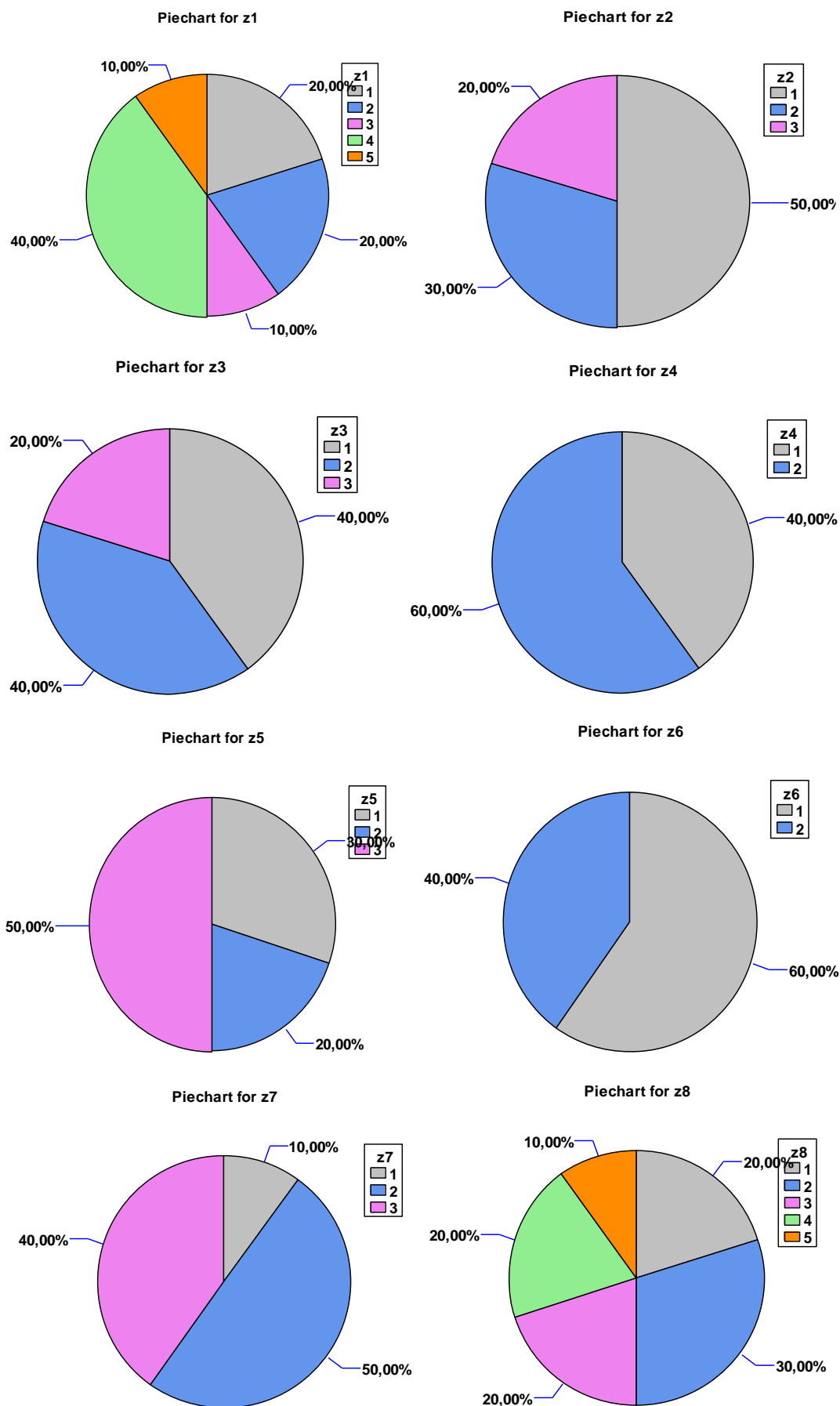


Fig. 1. Relative frequency of levels of qualitative factors of economic stimulation of the top managers of the company Private Joint Stock Company «Kharkiv Stamp and Mold Plant" in the first year of the study (in %)

So, the experts believe that the following situation is observed at this enterprise on economic stimulation of labor of top managers: mostly the employees have more than 10 years of work experience in the position of top manager, there is a very weak influence of salary level on the increase of economic stimulation of labor, absolutely not satisfied with the existing system of economic stimulation at the enterprise, mediocre satisfied with the level of salary, factor of the current material rewards is very weak, the factor of current material rewards is very weak, the current factor of influence on the receipt of monetary rewards is weak, among the negative factors that

affect the bonus system at the enterprise is the predominant misunderstanding of the principles of bonuses.

Table 2 shows the results of the analysis of diagrams of all eight qualitative factors of economic incentives for top managers at the enterprise during the entire study period. Table 2 shows the values of qualitative factors that have the highest frequency according to experts, if there are two, the average value is indicated, as well as the value of the concordance coefficient (CC), which indicates the consistency of experts' opinions.

Table 2. Dynamics of qualitative factors of economic stimulation of the work of top managers at the enterprise Private Joint Stock Company "Kharkiv Stamp and Mold Plant"

Year	Qualitative factors (z)								KK
	1	2	3	4	5	6	7	8	
1	4	1	1,2	2	3	1	2	2	0,64
2	3	1	2,3	1	2	1	1	4,5	0,45
3	3,4	2	2	1	2	2,3	3	5	0,55
4	4	1,2	1	1	2	2	2	5	0,62
5	5	2,3	2	2	2	3	1	1	0,68
Average value	3,9	1,6	1,8	1,4	2,2	1,9	1,8	3,5	

Thus, at the enterprise during the whole period of the research the term of employment of the top management personnel is more than 10 years, there is also a weak impact of the level of salary on the increase of economic stimulation of labor, top managers are also weakly satisfied with the level of wages, the weak main economic incentive factor of labor, the weak factor of the current material rewards, the weak current factor of influence on the monetary reward, among the negative factors affecting the bonus system at the enterprise preferable is a conflict, that is, the inconsistency of the principles of bonuses.

Further, it is advisable to continue this analysis of the qualitative factors of economic incentives of top managers by analyzing the paired and multiple relationships in the system of factors, and therefore, it is necessary to calculate the coefficients of rank correlation. The analysis of the relationships of ordinal variables is based on different variants of probability space models, in which the role of the space of elementary results (consequences)

is performed by the set of all possible combinations of n elements (n – the number of statistically studied objects). Traditionally, Spearman's or Kendel's rank correlation coefficients have been used as the main characteristics of the paired statistical relationship between orders. As we know, the first to propose a solution to the problem of testing the hypothesis of the independence of ordinal features psychologist Charles Spearman in 1900. The second most popular rank correlation coefficient, the Kendall coefficient, uses as a measure of similarity between two rankings the minimum number of permutations of neighboring objects that need to be done to transform one ordering of objects into another. In the table 3 presents the value of Spearman's correlation coefficient for assessing the closeness of the relationship of questions in the questionnaire, which characterize the main factors of economic stimulation for top managers at the enterprise Private Joint Stock Company "Kharkiv Stamp and Mold Plant".

Table 3. The value of Spearman's rank correlation coefficient in assessing the closeness of the relationship between the questions in the questionnaire of the first year of the study

The value of Spearman's rank correlation coefficient according to the qualitative factors of the questionnaire								
	z1	z2	z3	z4	z5	z6	z7	z8
z1		-0,2186 (10)	-0,0269 (10)	0,0369 (10)	-0,3690 (10)	-0,5904 (10)	-0,8350 (10)	-0,5692 (10)
		0,5119	0,9356	0,9118	0,2683	0,0765	0,0122	0,0877
z2	-0,2186 (10)		0,0352 (10)	0,1543 (10)	0,1357 (10)	0,3472 (10)	0,2291 (10)	0,2622 (10)
		0,5119	0,9159	0,6434	0,6839	0,2976	0,4918	0,4315
z3	-0,0269 (10)	0,0352 (10)		-0,3043 (10)	-0,3240 (10)	0,2282 (10)	-0,1076 (10)	0,5635 (10)
		0,9356	0,9159	0,3613	0,3311	0,4936	0,7469	0,0909
z4	0,0369 (10)	0,1543 (10)	-0,3043 (10)		-0,5015 (10)	-0,1667 (10)	0,3536 (10)	-0,0726 (10)
		0,9118	0,6434	0,3613	0,1325	0,6171	0,2888	0,8275
z5	-0,3690 (10)	0,1357 (10)	-0,3240 (10)	-0,5015 (10)		0,3086 (10)	-0,0764 (10)	0,1378 (10)
		0,2683	0,6839	0,3311	0,1325	0,3545	0,8188	0,6792

The end **Table 3.**

z6	-0,5904	0,3472	0,2282	-0,1667	0,3086		0,3536	0,8352
	(10)	(10)	(10)	(10)	(10)		(10)	(10)
	0,0765	0,2976	0,4936	0,6171	0,3545		0,2888	0,0122
z7	-0,8350	0,2291	-0,1076	0,3536	-0,0764	0,3536		0,3595
	(10)	(10)	(10)	(10)	(10)	(10)		(10)
	0,0122	0,4918	0,7469	0,2888	0,8188	0,2888		0,2808
z8	-0,5692	0,2622	0,5635	-0,0726	0,1378	0,8352	0,3595	
	(10)	(10)	(10)	(10)	(10)	(10)	(10)	
	0,0877	0,4315	0,0909	0,8275	0,6792	0,0122	0,2808	

Consequently, in the first year of the study, the current material rewards factor (z6) and the negative factors affecting the bonus system at the company (z8), as well as the period of employment as a top manager (z1) and the current influence factor on monetary rewards (z7) are closely correlated. The analysis of the calculated Spearman correlation coefficients between the factors of economic stimulation of top managers at the enterprise Private Joint Stock Company " Kharkiv Stamp and Mold Plant" during the rest of the study showed that there are such close relationships between qualitative factors of economic stimulation of top managers, namely: $z_6 \leftrightarrow z_8$, $z_1 \leftrightarrow z_7$, $z_7 \leftrightarrow z_8$, $z_2 \leftrightarrow z_3$, $z_2 \leftrightarrow z_6$, $z_1 \leftrightarrow z_8$, $z_3 \leftrightarrow z_5$, $z_3 \leftrightarrow z_6$, $z_2 \leftrightarrow z_4$, $z_6 \leftrightarrow z_7$. We have that in the system of qualitative factors of economic stimulation of top managers' labor the most closely correlated are the factor of effective material rewards (z6), negative factors influencing the bonus system at the enterprise (z8), the acting factor of influence on monetary rewards (z7), and the factor of satisfaction with the existing system of economic stimulation at the enterprise (z3).

Using the mathematicians' proof that Spearman's rank correlation coefficient coincides with the usual Pearson's pair correlation coefficient calculated by ranks [6], multivariate factor analysis, further factor analysis, can be used for the data measured in ordinal scales. This allows us to use factor analysis to unambiguously determine the level of qualitative factors of economic stimulation of the top managers' labor to develop an

integral indicator, taking into account the relationship between them. It is known that in modern mathematical statistics, factor analysis is understood as a set of methods, which, based on the existing relationships of the characteristics of the object, allow us to identify the latent generalizing characteristics. First, there is a set of elementary characteristics of the object x_j , the interaction of which implies the presence of certain causes, that is, the presence of some latent factors. The latter are established as a result of the generalization of elementary attributes and act as integrated characteristics or attributes, but more complex, of a higher level. It should be noted that not only trivial attributes x_j , but also the observed objects N_i can correlate, so the search for latent factors is theoretically possible by both attributes and object data [13]. Since factor analysis makes it possible to compress the initial system of indicators to a smaller number of generalizing attributes, it should be used to develop a qualitative integral indicator of economic stimulation of top managers' labor.

Table 4 presents the definition of the number of significant latent factors to describe the initial system of qualitative signs of economic stimulation of the top managers' labor at the enterprise.

Table 5 shows the factor loadings of qualitative attributes of economic stimulation of the top managers' labor in the enterprise after the turn of VARIMAX, which provides a simpler structure of latent factors.

Table 4. Percentage of variation explained by selected latent factors

Factor number	Own value of the factor	Dispersion value of the factor, %	Value of cumulative, accumulated dispersion, %
1	1,94154	24,269	24,269
2	1,72378	21,547	45,817
3	1,25779	15,722	61,539
4	1,06707	13,338	74,877
5	0,708871	8,861	83,738
6	0,592548	7,407	91,145
7	0,455679	5,696	96,841
8	0,252712	3,159	100,000

Table 5. Factor loadings matrix according to the results of factor analysis after VARIMAX turning

Quality factors	Factor loadings of quality factors by the numbers of the factor analysis factors			
	1	2	3	4
z1	0,103195	0,380857	-0,705263	0,115358
z2	-0,371948	0,314731	0,249266	-0,692426
z3	0,843849	0,00969395	-0,061031	0,175994
z4	-0,424754	0,817567	-0,0758267	-0,0523348
z5	-0,361204	-0,808773	0,162555	-0,102774
z6	0,775735	0,00757224	0,0223377	-0,284176
z7	0,034402	0,0387176	0,831778	0,136634
z8	0,159447	0,28357	0,279033	0,734205

To preserve the condition of comparing the levels of qualitative factors of economic stimulation of top managers' labor in dynamics, it is advisable to calculate the integral indicator according to the data, spatially dynamic with the use of factor loadings (tab. 5). Thus, the first latent factor of economic stimulation of top managers' labor has the form:

$$F_1 = 0,103z_1 - 0,372z_2 + 0,844z_3 - 0,425z_4 - 0,361z_5 + 0,776z_6 + 0,034z_7 + 0,159z_8.$$

This factor explains 24.269% of the dispersion (variability) of the initial system of qualitative factors, which are the largest contribution to the total cumulative dispersion, so it should be used to determine the integral index. Thus, the formula for the integral index (I) looks as follows:

$$I = 0,1031z_1 - 0,3722z_2 + 0,8443z_3 - 0,4254z_4 - 0,3615z_5 + 0,7766z_6 + 0,0347z_7 + 0,1598z_8.$$

By substituting the average values of the qualitative factors, we obtain the level of the integral qualitative indicator. The scale of this integral indicator is also five-point and corresponds to the levels: very low (1 - very weak), low (2 - weak), sufficient (3 - sufficient), high (4 - significant), very high (5 - very strong).

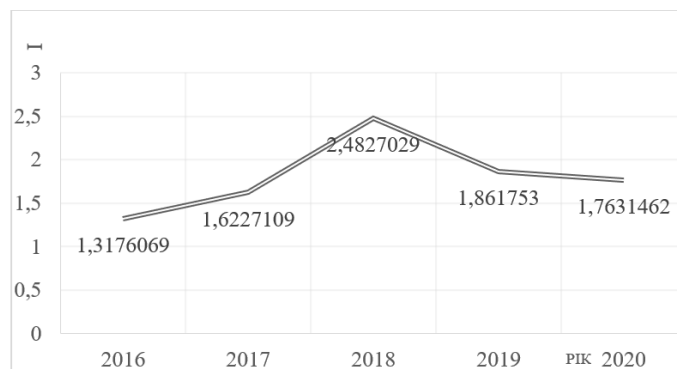


Fig. 2. Dynamics of values of the integral qualitative index of economic stimulation of top managers' labor of the enterprise Private Joint Stock Company "Kharkiv Stamp and Mold Plant"

Consequently, the levels of values of the integral qualitative indicator of economic stimulation of labor of top managers do not exceed the qualitative marks of low (2 - weak), and in the third year - do not exceed sufficient (3 - sufficient). In the last two years, there has been a drop in the level of economic incentives for the work of top managers. This company should urgently develop and disseminate measures to activate the positive effect of the

Besides this factor, there are three more with the following expression:

$$F_2 = 0,381z_1 + 0,315z_2 + 0,01z_3 + 0,818z_4 - 0,809z_5 + 0,008z_6 + 0,039z_7 + 0,284z_8.$$

this factor explains 21.547% of the dispersion of the initial system of quality factors;

$$F_3 = -0,705z_1 + 0,249z_2 - 0,061z_3 - 0,076z_4 + 0,163z_5 + 0,022z_6 + 0,832z_7 + 0,279z_8.$$

this factor explains 15,722% of the dispersion of the initial system of quality factors;

$$F_4 = 0,115z_1 - 0,692z_2 + 0,176z_3 - 0,052z_4 - 0,103z_5 - 0,284z_6 + 0,137z_7 + 0,734z_8.$$

this factor explains 13,338% of the dispersion of the initial system of quality factors.

All four latent factors explain 74.877% of the variability of the values of qualitative factors of economic stimulation of the top managers' labor.

Thus, the dynamics of the integral qualitative indicator of economic stimulation of top managers' labor, calculated using the first latent factor, is presented in fig. 2.

main factors of economic stimulation of top managers' labor.

The given content and the logic of methodological support for determining the level of qualitative economic incentives for top managers' labor were used for the study of 7 enterprises in the Kharkiv region. The dynamics of the qualitative integral index of economic incentives for the work of top managers in 7 enterprises of Kharkiv region is presented in table 6.

Table 6. Integral quality indicator of economic stimulation of the top managers' labor at the enterprises of the Kharkiv region

Name of Company	Year				
	1	2	3	4	5
PJSC "Kharkiv Stamp and Mold Plant"	1,318	1,623	2,483	1,862	1,763
TSPC "NOVA"	1,578	1,490	1,670	0,943	2,125
PSPE "Ukrpolitechservice"	0,769	0,455	1,658	0,075	0,684
PE "Promsintez"	1,601	1,698	0,853	1,478	1,041
PJSC "Machine-Building Plant named after Frunze »	1,942	2,956	2,330	2,438	2,093
Khartron Express LTD Research and Production Enterprise (LLC)	0,443	1,368	0,576	0,291	0,008
PJSC Kharkiv Electrotechnical Plant Ukrelectromash	0,811	0,750	0,079	0,971	1,861

The analysis of the levels of qualitative indicator of economic stimulation of the top managers' labor in the research enterprises of Kharkiv region has proved the presence of low (weak) level of economic stimulation. Special attention should be paid to the influence of the level of remuneration on the increase of economic stimulation of labor, top managers are not satisfied with the existing system of economic stimulation at the enterprise, and they are not satisfied with the level of wages and the main economic stimulating factor of labor used at the enterprises. In addition, the factor of current material rewards is weak, which also does not affect the amount of monetary rewards received for the results of top managers' work.

Thus, the conducted research has proved that in order to develop methodological support for determining the priority qualitative factors of economic stimulation of top managers' labor it is necessary to justify a questionnaire that characterizes and takes into account the main factors of economic stimulation of top managers' labor and their scales, a set of analytical tools for conducting the analysis. factors, namely, tools of descriptive statistics of order attributes, development of an integral qualitative indicator Such basic aspects of

methodological support will allow us to carry out a thorough analysis of qualitative factors of economic stimulation of top managers' labor and determine their level of development at an enterprise in dynamics.

Conclusions

Summarizing, we can conclude that the proposed and substantiated methodological support for determining the priority qualitative factors of economic stimulation of top managers' labor differs from the existing ones: 1) the content of qualitative factors; 2) the analysis of the structure of the studied set of ordering of experts' answers with the help of descriptive statistics tools; 3) the evaluation of the closeness of interrelation of qualitative factors of economic stimulation of top managers' labor in dynamics; 4) the evaluation of consistency of experts' answers in dynamics; 5) identification of latent factors of economic stimulation of top managers' labor; 6) the analytical way of developing the integral qualitative indicator of economic stimulation of top managers' labor.

The main stages, tools and results of the developed methodological support are presented in table 7.

Table 7. The main stages, methods and results of methodological support for the identification of priority quality factors to stimulate the work of top managers at industrial enterprises

Content of the methodological support stage	Calculation methods	Result
Rationale of the questionnaire questions that characterize the main qualitative factors of economic stimulation of top managers' labor and their scales	Theoretical generalization and theoretical-logical analysis	Questionnaire to determine the main qualitative factors of economic incentives for the work of top managers
Analysis of the structure of experts' answers to the questionnaire	Descriptive statistics tools	Structure of the studied set of ordering of experts' answers
Assessment of the relationship between the qualitative factors of economic stimulation of top managers' labor in dynamics	Spearman's rank correlation coefficient	Structure of the relationship between qualitative factors of economic stimulation of top managers' labor in dynamics
Evaluation of the consistency of experts' answers in dynamics	Coefficient of concordance	Structure of consistency of experts' answers in dynamics
Revealing the latent factors of economic stimulation of top managers' labor	Factor analysis	Latent factors of economic incentives for top managers' work
Development of the integral qualitative indicator of economic stimulation of top managers' labor	Factor analysis, mean values of factors, additive convolution method	Integral qualitative indicator of economic stimulation of top managers' labor

The practical significance of the developed methodological support is the scientific substantiation, objective determination of real priority qualitative factors,

which will allow to form reasonable measures for economic stimulation of the top managers' labor at industrial enterprises.

References

- Gamova, O. V. (2010), "Salary as an economic category" ["Zarobitna plata yak ekonomichna kategoriya"], *State and Regions: series: Economics and Entrepreneurship*, No. 3, P. 368.
- Matrosova, O. D., Mykhailik, S.V. (2013), "Moral and material stimulation of labor" ["Moral'ne ta material'ne stimulyuvannya praci"], *Visnyk Nats. tech. HPI University: Coll. Science. etc. Topic. issue : Technical progress and production efficiency*, No. 22 (995), P. 110–113.
- Darchenko, N. D., Gitis, T. P. (2013), *Motivation of personnel [Motivaciya personala]*, textbook, Kramatorsk, DGMA, 139 p.
- Leshchenko, L. O. (2016), "Motivation of labor as a factor in increasing the profitability of production" ["Motivaciya praci yak faktor pidvishchennya pributkovosti virobnictva"], *Effective Economy*, No. 4.
- Saati, T. (1993), *Decision making. Hierarchy analysis method [Motivaciya praci yak faktor pidvishchennya pributkovosti virobnictva]*, Moscow, Radio and communication, 320 p.
- Malyarets, L. M. (2006), *Measurement of signs of objects in the economy: methodology and practice [Vimiryuvannya oznak ob'ektiv v ekonomici: metodologiya ta praktika]*, Kharkiv, KhNEU, 384 p.
- Yeliseyeva, O. K., Kutova, N. G. (2017), "Stimulation in the personnel management system of enterprises" ["Stimulyuvannya v sistemi upravlinnya personalom pidpriemstv"], *Business Inform*, No. 4, P. 388–392.

8. Kondratenko, N. O., Volkova, M. V., Mahomedova, M. A. (2019), "Foreign Experience of Using the Organization's Motivation and Incentive System", *Business Inform.* No. 12, P. 414–420. DOI: <https://doi.org/10.32983/2222-4459-2019-12-414-420>
9. Lukanenko, D., Mozgovyi, O., Burmaka, M. (2015), "Motivation of top management of global corporations" ["Motivaciya top-menedzhmentu global'nih korporacij"], *International economic policy*, No. 2 (23), P. 5–28.
10. Grigorieva, L. (2011), "Development of views on the role and value of top managers" ["Rozvitok poglyadiv na rol' ta cinnist' top-menedzheriv"], *Socio-economic problems and the state*, Issue. 2 (5).
11. Klymchuk, A. O., Mikhailov, A. N. (2018), "The motivation and stimulation of personnel in effective enterprise management and innovation activity improving", *Marketing and Management of Innovations*, No.1, P. 218–234. DOI: <http://doi.org/10.21272/mmi.2018.1-16>.
12. Karpenko, V. L. (2011), "Directions of stimulation of top management on assistance to achievement of competitive advantages of the enterprise in the market" ["Napryami stimulyuvannya top-menedzhmentu shchodo spriyannya dosyagnennyu konkurentnih perevag pidpriemstva na rynku"], *Bulletin of Khmelnytsky National University. Ser. : Economic Sciences*, No. 2, Vol. 1, P. 29–34.
13. Ponomarenko, V. S., Malyarets, L. M. (2009), *Data analysis in studies of socio-economic systems*, monograph, "INZHEK", 432 p.
14. Johan Graafland & Niels Noorderhaven (2020), "Technological Competition, Innovation Motive and Corporate Social Responsibility: Evidence from Top Managers of European SMEs," *De Economist*, Vol. 168 (1), P. 1–22. DOI: <https://doi.org/10.1007/s10645-019-09351-z>
15. Muhammad, Fiaz & Qin Su & Ikram Amir & Aruba Saqib (2017), "Leadership styles and employees' motivation: Perspective from an emerging economy," *Journal of Developing Areas*, Vol. 51 (4), P. 143–156.
16. Philip, T., Roundy & Ye Dai & Mark A., Bayer & Gukdo Byun (2016), "Motivated to change? TMT regulatory focus and strategic change," *Management Research Review*, Vol. 39 (7), P. 803–829.
17. Momot, T., Filonych, O., Kosiak, A. Lobach, O. (2021), "Balanced scorecard of safety-oriented management for the construction industry enterprises", *Innovative technologies and scientific solutions for industries*, No. 2, P. 54 – 62. DOI: <https://doi.org/10.30837/ITSSI.2021.16.054>

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ВИЗНАЧЕННЯ ПРІОРИТЕТНИХ ЯКІСНИХ ФАКТОРІВ СТИМУЛЮВАННЯ ПРАЦІ ТОП-МЕНЕДЖЕРІВ ПІДПРИЄМСТВ

Стаття присвячена обґрунтуванню основних суб'єктивних якісних факторів, які є типовими для стимулювання праці менеджерів стратегічного рівня управління підприємств, і які доцільно враховувати в процесі розроблення системи економічного стимулювання їх діяльності, оскільки базування і визначення обсягів заохочень тільки на статистичній об'єктивній інформації не в змозі суттєво впливати на кінцеві результати діяльності праці топ-менеджерів. **Метою** статті є виявлення пріоритетних якісних факторів впливу на процес економічного стимулювання діяльності топ-менеджерів промислових підприємств та їх кількісна інтерпретація на основі об'єднання якісних оцінок в інтегральний показник. **Завданнями** статті є аналізування результатів анкетування топ-менеджерів щодо окремих якісних факторів впливу на їх умотивованість, визначення статистичного зв'язку між факторами, визначення явних і латентних тенденцій динаміки цих факторів, розрахування інтегрального показника впливу виявлених значущих факторів, формування методичного забезпечення виявлення пріоритетних якісних факторів економічного стимулювання результатів роботи топ-менеджерів промислових підприємств. **Об'єктом** статті є процес економічного стимулювання результатів діяльності топ-менеджерів промислових підприємств. **Предметом** статті є теоретичні положення, методичне забезпечення, практичні пропозиції щодо

економічного стимулювання діяльності менеджерів стратегічного рівня управління промислових підприємств. **Методи.** Для досягнення мети у статті використані такі основні загальні та спеціальні методи дослідження: теоретичне узагальнення, анкетування, інструменти описової статистики, ранговий коефіцієнт кореляції Спірмена, багатовимірний факторний аналіз, метод розрахунку інтегрального показника якісних факторів стимулювання праці менеджерів, графічний метод. **Результати.** В якості результатів дослідження: проаналізовано наукові досягнення попередників щодо формування і використання показників результатів діяльності підприємств як індикаторів стимулювання праці топ-менеджерів; опитувано топ-менеджерів промислових підприємств щодо їх думок про основні фактори впливу на результативність власної діяльності; доведено взаємозв'язок факторів впливу на стимулювання праці топ-менеджерів, що представлені в анкеті; виявлено явні та латентні тенденції взаємозв'язку факторів впливу на результативність праці менеджерів стратегічного рівня підприємств; визначено інтегральний показник якісних факторів стимулювання праці менеджерів, кількісні значення якого довели наявність недостатнього врахування факторів на процес стимулювання. **Висновки.** В результаті визначення взаємозв'язку між якісними факторами впливу на економічне стимулювання праці топ-менеджерів розроблено методичне забезпечення, що відрізняється: змістом якісних факторів; аналізом структури досліджуваної сукупності упорядкувань відповідей експертів за допомогою інструментів описової статистики; оцінкою тісноти взаємозв'язку якісних факторів економічного стимулювання праці топ-менеджерів в динаміці; оцінкою узгодженості відповідей експертів в динаміці; виявленням латентних факторів економічного стимулювання праці топ-менеджерів; аналітичним методом розроблення інтегрального якісного показника економічного стимулювання праці топ-менеджерів.

Ключові слова: стимулювання праці; топ-менеджер; промислове підприємство; якісні фактори; взаємозв'язок між якісними факторами; методичне забезпечення.

ОПРЕДЕЛЕНИЕ ПРИОРИТЕТНЫХ КАЧЕСТВЕННЫХ ФАКТОРОВ СТИМУЛИРОВАНИЯ ТРУДА ТОП-МЕНЕДЖЕРОВ ПРЕДПРИЯТИЙ

Статья посвящена обоснованию основных субъективных качественных факторов, типичных для стимулирования труда менеджеров стратегического уровня управления предприятий, и которые целесообразно учитывать в процессе разработки системы экономического стимулирования их деятельности, поскольку базирование и определение объемов поощрений только на статистической объективной информации не способно оказывать существенное влияние на конечные результаты деятельности труда топ-менеджеров. **Целью** статьи является выявление приоритетных качественных факторов влияния на процесс экономического стимулирования деятельности топ-менеджеров промышленных предприятий и их количественная интерпретация на основе объединения качественных оценок в интегральный показатель. **Задачами** статьи являются анализ результатов анкетирования топ-менеджеров относительно отдельных качественных факторов влияния на их мотивированность, определение статистической связи между факторами, определение явных и латентных тенденций динамики этих факторов, расчет интегрального показателя влияния выявленных значимых факторов, формирование методического обеспечения выявления приоритетных качественных факторов экономического стимулирования результатов работы топ-менеджеров промышленных предприятий. **Объектом** статьи является процесс экономического стимулирования результатов деятельности топ-менеджеров промышленных предприятий. **Предметом** статьи являются теоретические положения, методическое обеспечение, практические предложения по экономическому стимулированию деятельности менеджеров стратегического уровня управления промышленных предприятий. **Методы.** Для достижения цели в статье использованы следующие основные общие и специальные методы исследования: теоретическое обобщение, анкетирование, инструменты описательной статистики, ранговый коэффициент корреляции Спирмена, многомерный факторный анализ, метод расчета интегрального показателя качественных факторов стимулирования труда менеджеров, графический метод. **Результаты.** В качестве результатов исследования: проанализированы научные достижения предшественников по формированию и использованию показателей результатов деятельности предприятий как индикаторов стимулирования труда топ-менеджеров; опрошены топ-менеджеры промышленных предприятий для выявления их мнений об основных факторах влияния на результативность своей деятельности; доказана взаимосвязь факторов влияния на стимулирование труда топ-менеджеров; выявлены явные и латентные тенденции взаимосвязи факторов влияния на результативность труда менеджеров стратегического уровня предприятий; определен интегральный показатель качественных факторов стимулирования труда менеджеров, количественные значения которого доказали наличие недостаточного учета факторов на процесс стимулирования. **Выводы.** В результате определения взаимосвязи между качественными факторами влияния на экономическое стимулирование труда топ-менеджеров разработано методическое обеспечение, отличающееся: содержанием качественных факторов; анализом структуры изученной совокупности упорядоченных ответов экспертов с помощью инструментов описательной статистики; оценкой тесноты взаимосвязи качественных факторов экономического стимулирования труда топ-менеджеров в динамике; оценкой согласованности ответов экспертов в динамике; выявлением латентных факторов экономического стимулирования труда топ-менеджеров; аналитическим способом разработки интегрального качественного показателя экономического стимулирования труда топ-менеджеров.

Ключевые слова: стимулирование труда; топ-менеджер; промышленное предприятие; качественные факторы; взаимосвязь между качественными факторами; методическое обеспечение.

Бібліографічні опису / Bibliographic descriptions

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