УДК 338.931
DOI: https://doi.org/10.32782/2786-8141/2023-5-25

Denys Fomenko
Postgraduate,
Volodymyr Dahl East Ukrainian National University
ORCID: https://orcid.org/0009-0001-2980-450X

Andrii Dimchohlo
Postgraduate,
Volodymyr Dahl East Ukrainian National University

Volodymyr Pimenov
Postgraduate,
Volodymyr Dahl East Ukrainian National University

Фоменко Д.В., Дімчогло А.І., Піменов В.С.
Східноукраїнський національний університет імені Володимира Даля

ANALYSIS OF PROBLEMS OF ECONOMIC STABILITY OF ENTERPRISES WITH WEAK DYNAMICS IN THE CRISIS PERIOD

АНАЛІЗ ПРОБЛЕМ ЕКОНОМІЧНОЇ СТІЙКОСТІ ПІДПРИЄМСТВ ЗІ СЛАБКОЮ ДИНАМІКОЮ У КРИЗОВИЙ ПЕРІОД

Abstract. *This article presents a series of studies that allow us to draw a number of conclusions regarding the measurable indicator of enterprise sluggishness. The sluggishness of an enterprise as a whole is characterized by the sluggishness indicators of individual productions that it implements within the framework of its activities. In this case, the analysis of individual types of production activities allows not only to ultimately form an integral indicator of enterprise sluggishness, but also to rank types of production activities by the degree of their sluggishness. This opens up opportunities for developing a set of measures to reduce sluggishness at the enterprise level by organizing production processes within the enterprise in such a way that the integral indicator of enterprise sluggishness would have a minimal value. Evaluation of integral indicators of enterprise sluggishness allows us to predict the degree of vulnerability of enterprises with weak dynamics during a crisis period, provided that information on the main parameters of the crisis is available. For this purpose, we apply the apparatus of fuzzy logic, which allows us to obtain the result of assessing the crisis resistance of enterprises in the form of a fuzzy set. In this case, the assessment of the integral indicator of sluggishness can be carried out only taking into account the real factors influencing sluggishness, and then – with additional consideration of potential factors reducing sluggishness, which will gain weight when implementing a set of measures to reduce sluggishness at the enterprise level. Formation of a ranked list of enterprises with weak dynamics in the form of a fuzzy linguistic variable allows us to further construct a mathematical model for assessing the crisis resistance of enterprises using the apparatus of fuzzy logic, excluding a separate consideration of the stochasticity of the problem being solved and an assessment of the accuracy of calculating the integral indicator of sluggishness and the main parameters of the crisis. In this case, it is more correct to consider enterprises within the framework of their classification by the level of specialization, dividing the ranked list of enterprises into three categories. Since specialized enterprises, due to the limited types of production activities, will face more serious difficulties in developing a set of measures to reduce sluggishness. The range of possible instruments in the case of specialized enterprises is very limited, so they often resort to direct subsidized support for such enterprises.*

Keywords: *economic stability, dynamics of development, crisis period, indicators, risks.*

Анотація. *У статті проведено низку досліджень, які дозволяють зробити низку висновків щодо вимірного показника нединамічності підприємства. Нединамічність підприємства загалом характеризується показниками нединамічності окремих виробництв, що його реалізує у межах своєї діяльності. І тут аналіз окремих видів виробничої діяльності дозволяє як сформувати зрештою інтегральний показник нединамічності підприємства, а й ранжувати види виробничої діяльності за рівнем їх нединамічності. Це відкриває можливості для розробки комплексу заходів щодо зниження нединамічності на рівні підприємства за рахунок такої організації виробничих процесів усередині підприємства, за якої інтегральний показник нединамічності підприємства мав би мінімальне значення. Оцінка інтегральних показників нединамічності підприємств дозволяє прогнозувати ступінь уразливості підприємств із слабкою динамікою у кризовий період за умови наявності інформації про основні параметри кризи. Для цієї мети застосуємо апарат нечіткої логіки, що дозволяє отримати результат оцінки кризостійкості підприємств у вигляді нечіткої множини. При цьому сама оцінка інтегрального показника нединамічності може бути проведена тільки з урахуванням реальних факторів, що впливають на нединамічність, а потім – з додатковим врахуванням потенційних факторів, що знижують нединамічність, які набудуть своєї ваги при реалізації комплексу заходів щодо зниження нединамічності на рівні підприємства. Формування ранжованого списку підприємств зі слабкою динамікою у вигляді нечіткої лінгвістичної змінної дозволяє побудувати надалі математичну модель оцінки кризостійкості підприємств за допомогою апарату нечіткої логіки, виключаючи окремий розгляд стохастичності розв'язуваного завдання та оцінку точності обчислень інтегрального показника. При цьому коректніше розглядати підприємства в рамках їхньої класифікації за рівнем спеціалізації, поділяючи ранжований список підприємств на три категорії. Оскільки спеціалізовані підприємства через обмеженість видів виробничої діяльності зіткнуться з серйознішими труднощами розробки комплексу заходів щодо зниження нединамічності. Спектр можливих інструментів у разі спеціалізованих підприємств є дуже обмеженим, тому часто вдаються до прямої дотаційної підтримки таких підприємств.*

Ключові слова: *економічна стійкість, динаміка розвитку, кризовий період, показники, ризики.*

Formulation of the problem. The estimated integral indicator of the company's lack of dynamism should be correlated with the main parameters of the impending crisis to determine the degree of reorganization of the enterprise's production process, the final result of which should be a reduction of lack of dynamism to such a level that will allow the company to successfully overcome the crisis, preserving key production and personnel potential. To achieve this goal, it is necessary to form a criterion for the non-dynamism of the enterprise, which would determine the critical value of the non-dynamic indicator, above which the enterprise will almost inevitably suffer irreparable significant losses in a crisis or even cease its activities due to a high degree of non-dynamism. At the same time, as already noted above, the quality of management decisions in this paper is not analyzed and is considered close to optimal.

Analysis of recent achievements and publications. Research on theoretical and practical aspects of risk management at the enterprise is significant and includes scientific works of well-known Ukrainian and foreign scientists, including: V. Apopiy, A. Algina, I. Balabanova, G. Bashnyanin, O. Bila, I. Blank, V. Granaturov, G. Velykoivanenko, E. Velychko, V. Vitlinsky, L. Donets, V. Zagorsky, S. Ilyashenko, V. Cherkasova, O. Ustenko, E. Utkina, A. Mazaraki, N. Mashina, B. Mizyuk, S. Nakonechnyi, G. Kleiner, V. Tochylin, M. Khokhlova, K. Hladen, A. Shtefanych, O. Yastremska and others, whose works are devoted to the study of certain aspects of the essence of risks, their analysis, identification of factors and causes of its occurrence and management. However, the issue of the impact of innovation on the economic sustainability of an industrial enterprise is still open.

Therefore, the **purpose** of the article is to analyze the problems of economic stability of enterprises with weak dynamics during a crisis period and to propose measures to improve the situation.

Presentation of the main material. The problem of risks of investments in production is very topical even outside the crisis period. A sufficient number of studies are devoted to it. However, without considering it separately in the context of the problem, it should be noted that the authors of many works emphasize the long production cycle as a source of serious risks. Thus, [1] notes the need to assess the effectiveness of capital investments in the technical re-equipment of enterprises of different profiles with long technological cycles. Only in the case of a correct comparison of investments, working capital, profit, consumption fund on time intervals it is possible to count on the economic effect of this production activity with a competent justification of the criteria of proportional distribution of funds [6]. Obviously, the crisis complicates this task many times. In [2] this risk is singled out in a separate category – the risk of non-realization of funds [6]. A separate category – the risk of non-realization of the produced goods, – one of the reasons for which is indicated as a decrease in demand, and one of the one of the causes of which is indicated as a decrease in demand, and the long production cycle exacerbates the consequences of negative consequences of the crisis. cycle aggravates the consequences of the negative scenario.

Thus, it can be argued that the presence of a long production cycle at the onset of crisis dynamics contributes to the following a significant increase in the risk of non-realization of manufactured products, as well as, to a lesser extent (depending on the parameters of the crisis) – the risk of technical and technological lag of the enterprise.

Inefficiency of regular operation of production equipment at its partial utilization or periodic downtime. A broad view of this topical problem raises not only the issues of lean production, which were touched upon earlier. The efficiency of fixed assets utilization is the most important indicator of enterprise competitiveness. In particular, if we talk only about production equipment, in the world practice there is an OEE (Overall Equipment Effectiveness) indicator used to measure the overall efficiency of equipment [1]. It takes into account three types of losses:

– due to equipment downtime;
– due to the reduction of production speed;
– related to poor product quality.

Each species is scored with its own indicator, ranging from 0 to 1. The three scores are then multiplied together to form the OEE score. In international practice, an OEE score of less than 65 per cent is considered poor, between 65 per cent and 75 per cent satisfactory, and more than 65 per cent good. Less than 65%, satisfactory – from 65% to 75%, good – more than 75%. (world industrial leaders have values of 80-85%) [135]. This applies to every enterprise in any period of its activity. Undoubtedly, the decrease in demand for products, caused by crisis dynamics, aggravates the problem of the effective utilization of production equipment for any enterprise. Effective utilization of production equipment for any enterprise. However, enterprises with weak dynamics react particularly painfully to the decrease in the efficiency of production equipment utilization. React especially painfully to the decrease in the efficiency of production equipment utilization equipment due to the peculiarities of the production process for a number of reasons, independent of the quality of their management. The main such reasons should be include:

– risks of equipment failure and emergencies (for example, in the nuclear power industry, when operating nuclear reactors, there are limits on the minimum electrical power generated [6], below which the reaction becomes uncontrollable);

– significant losses up to the impossibility to continue the activity without new investments (for example, stoppage of the equipment for the production of fodder for a livestock enterprise will lead to the loss of livestock and impossibility to continue livestock breeding activities);

– the possibility of realizing the production process within a limited

– time (for example, the space industry, including space production, is characterized by a limited period of active existence of a spacecraft [3]).

It was noted earlier that there are other reasons not related to the organization and peculiarities of the production process itself.

Organization and peculiarities of the production process itself, for example, a long sales cycle of finished products, which are not considered within the framework of this article.

Thus, it can be argued that for some enterprises with weak dynamics, partial utilization of production equipment is not just inefficient, but in some cases even impossible. This significantly affects the search for effective strategies of production organization in the crisis period, making

a significant reduction in production volumes out of the category of possible and acceptable solutions.

High level of intellectual capital. Even during the perestroika period, the following were indicated as the main directions of industrial enterprise reform [2]:

– inclusion of innovative divisions in the structure of enterprises;

– strengthening of enterprise ties with research, development and design organizations;

– priority use in the innovation process at enterprises of domestic, including their own, technological developments and domestic equipment instead of purchasing foreign equipment.

Since only in this case it is possible to fully develop and create new competitive products that meet all modern requirements. An alternative to this is the purchase of ready-made developments and the organization of the production process under licenses from leading global manufacturers. Such an alternative is certainly associated with technical and technological backwardness, as well as high risks.

Therefore, increasing the intellectual capital of an enterprise is currently one of the few full-fledged ways of enterprise development, taking into account the rapid development of technical progress and technology. This is confirmed by the interpretations of the very concept of intellectual capital. Thus, E. Brooking believes that "Intellectual capital is a term for intangible assets without which a company can no longer exist" [7].

Unlike abstract knowledge, knowledge about a company and the intellectual capital of an organization have a clearly expressed monetary value, calculated as the difference between the market value of the company (the number of shares multiplied by their stock exchange price) and its book value (the sum of all the company's assets, including fixed and current assets). For most American companies, especially high-tech ones, whose shares are listed on the NASDAQ stock exchange, the value of intellectual capital is many times greater than the book value. This suggests that the knowledge accumulated by these companies is valued by the market at a much higher price than all the property owned by these companies" [8]. The onset of a crisis period has an extremely negative impact on both the implementation of new innovative projects of the enterprise, postponing these projects indefinitely and not bringing some of them to implementation at all (which has already been said earlier), and on the financial support of the most highly qualified employees, thanks to whom the enterprise has a high level of intellectual capital. The departure of such employees from the enterprise creates a serious problem for it, sometimes significantly reducing the competitiveness of the enterprise. The training of new personnel requires significant time and investment. Thus, it can be argued that the task of maintaining a high level of intellectual capital of an enterprise, without which its activity, as a rule, is simply impossible, significantly limits possible strategies for crisis organization of production.

For multi-industry enterprises, each individual production has its own degree of non-dynamism. Therefore, the formation of the integral indicator of non-dynamism in this case should begin with individual productions. It should be noted that the presence of a significant gradient of non-dynamism indicators of individual productions within one enterprise can become a key moment for developing measures to reduce the integral indicator of non-dynamism of the enterprise.

For a more detailed analysis, it is possible to take into account the types of production. As is known, there are three types of production: single, serial and mass. Single production is usually unique. Therefore, it is more vulnerable. Serial production has more opportunities to avoid a negative scenario. For example, in the serial production of cars, a decrease in demand and sales can be partially offset by selling some of the products as spare parts, rather than as a finished product in a complete set. Mass production has even more opportunities, since these products can be used in various areas. Therefore, when calculating the integral indicator of non-dynamics, an additional coefficient can be introduced that takes into account the type of production.

The actual crisis resistance of an enterprise can be significantly affected by the specific state of the production process at the time of the crisis, the portfolio of contracts concluded for the supply of finished products at the time of the crisis, the actual course of the crisis, the timeliness of support and counteraction measures, the degree of imperfection of management, etc. A situation may arise when even the law of distribution of direct subsidies to an enterprise significantly affects its crisis resistance, forming a stochastic relationship between crisis resistance and the volume of subsidies [4]. Thus, with different values of the above and other factors determining the stochastic nature of the problem, an enterprise can either successfully overcome the crisis dynamics or go bankrupt as a result of the crisis. The use of a fuzzy linguistic variable allows us to take this circumstance into account, since a fuzzy variable can simultaneously belong to two opposite sets, in this case – enterprises that managed to overcome the crisis and those that went bankrupt during the crisis.

Conclusions. Thus, it can be argued that for some enterprises with weak dynamics, partial utilization of production equipment is not just inefficient, but in some cases even impossible. This significantly affects the search for effective strategies of production organization in the crisis period, making a significant reduction in production volumes out of the category of possible and acceptable solutions. Thus, it can be argued that the task of maintaining a high level of intellectual capital of an enterprise, without which its activity, as a rule, is simply impossible, significantly limits possible strategies for crisis organization of production. It is possible to form a linguistic variable taking into account the quality and completeness of information used in assessing the integral indicators of the non-dynamism of enterprises. On the other hand, the result of the work should be the reorganization of the production process in order to reduce the integral indicator of the non-dynamism of the enterprise, which entails an increase in its crisis resistance. Therefore, the set of measures to reduce non-dynamism developed for implementation comes to the forefront, leaving the numerical or probabilistic assessment of accuracy in less priority indicators, which, as was said above, also have a stochastic nature.

References:

1. Sosnovska O.O., Dedenko L.V. (2018), Napryami stiykogo funktsionuvannya pidpriemstva v umovah neviznachenosti [Trands of sustainable functioning of the enterprise in conditions of uniqueity]. *Zbirnik naukovih prats Universitetu Derzhavnoyi fiskalnoyi sluzhbi Ukrayini*, no 2, pp. 369–383. (in Ukrainian)
2. Lagunova I.A. (2018), Sutnist ta printsipi kontseptsiyi rizik-menedzhmentu. [Essence and principles of risk management concept]. *Aktualni problemi derzhavnogo upravlinnya*, no 1 (53), pp. 44–52. (in Ukrainian)
3. Dyadyuk M.A. (2017), Upravlinnya rizikami: konsp. lekts. [Risk Management: cons. lectures]. Harkiv: Fort. [Online], p. 165. Available at: http://elib.hduht.edu.ua/jspui/handle/123456789/1893 (accessed: 15.04.2022).
4. Posohov I.M. (2017), Suchasni mizhnarodni standarti rizik-menedzhmentu [Modern international standards of risk management]. *Suchasni tendentsiyi rozvitku svitovoyi ekonomiki*: zb. materialIv 9-yi Mizhnar. nauk.-prakt. konf., Harkiv : HNADU, Tom. 2, pp. 77–78. (in Ukrainian)
5. Gonchar G.P. (2014), Adaptatsiya svitovih standartiv rizik-menedzhmentu do diyalnosti vitchiznyanih kompaniy [Adaptation world standards of risk management to the activities of domestic companies]. *Efektivna ekonomika*, no 3. (in Ukrainian)
6. DudnEva Yu.E. (2019), Rizik-menedzhment: Integrovaniy pidhid do organizatsiyi [Risk management: an integrated approach to an organization]. *Ekonomika ta suspilstvo*, no 20, pp. 229–236. (in Ukrainian)
7. Moroz, I.O. (2017), Sutnist upravlinnya rizikami pidpriemstva ta navichki, neobhidni menedzheru dlya yogo provadzhennya [The essence of risk management of the enterprise and nurses, the necessary manager for its processing]. *Zbirnik materialiv Vseukrayinskoyi naukovo-praktichnoyi on-line konferentsiyi aspirantiv, molodih uchenih ta studentiv ZHDTU*. [Online], Tom 2. Available at: https://conf.ztu.edu.ua/wp-content/uploads/2017/06/115-1.pdf
8. Volinets I. (2016), Organizatsiya rizik-menedzhmentu na pidpriemstvi [The Organization of Risk Management at the Enterprise]. *Ekonomichniy chasopis Shidnoevropeyskogo natsionalnogo universitetu imeni Lesi Ukrayinki*, no 2, pp. 51–55. (in Ukrainian)

Бібліографічний список:

1. Сосновська О.О., Деденко Л.В. Напрями стійкого функціонування підприємства в умовах невизначеності. *Збірник наукових праць Університету Державної фіскальної служби України*. 2018. № 2. С. 369–383.
2. Лагунова І.А. Сутність та принципи концепції ризик-менеджменту. *Актуальні проблеми державного управління*. 2018. № 1 (53). С. 44–52.
3. Дядюк М. А. Управління ризиками: консп. лекц. Харків : Форт, 2017. С. 165. URL: http://elib.hduht.edu.ua/jspui/handle/123456789/1893
4. Посохов І.М. Сучасні міжнародні стандарти ризик-менеджменту // Сучасні тенденції розвитку світової економіки: зб. матеріалів 9-ї Міжнар. наук.-практ. конф., Харків : ХНАДУ, 2017. Т. 2. С. 77–78.
5. Гончар Г.П. Адаптація світових стандартів ризик-менеджменту до діяльності вітчизняних компаній. *Ефективна економіка*. 2014. № 3.
6. Дуднєва Ю.Е. Ризик-менеджмент: інтегрований підхід до організації. *Економіка та суспільство*. 2019. № 20. С. 229–236.
7. Мороз І.О. Сутність управління ризиками підприємства та навички, необхідні менеджеру для його провадження Збірник матеріалів Всеукраїнської науково-практичної on-line конференції аспірантів, молодих учених та студентів ЖДТУ. 2017. Т. 2. URL: https://conf.ztu.edu.ua/wp-content/uploads/2017/06/115-1.pdf
8. Волинець І. Організація ризик-менеджменту на підприємстві. *Економічний часопис Східноєвропейського національного університету імені Лесі Українки*. 2016. № 2. С. 51–55.

Стаття надійшла до редакції 08.12.2023