Management of Proportionality and Stability of Industrial Enterprises' Development Processes
(Aspects of Marketing and Production Management)

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Abstract — **In modern conditions of high dynamics of external factors, as well as the strengthening of competition for consumer demand, industrial enterprises need specific diagnostic tools to estimate the features of their development. This paper is devoted to description of the results of the work out of such diagnostic tools. Diagnostic adaptive-functional system of estimation of stability, proportionality and balance of industrial enterprises' development was developed. The research results also consist algorithm of estimation of the level of balance and stability of industrial enterprises' development**

Keywords — *development, proportionality, stability, balance, marketing, production management*

I. INTRODUCTION

The progressive path of industry development involves ensuring positive changes in the quantitative and qualitative indicators of enterprises' acting within the framework of the main types of business processes, taking into account the sectoral characteristics of development. Improvement of the dynamics of one of the indicators should not contradict the dynamics of other indicators of the enterprises' performance and should have harmonized features. Effective solution of strategic, tactical and operational tasks can be provided only in conditions of clear determination of development priorities of separate strategic units of managing and their internal business processes. Accordingly, the development indicators of the entire enterprise can't have the same impact on the achievement of the main goal – provision of the intensive development.

Diagnostics of proportionality, balance and stability of industrial enterprises' development should be based on calculations of generalizing indicators. The universal nature of these indicators should be defined as an opportunity that allows synthesizing not only information about the overall trajectory of the main indicators of the enterprise, but also as a tool to assess the proportionality and comparability in time.

In this situation, it is necessary to talk about the need to develop diagnostic tools for industrial enterprises' development provision, which can give opportunity to solve the problems of rapid estimation of the main features of the growth of enterprises. At the same time, it is necessary to take into account certain features of the use of both fixed assets and working capital. Significant attention should be paid to labor costs and their comparability with the costs of raw materials, amortization and depreciation. Attention should be paid to the processes of formation of free cash flows of enterprises and other financial aspects of their development, aimed on taking into account and consideration of all stakeholders' positions.

II. RELEVANCE, SCIENTIFIC SIGNIFICANCE OF THE INDUSTRIAL ENTERPRISES' DEVELOPMENT PROCESSES MANAGEMENT. A BRIEF LITERATURE REVIEW

The scientific importance of the issue is determined by the fact that the marketing leadership of the enterprise is largely determined by its ability to maintain a stable optimal proportion of growth for a long time. This potential increases the stability of the company on the market and allows implicating a long time usage of aggressive growth strategy.

The production aspect and the focus on operational efficiency is determined by the need for implementation of cost-effective leadership strategy. This potential allows to provide steady values of profitability and formation of steady cash flows for stakeholders in any market or macroeconomic conditions. These opportunities become particularly important in the context of crisis and falling demand, when it becomes necessary to reduce production volumes.

The problem of proportionality and stability of the development of business structures entrusted a significant development in scientific works that were devoted to management of agricultural enterprises [1; 2; 3; 4]. This was largely determined by the characteristics of the markets on which these enterprises operate. First of all, we are talking

about high competition and the significant impact of the highoperational cost ratio factor. It is also worth to note the works56 that described the character of the impact of stability and proportionality of development on the export potential of industrial enterprises. The work of manufacturing enterprises in the emerging markets is also largely influenced by factors of stability and proportionality,which has been repeatedly proved in the scientific works [7; 8; 9; 10]. In work of Y. Kubeyev, L. Shkutina, S. Karstina [11] and S. Simionescu, E. Bică [12] considerable attention was paid to the issues of mutual influence and the relationship between the peculiarities of the management style and economic indicators of enterprise growth. It is also worth noting the results of the analysis of the processes to ensure the stability of enterprises in the Asia-Pacific region, given in the work of A. Gabriele [13]. O.A. Latuha [14] determined sustainability of the economic growth as a key factor in successful development of organization in modern conditions. N.S. Souleles [15] and S.V. Gubarkov [16] insist on the main role of planning and budgeting in the field of sustainability gaining. At the same time A. Bucci shows in his work that volatility on markets can seriously distort any results of long term budgeting [17].

III. PROBLEM STATEMENT

Taking into account the presence of a significant number of disagreed views on the issues of stable proportional development of enterprises, as well as the lack of relevant research aimed on the formation of universal cross-sectoral management tools, scientific efforts should be directed to the development of appropriate methodological frameworks. The output of this work should be resulted in the kind of methodical instrument capable for solving the problems of stabilizing the management process of industrial enterprises.

IV. THE PRACTICAL SIGNIFICANCE OF THE PROPOSAL

The achievement of this goal is largely determined by the development of adaptive-functional models of enterprise development, which are based on the tools of fuzzy logic. This kind of models is based on the ideas of synthesis of dynamic development standards. A dynamic standard is a set of indicators ordered by the rate of their dynamics. At the same time, compliance with these proportions in the performance indicators of the enterprise provides higher results compared to previous periods. The analysis of literary sources [2; 5; 6; 9; 12] showed that the usually applied various variants of combinations of the enterprises' activity indicators for the decision of resource management, financial performance, sustainability of the enterprise performance tasks. Most often, the models of enterprise sustainability management were based on the definition of reference values of individual financial indicators. It is worth to note that indicators of operational, sales and commercial activity were earlier taken into account by nobody [18, 19].

It is obvious that the emphasis on financial performance does not solve the problems of production management and marketing management of enterprises. Thus, the construction of an effective adaptive-functional model of enterprise development requires the inclusion of functional standards indicators that characterize the marketing, production and technological components of enterprise development. For this purpose, a system of indicators was developed to determine the characteristics of stability and proportionality of enterprises' economic growth. Among the methodological foundations for the development of this system, we have used the principles of complexity, balance and consistency of evaluation procedures. Each of the functional areas of business process assessment includes the possibility of inconsistent optimization of interconnected subsystems of the enterprise economy and reduces the risk that certain aspects of development can be ignored (tab. 1). It should be noted that this system of indicators is made up of relative indicators that allow us to determine not only the overall trajectory of the enterprise, but also to show the qualitative changes in its production, technological and marketing business processes.

Table 1Diagnostic adaptive-functional system of estimation of stability, proportionality and balance of industrial enterprises' development

Processes	Description	Indicators
Production and technological processes	Calculation of the duration of the production cycle	The period of the production cycle
	Estimation of the efficiency of the use of production resources	Capital productivity
		Factor of negotiability of the working capital
		Productivity of labor
	Estimation of the level of cost effectiveness on raw material processing and production	Production profitability
		The capital intensity of production
		The labor intensity of the production
		Material intensity of production
	Estimation of efficiency of use of production capacities	Plant capacity
		Utilization factor of production capacity of the enterprise
Marketing processes	Determination of the efficiency of commercial services	The period of turnover of finished products
	Determining the effectiveness of sales services	The ratio of sales of finished products
	Determining the effectiveness of advertising and marketing activities	Factor of efficiency of advertising costs
	Estimation of competitive position of the enterprise	Relative market share of the enterprise

The use of this system is based on the methodological basis presented in the form of an algorithm (fig. 1). Practical application of this methodological approach in the form of an algorithm allows to do the operative diagnose of the enterprises' development processes, as well as individual indicators that interpret the characteristics of stability, proportionality and balance. This kind of tool open up opportunities for rapid application of corrective procedures and changes in certain characteristics of production and technology and/or marketing business processes. The result of

this kind of diagnosis and correction is to improve the competitiveness and efficiency of industrial enterprises.

| Development and/or adaptation of the system of indicators for estimation of individual characteristics of enterprise development for individual groups of key business processes |

| Calculation of average indexes of the enterprise development indicators' change in the context of separate business processes in the investigated period. Normative ordering of indicators by the method of sequential pair comparison |

| Characterization of the functional relationships of indices of development indicators' changes in certain areas of assessment and building the dynamic standard for a balanced development of the business processes of the enterprise |

| The analysis of linear dynamic standard using the mathematical tool of rank correlation | Analysis of nonlinear dynamic standard using mathematical tool of matrix theory |

| Calculation of the factor of rank correlation by deviations | The calculation of the rank correlation coefficient by inversions | The construction of the matrix of the indexes' reference comparison change |

| Construction of matrix-actual comparison of the indexes |

| Calculation of the final scalar assessment of the balance of business processes | Calculation of the difference between the reference and actual comparison matrices |

| Determination of the degree of matrices' similarity |

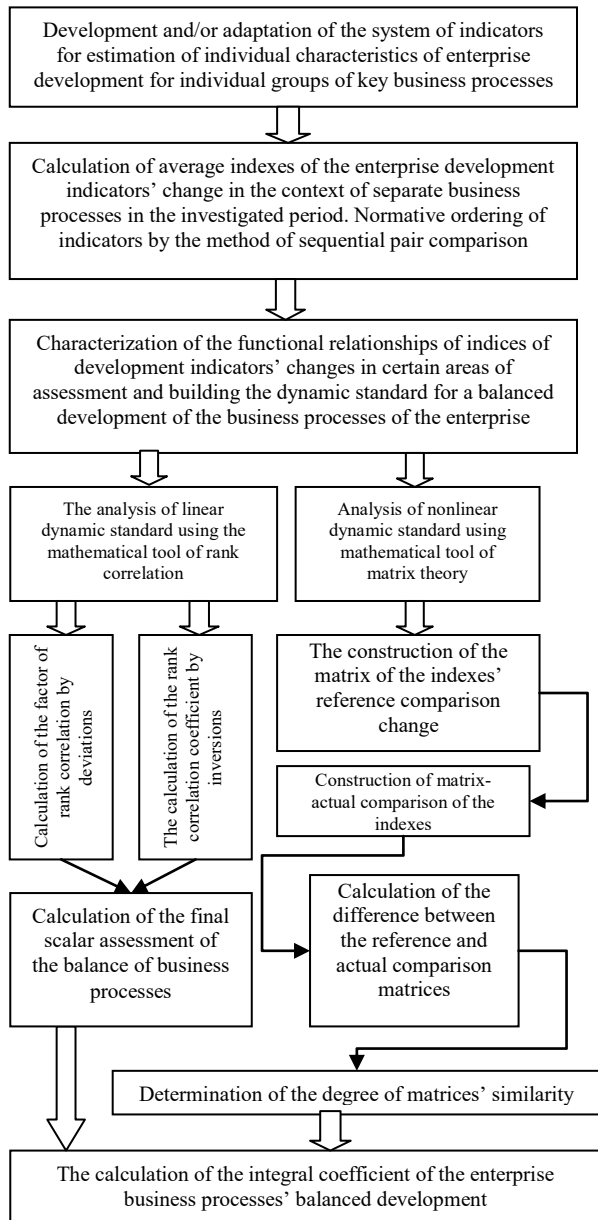| The calculation of the integral coefficient of the enterprise business processes' balanced development |

Figure 1. Algorithm of estimation of the level of balance and stability of industrial enterprises' development

An essential element of effective entrepreneurship is understanding and using the concept of marketing in enterprise management. Quality and social components of marketing in management are essential. Marketing strategy a highly profitable predetermine the rhythmic activity of the economic entities. As evidenced by the practice of economic activity of enterprises, the implementation of marketing, although becoming more common, but still many forms of marketing management are not fully used. Marketing strategies create prerequisites for ensuring the competitiveness of enterprises, adaptation to constant changes in the environment and market conditions, stability of economic conditions. In modern terms of functioning and development of economy, one of vital factors is knowledge and application of a marketing paradigm which allows the enterprise to occupy and hold a sufficient share of the domestic and international market and to receive the main result of activity of any enterprise – high level of profit at rather low level of expenses.

V. SUMMARY

The Ensuring of proportionality, stability and balance of the enterprises is an imperative of modern competition. In a large extent, this applies to emerging markets, where fluctuations in demand and changes in the business activities of industries are particularly noticeable. The proposed methodological tools allow quickly diagnose inconsistencies and prevent the emergence and development of crisis phenomena. This is particularly important at the stage of initial growth, when the enterprise aggressively enters the market and can ignore objectively existing weaknesses and strategic threats.

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