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JUSTIFICATION OF VULNERABILITY OF ENTERPRISES WITH WEAK DYNAMICS IN THE CRISIS PERIOD

The article substantiated the necessity and relevance of the development of strategies of production organisation in the crisis period for enterprises with weak dynamics, and also noted the main features of such enterprises, due to which they are vulnerable in the crisis period even if the quality of management is close to optimal, because of the peculiarities associated with the main type of production activity. However, the set task of analysing the problems of production organisation at the enterprises with poor dynamics and substantiating the problems of production organisation at the enterprises with poor dynamics with weak dynamics and justification of their vulnerability in the crisis period due to the peculiarities of production was solved only in terms of qualitative analysis of the crisis impact. crisis impact. For a more detailed study of the mechanism of such influence in order to reduce its consequences for the work of the enterprise with poor dynamics. in order to reduce its consequences for the operation of an enterprise with weak dynamics it is necessary to quantitatively assess the degree of its non-dynamism. In this case it is necessary to analyse more deeply the main signs for the formation of a quantitative parameter for each of them. quantitative parameter for each of them. And then, taking into account the weight of each parameter to form an integral indicator of non-dynamism of enterprises, according to which different enterprises can be compared with each other, making a ranked list of them. their ranked list. It should be borne in mind that different activities of an enterprise will have different indices of non-dynamicity. Therefore, it is necessary to weigh each type of its activity in the integral indicator of the non-dynamicity of the enterprise, distinguishing between the indicator of non-dynamicity of a separate type and the integral indicator of non-dynamicity of the whole enterprise, which is a numerical assessment of all types of activities of the enterprise, taking into account its organisational and economic structure. Thus, this article presents the development of an integral indicator of non-dynamism of the enterprise as a quantitative assessment that allows us to analyse the vulnerability of the enterprise in the crisis period due to its weak dynamics. It is for such enterprises that the developed strategies of production organisation during the crisis period can significantly increase its crisis resistance without significant improvement in the quality of enterprise management.

Keywords: crisis period, enterprise, vulnerability, quantitative assessment, qualitative indicators.

JEL classification: H12, L30

Formulation of the problem. A crisis of any nature is a process that takes place over time. The subject of analysis in this paper is the main managerial problems that arise at different stages of this process and ways to resolve them. Post-crisis analysis is the main means of identifying the causes of crisis situations and assessing the effectiveness of management decisions. The peculiarities of the work of different types of commissions conducting such analyses are discussed. It is suggested to use the synchronistic table and its modifications as a tool for implementing a scientific approach in studying the crisis process. Anti-crisis managerial culture is the basis that allows to develop managerial actions aimed at containing the crisis and reducing its negative consequences, and in some cases to use the crisis as a springboard for further development. The main means of forming anti-crisis managerial culture is the training of highly qualified personnel for crisis management. crisis management.

Analysis of recent achievements and publications. Many scientific works of foreign and domestic scientists are devoted to the study of the problems of enterprise

management in the crisis period. For example, the impact of vulnerability on the development of enterprises was studied in [1]. The theoretical aspects of system modelling of the development of enterprises with weak dynamics are covered in [2; 3]. Considerable attention is paid to the analysis of internal factors of enterprise development in [6]. However, scientific, methodological and methodological developments on the substantiation of the vulnerability of enterprises with weak dynamics in the crisis period are still insufficient.

The solution of the **tasks** set in the abstract guarantees achievement of the **goal** formulated in the article. Since the development of an optimal strategy will reduce the non-dynamism of the enterprise as a whole while maintaining the main production with weak dynamics, which will increase its crisis resistance.

Presentation of the main material. Economic crisis (from Greek krisis – turning point) is considered to be a sharp deterioration of the economic situation, manifested in a significant decline in production, disruption of established production relations, bankruptcy of enterprises,

rising unemployment and, as a result, a decline in living standards and welfare of the population. This, in turn, leads to a decrease in purchasing power and a fall in demand for most goods and services. This is especially true for non-essential items. Enterprises must respond to the decline in demand by reducing supply, which in a sufficiently prolonged crisis can only be ensured by reducing the volume of production.

Thus, based on the experience of industrial enterprises, it is possible to justify the vulnerability of enterprises with weak dynamics in the crisis period by the following provisions.

A long production cycle creates prerequisites for a number of participants to withdraw from commercial projects, thus jeopardising the implementation of such projects. In the case of serial production of products with a long production cycle, the customer may refuse contracts concluded before the crisis or significantly reduce its order portfolio.

Partial utilisation or downtime of production equipment in some cases is not possible at all or contributes to premature wear and tear and failure. As a rule, restoring its working capacity requires substantial costs and reorganisation of the production process itself, which is practically unfeasible in a crisis.

Intellectual capital of the enterprise with weak dynamics provides its competitiveness in the market. The fall in demand for products and, as a consequence, the possible loss of highly qualified personnel can cause a situation in which part of intellectual capital will be irretrievably lost. In a crisis, such a loss may be irreplaceable and lead to a significant reduction in the competitiveness of the enterprise.

The task of finding the weak link in the enterprise production organisation system is set wider than in this paper and is a complex actual task of crisis recovery. The paper [8] describes five steps of solving this problem for the successful overcoming of the crisis by the enterprise [6]:

- Finding the limitation of the production organisation system. Identification of the system element containing the weakest link. Finding out its nature: physical (production process) or organisational (production process management).

- Weakening the influence of the system constraint as much as possible. Identifying opportunities to maximise the use of the constraint element without significant additional costs, thus weakening the negative impact of the constraint on the system as a whole. the negative impact of the constraint on the operation of the system as a whole.

- Focusing maximum effort on the system limiter. Once the constraint has been identified (step 1) and decided upon (step 2), the entire system must be adjusted so that the constraint operates at maximum efficiency. This may require slowing down some parts of the system and speeding up others. Next, the results of the performed actions should be analysed in terms of how much the constraint delays the operation of the whole system after the performed set of actions.

If the impact of the constraint is still significant, then proceed to step 4. If it is practically levelled out, proceed to step 5.

- Removing the restriction. If steps 2 and 3 are not enough to remove the restriction, more radical solutions are required. This step may require certain investments of time, effort, funds and other resources. All opportunities within the first three steps must be utilised. Removing the constraint implies that the full range of possible measures will be used to remove the constraint. of possible measures will be used to remove the constraint and, eventually, the constraint will be removed.

- Return to the first step to find a new constraint. If the constraint is removed in steps 3 or 4, you must go back to step 1 and start the cycle over again.

A new element should be identified that maximises the constraint on the system. For enterprises with weak dynamics, the most significant constraint, as a rule, is weakly dynamic production. In crisis conditions, it will significantly increase the turnover time of working capital due to the crisis decrease in demand and the impossibility to reduce production volumes as quickly due to weak dynamics. However, the removal of this limitation is much more complicated than presented in the above-mentioned five-step scheme [9]. The present article is devoted to the search and development of a strategy for organising production at an enterprise with weak dynamics in the crisis period, which ensures the implementation of step 2 of the scheme.

There are various ways to improve the crisis resilience of enterprises with weak dynamics during the crisis.

The most common of them is to improve the quality of enterprise management by selecting highly qualified managers who have a long positive experience of such work. extensive positive experience of such work. However, weak dynamics as a specific property of the enterprise opens up the possibility of using another resource, the efficiency of which in some cases may be higher, than the managerial one. It goes without saying that the quality of management is still an important factor, but it is moving to the background. Of primary importance of paramount importance is changing the structure of production organisation in such a way in such a way that the weak dynamics of the main production is levelled. It is by eliminating the negative impact of the weak dynamics of the main production by means of its reorganisation, it is possible to obtain additional crisis-resistant reorganisation, it is possible to obtain additional crisis resistance. of the enterprise as a whole. In order to search for and justify the reserve of increasing crisis resistance in the above aspect, the paper sets the task of analysing the problems of production organisation at enterprises with weak dynamics. Problems of production organisation at enterprises with weak dynamics justification of their vulnerability in the crisis period due to the peculiarities of the production.

To identify the degree of vulnerability of the enterprise due to weak dynamics and to carry out a quantitative analysis of the increase of crisis resistance of the enterprise by levelling of weak dynamics it is necessary, taking into account the main features of the enterprise with weak dynamics, to develop an integral indicator of non-dynamic nature of production and the enterprise as a whole. The solution of this problem will allow to rank the enterprises according to their vulnerability in the crisis period and to determine the level of measures used in the

strategy of production organisation in the crisis period and aimed at reducing the non-dynamism of the enterprise as a whole. The work considers measures of three levels:

- enterprise level;
- regional level;
- state level.

Higher values of the integral index of non-dynamicity require the development of measures of a higher level, provided that the resource of reducing non-dynamicity is exhausted by means of measures of a lower level.

The integral indicator of non-dynamicity developed in solving the second problem is a characteristic of the enterprise, but not of crisis dynamics. Depending on the parameters of the crisis, significant losses will be incurred by enterprises with different values of the integral indicator of non-dynamism. Therefore, the next task of the thesis work is development of a fuzzy criterion of non-dynamicity to assess the vulnerability of the of the enterprise due to weak production dynamics. In contrast to integral indicator of non-dynamicity, the criterion of non-dynamicity must have fuzzy boundaries not only because of approximate estimation of the model parameters. parameters of the model. The crisis impact itself as a link between two processes – production and crisis dynamics – is not only due to the approximate estimation of the model parameters. production and crisis dynamics – is a much more complex object than the estimation of crisis parameters or model parameters. object than the estimation of the crisis parameters or the degree of non-dynamism of the enterprise. enterprise. That is why in this paper as a criterion of non-dynamism is a fuzzy set. is a fuzzy set.

This mathematical tool has been chosen not by chance. Because only in fuzzy logic it is possible for one and the same element (for example, a certain value of the integral index of non-dynamicity) to belong to two opposite fuzzy sets (for example, enterprises that survive the crisis and those that go bankrupt as a result of the crisis). The reason for this fuzziness, in our opinion, is not so much in the influence of the quality of management or assumptions in mathematical modelling and errors in parameter estimates, but in the complexity of mathematical formalisation of the crisis impact on the enterprise. In fact, within the framework of this paper, vagueness is treated as a specific property of the crisis impact process itself. To form the strategy of production organisation taking into account vagueness the criterion of non-dynamicity, the task of creating an expert system for development of the methodology of production organisation in the crisis period. The solution of this task will allow, by using the known algorithms of defuzzification to get a clear conclusion in the form of the

optimal for the given enterprise and the given crisis strategy of production organisation. crisis strategy of production organisation.

In this case, it should be borne in mind due to the presence of vagueness, the use of different defuzzification algorithms may lead to different strategies. defuzzification algorithms may lead to different strategies. However, this is entirely corresponds to reality, since it is difficult to imagine the existence of a single way to reduce the non-dynamic nature of an enterprise by reorganising production activities. In fact, there are many such ways. If within the framework of one model the optimality of one of the ways is revealed. of one of the ways, then taking into account the essential stochasticity of the problem to be solved, it is unlikely that anyone would insist on the optimality of this path in the broad sense. in the broad sense. Since insignificant changes in the initial conditions, parameters of the crisis or mathematical formalisation of the impact of the crisis can lead to a different strategy being optimal. Therefore, it is hardly can be considered a disadvantage of the proposed in this paper approach with the use of fuzzy logic the dependence of a clear strategy on the choice of the algorithm of defuzzification.

Conclusions. Enterprises with weak dynamics are more vulnerable during the crisis period due to the peculiarities of the organisation of production activities and the production process itself. In addition to the traditional and well-studied ways of dealing with crisis dynamics, such as improving the quality of management or direct subsidy support, it is therefore necessary to look for other ways of dealing with crisis dynamics, while at the same time looking deeper into and investigating the specific features that cause the lack of dynamism in production. Reducing non-dynamicity of individual production units and the enterprise as a whole can not only become a way to reduce the consequences of crisis dynamics for the enterprise, but also open wide opportunities for technical and technological re-equipment of the enterprise using the most advanced experience, such as lean production, etc. Correct ranking of enterprises according to the degree of their non-dynamism will allow to develop more competently and targeted measures for their anti-crisis support at the state, regional and enterprise levels, as well as the strategy of production organisation. enterprise level, as well as the strategy of production organisation. At the same time, the efficiency of the support itself will increase efficiency of the support itself will increase due to the quantitative assessment of both the current degree of non-dynamism and the available degree of non-dynamicity, as well as the reserves available to the enterprise to reduce it. reduction.

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ОБҐРУНТУВАННЯ ВРАЗЛИВОСТІ ПІДПРИЄМСТВ ЗІ СЛАБКОЮ ДИНАМІКОЮ В КРИЗОВИЙ ПЕРІОД

У статті було обґрунтовано необхідність та актуальність розроблення стратегій організації виробництва в кризовий період для підприємств зі слабкою динамікою, а також наголошено на основних ознаках таких підприємств, завдяки яким вони є вразливими в кризовий період навіть за близької до оптимальної якості менеджменту через особливості, пов'язані з основним видом виробничої діяльності. Однак поставлене завдання аналізу проблем організації виробництва на підприємствах зі слабкою динамікою та обґрунтування їхньої вразливості в кризовий період через особливості виробництва було вирішено лише в частині якісного аналізу кризового впливу. Для детальнішого вивчення механізму такого впливу з метою зниження його наслідків для роботи підприємства зі слабкою динамікою необхідна кількісна оцінка ступеня його нединамічності. При цьому слід більш глибоко проаналізувати основні ознаки для формування кількісного параметра за кожною з них. А потім з урахуванням ваги кожного параметра сформувати інтегральний показник нединамічності підприємств, за яким різні підприємства можна порівнювати між собою, складаючи їхній ранжирований список. Підприємства зі слабкою динамікою є більш уразливими в кризовий період завдяки особливостям організації виробничої діяльності та самого виробничого процесу. Це зумовлює, крім традиційних і добре вивчених способів протистояння кризовій динаміці, таких як підвищення якості менеджменту або прямої фінансової підтримки, шукати й інші способи, водночас глибше заглиблюючись і досліджуючи ті особливості, внаслідок яких проявляється нединамічність виробництва. Слід враховувати, що різні види діяльності підприємства матимуть різні показники нединамічності. Тому в інтегральному показнику нединамічності підприємства необхідно зважити кожен вид його діяльності, розрізняючи при цьому показник нединамічності окремого виду та інтегральний показник нединамічності всього підприємства, що є числовою оцінкою всіх видів діяльності підприємства з урахуванням його організаційно-економічної структури. Таким чином, у цій статті представлено розроблення інтегрального показника нединамічності підприємства як кількісної оцінки, що дає змогу проводити аналіз уразливості підприємства в кризовий період через його слабку динаміку. Саме для таких підприємств розроблені стратегії організації виробництва в період кризи можуть істотно підвищити його кризостійкість без істотного поліпшення якості управління підприємством.

Ключові слова: кризовий період, підприємство, вразливість, кількісна оцінка, якісні показники.