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Alla Kasych,

*Doctor of Economics, Professor, Head of the Department of Management,
Kyiv National University of Technologies and Design (Kyiv, Ukraine),
Institute of Technology and Business in České Budějovice
(České Budějovice, Czech Republic);*

Marek Vochozka,

*MBA, PhD Candidate (Economics),
Institute of Technology and Business in České Budějovice
(České Budějovice, Czech Republic)*

METHODICAL SUPPORT OF THE ENTERPRISE SUSTAINABLE DEVELOPMENT MANAGEMENT

The article deals with investigating the existing methodical approaches to the processes of sustainable development of enterprises, summarising conclusions of the scientists in this field. To determine the characteristics of the processes of enterprise sustainable development, the authors use such scientific and methodological approaches as combinatorial, structural, resource, harmonious interaction. The conceptual model representing the stages and tools, the implementation of which will provide a systematic solution of the sustainability problem, is suggested for implementing the theoretical positions of sustainable enterprise development in management practices.

Keywords: sustainability, development, efficiency indexes, methods of analysis, estimation criteria.

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Introduction. Implementation of the enterprise sustainable development theory into the modern management practice causes the actualization of the task of improving the existing methodological provisions of researching these processes.

Managerial decisions in the sustainable development field require enhancing the level of their justification due to using the integrated multi-level information.

However, the complexity of sustainable development processes, their dependence on many factors, and the difficulties of objective evaluation lead this issue to the level of a rather complicated scientific and methodological problem, especially from the point of view of forming a holistic methodology.

Analysis of the enterprise sustainable development by level of the complexity of the investigated information can be attributed to the highest ones, which determines a need in using not only the financial reporting indicators, but also other ones, such as the Sustainability Report, which is not mandatory for enterprises.

Accordingly, the list of indicators used for the analysis of the sustainable development is determined by the enterprise itself. The enterprises often conduct a sustainable development analysis in accordance with the requirements of the reports of such organizations as Global Reporting Initiatives, the United Nations Commission on Sustainable Development Framework, the methodology for determining the Dow Jones Index, the sustainability metrics of the Institute of Chemical Engineers, the McKinsey Company, etc. [10, 15].

The analysis of the latest researches and publications. The methodological issue of ensuring the analysis of the enterprise sustainable development processes has a rather wide representation in the scientific literature, in particular, E. Amrina and S. Yosof [9], F. Figge and H. Tobias [11], E. Kasem and O. Trenz [13], J. Keeble, S. Topiol, and S. Berkeley [14], E. Nicolăescu, C. Alpopi and C. Zaharia [15], S. Wagenhals and others [19], O. Honcharenko [2], H. Kindratska [3], O. Manoylenko and O. Syromyatnykova [4], O. Savytska and K. Zarechna [6], N. Shandova [8].

Among the most significant scientific results, the authors indicate the formation of the indicator system for sustainable development analysis [3, 8, 9, 10, 11, 15]; the development of the information processing methods [2, 4].

Methodological approaches suggested by academicians and analytical institutes are characterized by a certain diversity and have their advantages and disadvantages. Processing scientific literature on the sustainable development analysis of enterprises allows distinguishing several basic methodological approaches.

The first approach (effective-oriented) is based on the use of traditional indicators of performance and effectiveness. Traditional indicators are more often used for analysing the enterprise sustainable development, for example, effectiveness of the material resources usage (material input ratio / material return ratio); efficiency of the labour resources usage (labour productivity), financial results (profit), etc. A clear argumentation of the expediency of applying this approach is presented in the works of G. Atkinson, T. Hett and J. Newcombe [10], E. Kasem, O. Trenz and others [13], J. Keeble, S. Topiol, and S. Berkeley [14]. A sign of the sustainable development hereby will be the dynamics of the performance indicators. While determining the unsustainable company behaviour, S. Hart and M. Milstein [12], R. Pojasek [16] suggest using more modern output indicators, in particular, the business value.

The second approach (fragmented) provides a representation of indicators in terms of the components: economic, environmental and social. This fragmentary approach to analysis of the enterprise sustainable development is described in the works of E. Amrina and S. Yosof [9], S. Wagenhals and others [19]. The authors emphasize, first, the importance of the environmental responsibility of companies. Researchers conclude that business is less stable with greater negative environmental consequences, even if the other operation conditions are the same.

The third approach (balanced) bases on the balanced systems principles that are suggested to be used in the process of sustainability analysis. The scholars consider the problem of sustainable development due to the need in balancing economic, ecological and social development of the company and offer an algorithm of forming a set of indicators for all the main components of the sustainable development and integral indices. Such approach is substantiated, for example, in the works of F. Figge, H. Tobias and others [11], S. Wagenhals and others [19].

The fourth approach (complex) reveals not only the interconnections between indicators of sustainable development but also the dependence of these indicators on the factors of sustainability. Having examined the experience of development management, R. Pojasek [16] concludes that companies, characterized by high resilience, explore both components of financial sustainability and non-financial indicators.

The fifth approach (integrated) involves calculation of the integral index, which is formed by a certain

algorithm. An integrated approach is reviewed in the works of O. Savyts'ka and K. Zarechna [6], N. Shandova [8], S. Wagenhals and others [19].

Unsolved issues as a part of the general problem. In general, among scholars, there is a consensus on the need to form a company management system for providing sustainable development, but the issue of methodical support of the enterprise sustainable development management remains unsolved.

The purpose of the article is to substantiate the directions of improving the existing methodical approaches to the analysis of the enterprise sustainability development processes and to test them on the real enterprises.

The following tasks must be solved to accomplish the set aim:

- to determine the advantages and disadvantages of the existing methodological approaches to the analysis of the company sustainable development;
- to develop a method for studying the enterprise sustainable development which is based on the principles of the balanced scorecard system;
- to perform the experimental verification of the developed method on the example of the industrial enterprises and to determine the significance of the analysis results for decision making.

Results. The processes of enterprise sustainable development increasingly become the object of strategic analysis on modern enterprises and require the appropriate methodological support.

The methodology of sustainable development processes analysis should be considered as the basis of harmonization of the enterprise business processes with the tendencies of changes and the external environment requirements. The developed methodology should not only answer to the question of how sustainable the enterprise development is in accordance with the adopted criteria of sustainability and development, but also ensure the identification of key tools guiding the enterprise towards the appropriate changes.

Developing the methodology for analysing the enterprise sustainable development, the author insists on:

- comparing the basic methodical approaches for developing the analysis procedure;
- choosing an approach as a basis for the methodology of the enterprise analysis;
- developing the analysis algorithm by identifying its main stages;
- substantiating a list of indicators and principles of their grouping;
- determining the evaluation criteria of the selected indicator dynamics.

1. Comparison of the existing methodological approaches and the choice of the basic one for the analysis.

The methodological approaches offered by academics and analytical institutes are characterized by a certain diversity and have their advantages and disadvantages (Table 1).

Decision on choosing the enterprise management takes the methodological approach. In practice, several approaches are often used simultaneously, since this process is not regulated. The method suggested by the authors provides a combination of the benefits of these approaches.

2. Development of the algorithm for analysis by determining its main stages. A choice of the basic methodical approach determines procedural issues of carrying out the analysis of the enterprise stability development in practice. If the analysts use several approaches at the same time, the presented stages are also appropriate for use, since they provide a detailed study of sustainability.

3. Substantiation of a list of the sustainable development indicators and the principles of their grouping. The key issue in the analysis is the choice of the list of indicators and their classification. This process depends on the content of the methodological approach, which forms the basis of the analysis, and on the characteristics of the enterprise. In case of applying a fragmentary approach, the indicators are considered in the structured form and the important methodological issue is the choice of

the visual form of their presentation. By the results of processing the fragmentary indicators, an integral index for each direction of the stability study is calculated, as well as a generalized index. Accordingly, the main methodological issues are the question of forming the generalized indicator.

Table 1 – Advantages and disadvantages of the methodical approaches to the analysis of the enterprise sustainable development (developed by the authors)

Approaches	Advantages	Disadvantages
Effective-oriented approach	Sustainability can be studied from a position of the compliance with the goals set out in the list of the traditional performance indicators	The goal-setting process can have limited horizons. Besides, the company orientation at improving the performance during the economic crisis is not logical
Fragmented approach	The approach provides the detailed information for substantiating decisions relating to the separate areas of the enterprise activity by each type of responsibility (economic, social or ecological)	The approach does not allow tracing the relationship between indicators that reflect the sustainable development processes
Balanced approach	This approach presents sustainable development information in a structured manner, in accordance with the principles of the existing interrelationships between indicators	There are difficulties in the choice of indicators and their representation in the balanced form
Complex approach	It ensures research not only on the processes of the development sustainability but also on their factors	The complex approach contains a large amount of information that transforms analysis into a rather laborious process
Integrated approach	It allows presenting results of the analysis in the generalized way by forming and calculating the integrated index	In practice, the main task is not to determine the overall level of sustainability, but more importantly, to decompose it into parts

4. Determination of the criteria for evaluating dynamics of the selected indicators.

To transform the results of the analysis into managerial decisions, it is necessary to adopt the criteria for evaluating the dynamics of the calculated indicators, which meet the needs. So, the development can be characterized by the stable, unstable pace and can be accelerated – as far as the quantitative indicators are concerned.

In general, in the process of developing the analysis method of the enterprises sustainability development, the following circumstances should be considered:

- the process of ensuring the enterprise sustainable development is complex and multifaceted, accordingly, the method of analysis should be multilevel and multifaceted;
- only some factors of development sustainability have quantitative indicators that can be used in the analysis process;
- the basis of the methodology of analysis of the sustainable development should be the process of forming a model of the cause-effect relationship studied phenomena which will be the basis for developing an integrated multilevel approach to analysis.

To substantiate the improved approach to analysis of the enterprise development processes, the following information should be used:

- firstly, the principles of studying the processes of the sustainable development of society at the macro level, in particular, development, openness, interdependence, justice, prudence and security principles, which can be effectively used at the micro level as well. This will give an opportunity to

construct an organization of analytical procedures at the enterprise, considering the requirements of the modern science and practice in the field of sustainable development and to ensure synchronization of the development at the micro level in accordance with the external environment development trends;

– secondly, a matrix approach with application of the principles of the balanced system of indicators that allows systemising the indicators based on a need of considering their interconnections and interdependencies;

– thirdly, different time horizons of research: in the case of the analysis of current sustainability, an object of the analysis is the processes of the enterprise activity; in the short-term, efforts of analysts focus on the assessment of the expected results; in the long run, factors and possible trends of their development become the most important objects of the analysis;

– fourth, classification of the types of sustainability taking into account the division of the environment into internal and external ones that allows considering the enterprises development in accordance with the changes in the environment and forming a vision of sustainability by taking into consideration these features.

Accordingly, when it comes to the development, it is more likely to be unstable with a certain amplitude: low dynamics, medium and high dynamics. Based on the above definition, the offered arguments and given the need to find innovative approaches to analysing the processes of the enterprise sustainable development, the following form is suggested to be analysed (Table 2).

Table 2 – Balanced Indicators Scoreboard for Assessing the Sustainability of the Enterprise Development (developed by the authors)

Types of sustainability and research levels	Internal sustainability of development				Sustainability of the environment			
	absolute sustainability	unstable dynamics			absolute sustainability	unstable dynamics		
		low-level	middle-level	high-level		low-level	middle-level	high-level
Resource sustainability	- sustainability of assets; - sustainability of material-technical supply; - sustainability of production potential development; - sustainability of personnel potential development				- sustainability of economic development of the country; - sustainability of the demographic situation; - sustainability of the education sector; - sustainability of scientific and technical development;			
Process sustainability	- sustainability of business processes; - sustainability of investment processes; - sustainability of initiatives; - sustainability of innovation activity; - sustainability of product sales; - sustainability of contractual relations				- sustainability of the development of the resource base of production			
Functional sustainability	- industrial sustainability; - financial sustainability; - managerial sustainability; - social sustainability; - environmental sustainability				- sustainability of commodity markets; - sustainability of the financial market; - political sustainability; - sustainability of problem solving			
Resilience of results	- sustainability of profitability; - sustainability of business activity; - sustainability of the value of shares and the enterprise; - resistance to reduce costs				- sustainability of GDP dynamics; - sustainability of dynamics of industry production volumes; - sustainability of the dynamics of investments in the economy and industry, including investment in R&D			

Using the designed scoreboard, the company can explore:

– *firstly*, the sustainability of the external environment development which greatly affects the dynamics of each enterprise development. Thus, a concordance of the development trends of the enterprise and the environment characterizes the situation when the company fully uses the external potential of the development.

– *secondly*, the sustainability of the internal environment development, moreover with an application of all the most objective approaches to its definition. For each direction and type of stability, it is necessary to select a set of indicators that will be used as quantitative characteristics.

The data processing should use the indicator of the growth rate ($T_{Z_t^{Ni}}$):

$$T_{(Z_t^{Ni})} = \frac{Z_t^{Ni}}{Z_{t-1}^{Ni}}, \quad (1)$$

where Z – the value of the i^{th} indicator for the N^{th} type of sustainability at time t .

The determination of the coefficient for a certain type of sustainability ($K_{st}^{Z^{Ni}}$) is proposed to be carried out by calculating the arithmetic indicator.

$$K_{st}^{Z^{Ni}} = \sum T_{Z_t^{Ni}} / t. \quad (2)$$

Since, a group of indicators is formed for each type of sustainability that can be supplemented by another (to improve the quality of the analysis), so it is necessary to calculate the integral index of stability (IK_{cm}^N) for the generalized characteristic:

$$IK_{st}^N = \sqrt[n]{\prod_n Z_{st}^N}. \quad (3)$$

The presented algorithm allows determining the following levels of stability in accordance with the values of the obtained coefficients:

– absolutely stable dynamics of the development ($IK_{st}^N=1$) when there is a preservation of indicator growth rates at a certain level during the studied period;

– unstable dynamics of the development for a certain type ($IK_{st}^N > 1$) means excess of the growth rate;

– unstable dynamics with destructive consequences ($IK_{st}^N < 1$).

Deviations in the direction of growth or decrease can have different quantitative values, respectively, the authors propose to distinguish:

– low dynamics with the deviation of indicators to 5%;

– dynamics with average indicators (6-15%);

– high indicators (16-25%).

The presented form allows presenting the results of development stability analysis in the form of the systematic list of interrelated indicators, which represent a complex characteristic of sustainable development processes in the balanced form. As the criteria of evaluating the dynamics of development, it is expedient to use the indicators of competitors, the industry averages, the best industry experience, and the indicators of global leaders.

5. Results of the development stability analysis

To ensure the implementation of the submitted scoreboard in the analytical practice, the authors make calculations of the enterprise development sustainability, using information of the motor industry (Ukrainian and foreign) during the period from 2008 to 2015. PJSE "AvtoKrAZ" – the only Ukrainian company that manufactures large-wheel cars, the Kamaz Group of Companies is a competitor of the Ukrainian company, which has managed to almost oust it from the Russian Federation market. Volkswagen is selected as an example of one of the most powerful global players in the automotive market.

The first stage of stability analysis can be the comparison of the internal and external stability of the studied enterprises (Fig. 1-3).

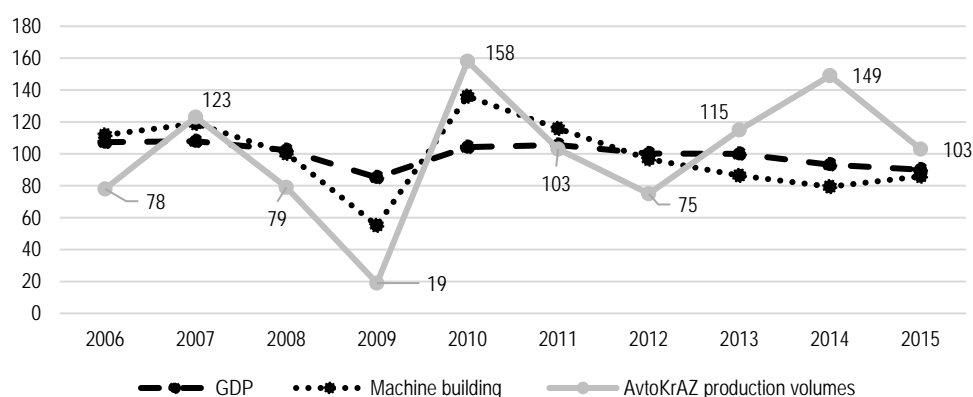


Figure 1 – Dynamics of the sustainability of AvtoKrAZ development in comparison to the dynamics of GDP of Ukraine and the dynamics of production volumes of motor industry (in % to the previous year) (developed by the authors according to the data [5, 7])

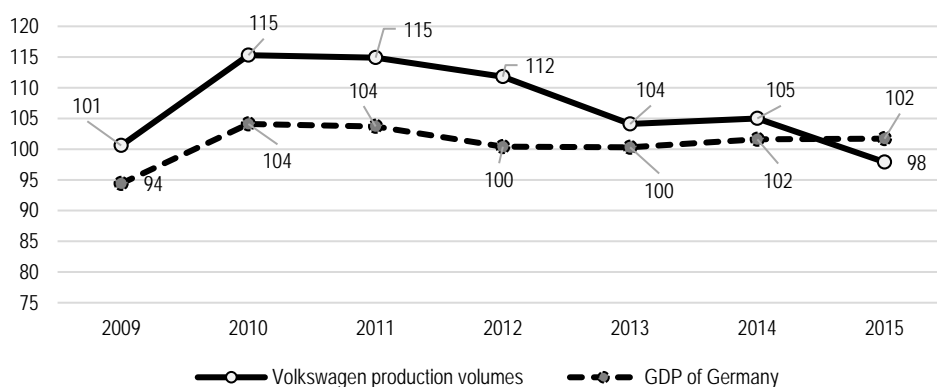


Figure 2 – Dynamics of the sustainability of Volkswagen development in comparison to the dynamics of GDP of Germany (in % to the previous year) (developed by the authors according to the data [17, 18])

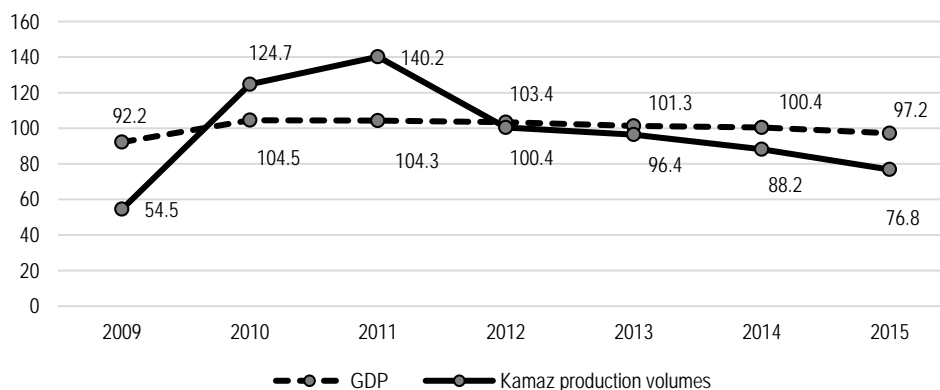


Figure 3 – Dynamics of the sustainability of Kamaz Group development in comparison to the dynamics of GDP of Russia (in % to the previous year) (developed by the authors according to the data [1, 18])

Even at first sight we can mark a higher amplitude of the enterprise development unstable dynamics compared to the pace of the industry and economy and it requires a more detailed and comprehensive analysis of the internal sustainability.

The appropriate calculations to the data of the investigated enterprises are carried out based on the Scoreboard, presented in Table 2, The results of the analysis are given in Table 3.

Table 3 – The results of analysing the development sustainability of automobile enterprises (calculated by the authors according to the data [1, 5, 17])

Types of stability (indicators to calculate)		AvtoKrAZ	Kamaz Group	Volkswagen
a) Resource Stability		0.962	0.976	1.107
1	- sustainability of the value of total assets	1.045	1.015	1.127
2	- sustainability of the value of fixed assets	0.930	0.977	1.119
3	- staff sustainability	0.916	0.938	1.075
b) Processes stability		0.994	1.013	1.118
1	- sustainability of business processes	1.035	0.973	1.071
2	- export sustainability	1.165	0.998	1.035
3	- sustainability of investment activity	0.962	1.057	1.112
4	- sustainability of innovation activity	0.843	1.025	1.132
c) Functional stability		0.981	1.138	1.261
1	- industrial sustainability	1.035	0.975	1.079
2	- financial sustainability	0.870	1.003	1.635
3	- social sustainability	1.051	1.142	1.175
4	- ecological sustainability	1.020	1.019	0.967
d) Sustainability of results		0.657	0.598	1.172
1	- sustainability of income	1.280	1.032	1.069
2	- sustainability of profits	0.210	0.621	1.333
3	- sustainability of stock value	0.780	0.334	1.129
Generalized sustainability indicator		0.886	0.906	1.163

Based on the presented data, significant differences can be noted in the sustainability of the researched enterprises. Therefore, Volkswagen demonstrates the highest dynamics. The basis of the steady performance of the enterprise is the steady dynamics of the development of all components. The development of the other two companies is unsustainable, but for various reasons. Thus, at AvtoKrAZ the unstable dynamics of resource provision and the decrease of investment and innovation activity cause a significant deterioration of performance. The safety margin of Kamaz Group is higher, but the decline in production stability leads to the diminishing of results, and therefore the overall sustainability of the company's development.

In general, the scoreboard of the balanced indicators of stability allows:

Firstly, assessing sustainability for each type and combining their benefits;

Secondly, analyzing sustainability of the studied enterprise in comparison to other enterprises (competitors) and determining the level of the development sustainability of subsidiaries for the integrated structures.

The implementation of a monitoring system of development sustainability on the basis of the formed methodology allows to determine the business-model that can provide a comprehensive and balanced development of the company. Ukrainian companies should be focused on international business models and take into account the following basic principle: measures aimed at ensuring sustainable development are transformed into stable investments and the image of the enterprise. Sustainable development is considered as the desired state to which the enterprise moves by different combination of internal capabilities according to the development trends of external environment.

Conclusions and prospects for future studies. In modern conditions, the key challenge for each enterprise is to ensure the sustainable development at any given time. It is a difficult management issue because even preserving the existing positions and ensuring the stable indicators can be a great achievement in times of the economic crisis.

Since the process of forming the effective business models of the enterprise development continues, the process of finding methodological approaches to the analysis of the processes of sustainable development, which would ensure formation of an objective, comprehensive and multi-media development strategy of the company, remains too.

The analysis methodology of the enterprise development sustainability is considered as an instrument for incorporating sustainable development issues into the managerial practice. To improve the quality of the solutions on the information provision in the field of the sustainable development, the authors suggest the balanced scoreboard of the sustainable development formed taking into account the importance of using multi-level information and the need in synchronizing the internal and external stability characteristics.

In general, promoting the business sustainability standards will increase the reputation and value of the entire company, and therefore the need for the developed methodological approaches will increase too.

The issue of using the analysis results in the processes of developing the sustainable development strategies requires further research.

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А. Касич, д-р екон. наук, професор, завідувач кафедри менеджменту, Київський національний університет технологій та дизайну (м. Київ, Україна), Інститут технологій та бізнесу в Чеське Будейовице (м. Чеське Будейовице, Чеська Республіка);

М. Вохозка, MBA, доктор філософії (економіка), ректор, Інститут технологій та бізнесу в Чеське Будейовице (м. Чеське Будейовице, Чеська Республіка)

Аналітичне забезпечення управління стійким розвитком підприємства

У статті систематизовано існуючі методичні підходи до аналізу процесів стійкого розвитку підприємства, узагальнено їх переваги та недоліки при практичному використанні. Також було досліджено особливості алгоритму проведення аналізу стійкості розвитку, критерії оцінювання одержаних результатів. На основі систематизації існуючих показників, які використовуються в аналітичній практиці підприємств, було запропоновано табло ключових показників стійкості розвитку підприємства, сформоване із застосуванням принципів збалансованої системи, що дозволяє сформувати набір багаторівневої інформації для підвищення ефективності управління стійкістю.

Ключові слова: стійкість, розвиток, показники ефективності, методика аналізу, критерії оцінювання.

А. Касич, д-р екон. наук, професор, заведуючий кафедрою менеджменту, Київський національний університет технологій та дизайну (г. Киев, Украина), Інститут технологій та бізнесу в Чеське Будейовице (г. Чеське Будейовице, Чехія);

М. Вохозка, MBA, доктор філософії (економіка), ректор, Інститут технологій та бізнесу в Чеське Будейовице (г. Чеське Будейовице, Чехія)

Аналитическое обеспечение управления устойчивым развитием предприятия

В статье систематизированы существующие методические подходы к анализу процессов устойчивого развития предприятия, обобщены их преимущества и недостатки при практическом использовании. Также были исследованы особенности алгоритма проведения анализа устойчивости развития, критерии оценки полученных результатов. На основе систематизации существующих показателей, используемых в аналитической практике предприятий, было предложено табло ключевых показателей устойчивости развития предприятия, сформированное с применением принципов сбалансированной системы, позволяющей сформировать набор многоуровневой информации для повышения эффективности управления устойчивостью.

Ключевые слова: устойчивость, развитие, показатели эффективности, методика анализа, критерии оценки.

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