

Sustainability and efficiency of the functioning and development of the enterprise in the formal interpretation

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Abstract

Subject/topic. The article deals with the issues of enterprise sustainability and efficiency management. **Goals/Objectives.** Formalization of joint interpretation of concepts of sustainable and efficient operation and development of the enterprise. **Methodology.** The methodological basis of the study was monographic and analytical approaches, as well as methods of economic and mathematical modeling. **Results of the study.** The economic and mathematical description of mechanisms of selection of ways to ensure sustainable and efficient functioning and development of the enterprise is presented. The existing definitions of the sustainability and efficiency of the enterprise development are discussed separately and their fundamental essence necessary for the formal representation of their content is identified. The conclusion that it is necessary to jointly consider these concepts in statics and dynamics is justified. The concepts of «sustainability of operation» and «sustainability of development» of an enterprise have been introduced and their relationship has been determined. It is proposed to interpret the stability of the enterprise functioning as a set of permissible values of tracked indicators characterizing various aspects of its manifestation. The choice of the method of ensuring the stable and efficient functioning of the enterprise is formalized in the form of a conditional optimization task. Possible risks of ensuring effective functioning from the point of view of maintaining the sustainability of development are identified and ways of their compensation are proposed. The choice of a sustainable and effective way to develop the enterprise is formalized in the form of a multi-criterion optimization task. **Theoretical/practical significance.** The results of the study can be used as a platform for creating detailed economic and mathematical models for choosing ways to ensure the sustainable and effective development of enterprises. **Conclusions.** The choice of ways to ensure the effective functioning and development of enterprises is risky to build on the use of traditional single-criterion optimization methods due to the possible manifestation of unpredictable external disturbances that lead to transcending the permissible limits of stability characteristics.

Keywords: *enterprise, development, reliability, stability, efficiency, performance indicators, optimization*

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For citation

Bulgakov A.L. Sustainability and efficiency of the functioning and development of the enterprise in the formal interpretation // Market economy problems. – 2020. – No. 4. – Pp. 188-196 (In Russian).

DOI: <https://doi.org/10.33051/2500-2325-2020-4-188-196>