

## Determination of structural changes efficiency in the economic system of the region in the context of implementation the Concept of Sustainable Development

**Dmytro Solokha**

Donetsk State University of Management, Ukraine  
ORCID: 0000-0002-6022-1791, e-mail: solokha.dm@gmail.com

**Oksana Bieliakova**

Azov Maritime Institute of the National University "Odessa Maritime Academy", Ukraine  
ORCID: 0000-0003-0363-4239, e-mail: tttt66t@ukr.net

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**Abstract:** The paper presents the results of scientific research to address the issue of assessing the effectiveness of structural changes in the regional economic system that take place in the context of the practical implementation of the basic principles of the Concept of Sustainable Development in Ukraine. Based on the analysis of literature sources on the profile of the research, the proposed use of the program method for the formation of strategic plans for regional development on the basis of effective functioning of system-forming both in relation to the regional economic system and for the national economy as a whole. And long-term development programs and the main tasks of such development are defined. It is proposed to introduce a system of constant monitoring of certain components of the principles of sustainable development of the regions of Ukraine, scientific circulation is recommended to be supplemented by the economic category of the effectiveness of structural changes, its characteristics are given. To assess the effectiveness of structural changes at the regional level, taking into account the requirements of sustainable long-term development, it is proposed to use an index assessment method, in particular, an aggregate index of development efficiency.

**Keywords:** sustainable development, region, efficiency, structural change, concept.

**JEL:** O18, R11, R13

### Introduction

The last quarter of the XX century and the beginning of the XXI have been marked in the world economic history by the processes of formation and implementation in the practice of social development and economic activity of the main provisions of the Concept of Sustainable Development [HRYSHYN Y., 2007].

The basis of this concept is the solution of a threefold task, namely to ensure sustainable harmonious development of the economy, ecology and society of regions, countries and civilization in general in the long run.

It is the implementation of the basic principles of the Concept of Sustainable Development that prompted the rulers, business leaders and society as a whole to understand the solution to problems and tasks of further development of civilization from the standpoint of unity of existence in a single geopolitical space.

The coronavirus epidemic, which spread all over the world almost a year ago, was a clear confirmation of the unity of problems, tasks, and the search for ways to solve them in the globalized world.

The epidemic emphasized that in the world, with its comprehensive processes of globalization, there are no separate problems, continents, countries or regions [DROBYAZKO, HILORME, SOLOKHA & BIELIAKOVA, 2020]. According to the research [VERNADSKYI V., 2004], we fully share the scientific opinion on the development of the noosphere, civilization develops according to certain laws, principles and principles of their implementation, regardless of the geopolitical positioning of countries and their individual territories on the world map.

Extensive mechanism of development of industrial production systems and their complexes in the second half of the twentieth century prompted scientists, industrial owners and government officials at various levels to find fundamentally new ways to transform technological systems to move from one way to another - higher.

The solution of these problems is possible only under the conditions of transition to intensive functioning and development of production, to provide its effective restructuring starting from the enterprises of regional level and to the world scale on the basis of realization of provisions and tasks of the Concept of sustainable development. Therefore, the chosen topic of research, the main results of which are presented in this article is quite timely and relevant.

### **Theoretical prerequisites for effective changes in the production regional structure**

Ukraine, as a sovereign state immediately after gaining independence, acted as a signatory to the Concept of Sustainable Development, and at the same time, as a full participant in the international market of goods and services, and a successful participant in globalization.

According to economists-historians [LAZAROVYCH & LANOVYK, 2003], at the time of gaining independence – August 1991, Ukraine had the most depreciated fixed assets and depleted natural resources, with 15 countries that emerged in the post-Soviet space, the situation with other productive resources was unsuccessful.

In Ukraine and its regions, there was a lack of financial resources, there were no models and mechanisms for attracting investment resources (both internal and external) in the real sector of the economy, the researchers argue [MAROVA, TOKAREVA, SOLOKHA, NOGA & TURBINA, 2019].

Thus, the regions and their system-forming enterprises faced the problem of developing strategies for effective management of restructuring of economic systems, determining the main factors influencing these processes and their effectiveness in the long run on the basis of the Concept of Sustainable Development [DROBYAZKO, OKULICH-KAZARIN, ROGOVYI, GOLTVENKO & MAROVA, 2019].

Restructuring of regional economic systems requires a certain model on the one hand, assessment of its effectiveness, on the other there is a need at the present stage of transformation of socio-economic relations at the regional level to strengthen social responsibility of business structures as one of the requirements for sustainable development in strategic perspective [BREUS, SOLOKHA, BIELIAKOVA, DERII, DIELINI & 2020].

Leading modern scientists have devoted their scientific works to the task of restructuring regional economic systems, ensuring their sustainable development in the strategic perspective and assessing the effectiveness of such development. The above encourages the deepening and expansion of the horizons of further scientific research.

The scientific developments of the above scientists have formed the theoretical and methodological basis of our study and once again prove its timeliness and feasibility.

The research, the main results of which are presented in this article, is an integral part of the research work of the Donetsk State University of Management of the Ministry of Education and Science of Ukraine and the Azov Maritime Institute of the National University "Odessa Maritime Academy" of the Ministry of Education and Science of Ukraine: "Reasons for imperatives of innovative providing of the region" (0115U000561); "Formation of theoretical and methodological foundations for the economic development of the region and its evaluation in the strategic perspective" (0115U006581).

## **Methodology**

The methodological basis of this study were both general and special approaches to the organization and conduct of scientific research, as well as scientific development and

generalization of leading domestic and foreign scientists of today. The purpose of the study is to determine the theoretical prerequisites and the formation of practical recommendations for the effectiveness of structural changes in the economic system of the region in the context of the implementation of the Concept of Sustainable Development in Ukraine.

Program approach and monitoring of sustainability of development of regions of Ukraine

To implement the provisions of the Concept of Sustainable Development at the regional level and at the level of the country as a whole, a software method of solving development problems is needed, as evidenced by the authors [BREUS, SOLOKHA, BIELIAKOVA, DERII, DIELINI, 2020], that the basic industries of the region, as well as some old industrial regions of Ukraine are most vulnerable to depressive processes and need a radical restructuring, the main purpose of which is to define and implement a system of measures to ensure not only crisis prevention and stabilization of individual industrial enterprises conditions for effective sustainable regional development in the long run.

The process of integration of all parameters of development of industrial regions involves solving problems of different levels. In relation to the program-targeted solution of the problems of effective sustainable development at the regional level of government, the main efforts should be directed not so much to the creation of new development programs, but to assessing the effectiveness of the existing ones, their necessary adjustment and development of a monitoring system.

As obligatory stages of this process, we suggest to allocate the following – maintenance of coherence of regional development programs with branch, possibility of modification in connection with limited resources and with specification of priority of program actions, necessity of change of territorial proportions in distribution of means for realization of development programs.

The practice of managing the implementation of programs (organization of management, forms of implementation, interaction with regional and local authorities, etc.) also requires significant improvement on the basis of the experience gained now.

In this regard, when developing a mechanism for strategic management of sustainable development, it is necessary, firstly, to determine what specific measures should be taken in the economic space of the region in the first place, and secondly, to create conditions

for optimal combination of state and market regulation of the effectiveness of sustainable development.

It should be noted that the main feature of the existing programs of long-term sustainable development of the regions of Ukraine is the development and justification of investment projects, the implementation of which requires production resources in certain, quite significant amounts, as evidenced by scientists [ZHOLONKO, GREBINCHUK, BIELIKOVA, KULYNYCH & OVIECHKINA, 2021].

Obtaining additional resources for the medium in the long term for the implementation of investment programs (in fact, these are existing programs for the development of specific enterprises) in conditions of limited financial resources is a difficult practical task, especially for large industrial enterprises, because the state budget can provide only part of the financial needs and resources.

The current system of monitoring and development of medium- and long-term forecasts, concepts and programs of sustainable socio-economic development creates more favorable conditions for linking regional programs with national parameters, and, most importantly, for more realistic linking of projected needs with resources for their pleasure [BREUS, SOLOKHA, BIELIAKOVA, DERII & DIELINI, 2020]. At the same time, there are extra-budgetary sources of funding.

The best solution is to achieve a situation in which the implementation of programs (after a certain initial period, when you need to attract investment) creates sources of accumulation of investment resources for further development of the program.

In order to assess the effectiveness of existing development programs, the formation of components of the strategy of integrated growth of industrial enterprises in the region, optimization of financial flows for specific development goals, it is proposed to use the following sequence of coordination functions at the regional level of long-term sustainable development:

- identification of measures implemented through sectoral, regional programs and development programs of specific industrial enterprises and concentration (“collection”) of financial resources of all programs to address key issues;
- identification of the most significant financial sources of regional development throughout the system of development programs;

- coordination of the implementation of all programs as a single system of activities in a particular area;
- justification for the formation of the necessary additional regulatory framework for the development of the region (“framework” conditions) for a specific period of time;
- forecasting markets for products produced in the region;
- coordination of actions of regional authorities and local governments;
- selection of stages of development of regions with definition of methods and ways on how to make decisions on them, or the problems at each individual stage.

The implementation of targeted programs depends on the validity and effectiveness of operational decisions made on the basis of analysis of the implementation of program activities. In this regard, it is necessary to organize effective monitoring of implemented programs at the regional level.

The purpose of the proposed monitoring system should be regular monitoring and forecasting of the impact of changes in the functioning and development of industries and individual enterprises on the economic situation in the region, which, in turn, will allow to make the necessary management decisions in both economic and social spheres, to the provisions of the Concept of Sustainable Development.

This approach will increase the efficiency of managing the implementation of programs aimed at solving strategic development problems, taking into account the social and economic consequences.

Monitoring the implementation of development programs should show the degree of impact of these programs on changes in the socio-economic situation in the region, the effectiveness of program measures, the adequacy of methods and forms of implementation of socio-economic, natural and other features. Based on this, the main functions of the proposed monitoring system should be:

- collection and statistical processing of information on the implementation of development programs in the region;
- control over the implementation of program measures and their financial support with the allocation of industrial complexes and specific industrial enterprises in terms of individual areas of the region;

- coordination of measures of regional programs with the state forecasts of social and economic development and investment programs of concrete enterprises;
- coordination and reciprocity of the carried out program actions of programs of various function;
- preparation of information and analytical materials to substantiate the sequence of program activities and the list of programs proposed for funding in the next period;
- preparation of the regional section of the target programs which are included for financing in the project of the state budget.

The proposed system of monitoring regional programs of sustainable long-term development will contribute to solving such problems as clarifying the place of regions in the new system of interregional division, formed in the deepening of territorial and administrative reform, work in the country, more complete reflection of regional features. adjustment and coordination of programs implemented in the regions in order to maximize the effectiveness of regional development in the long run.

Evaluating the effectiveness of structural changes at the regional level.

The effectiveness of the strategy of integrated growth at the level of industrial enterprises is directly related to the structural transformations that are needed not only in the national economy, but also (perhaps even more) in each individual region of Ukraine.

Uncertainty of the basic concept of the effectiveness of structural change requires the introduction of a new term, “functional efficiency of development”, which can be understood as a set of effectiveness of specific methods and techniques aimed at structural change and directly dependent on certain management functions of regional development.

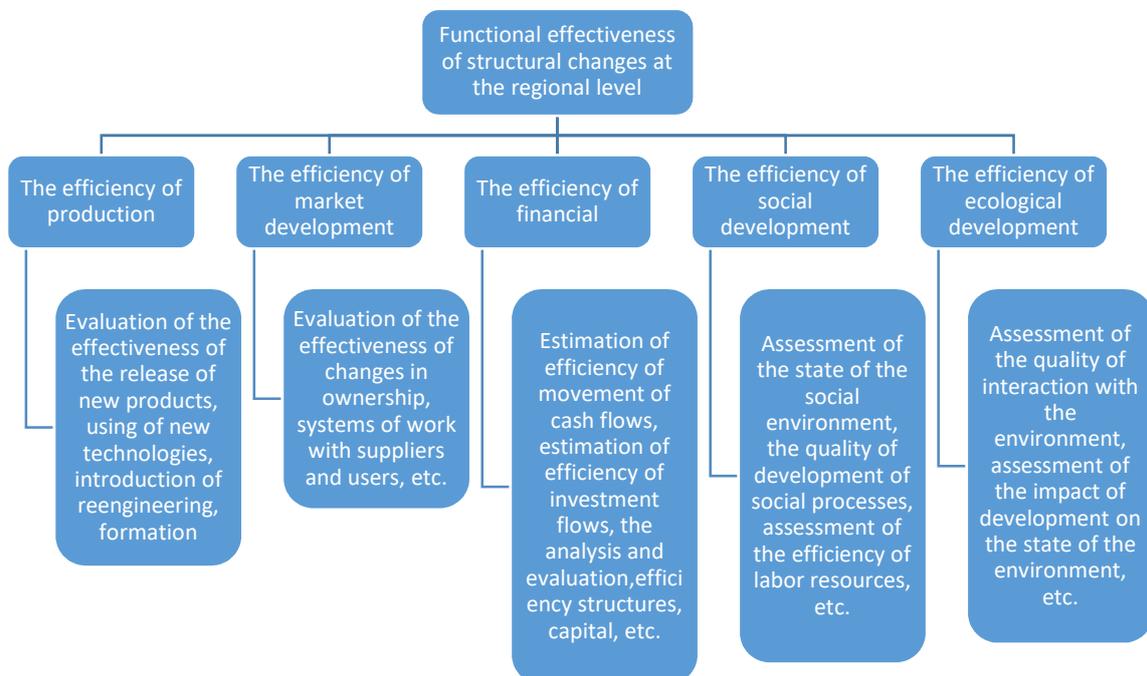
Any function or set of functions of the socio-economic system should be subject to structural changes in this case. Thus, the functional effectiveness of structural changes can be assessed by comparing the costs and results associated with the implementation of certain structural changes within the organization, aimed at achieving the optimal balance between the effectiveness of the organization and the stability of its position in the regional context.

This process is associated with the allocation of such key areas for assessing the effectiveness of regional development as the effectiveness of industrial, market, financial, social and environmental development. Accordingly, it is advisable to identify the following types of functional efficiency of structural changes (Fig. 1).

Next, we highlight and explore in more detail the following types of functional effectiveness of structural changes at the regional level:

- efficiency of production changes or production development (assessment of the effectiveness of the transition to the production of new products, the transition to a new production technology, a radical change in production activities);
- efficiency of market development (assessment of the effectiveness of changes in the form of ownership, the system of work with suppliers and consumers);
- efficiency of financial development (assessment of the efficiency of cash flows, assessment of the efficiency of investment flows, analysis and assessment of the effectiveness of capital structure, etc.);
- efficiency of social development (assessment of the state of the social environment, quality of development of social processes, assessment of the efficiency of labor resources, etc.);

Figure 1. Types of functional efficiency of structural changes at the regional level



Source: own work

- efficiency of ecological development (assessment of the quality of interaction with the environment, assessment of the impact of development on the state of the environment, etc.).

The analysis of efficiency of structural changes and, accordingly, possibilities of long-term development on the named functional groups allows to define preconditions and conditions of effective regional development in strategic perspective taking into account features of a concrete region and the requirements of the Concept of sustainable development.

The selected elements are the main ones, because they form the development process and are system-creating for it. At the same time, structural changes affect not only the elements of the system, but also internal system relations – development management (according to management levels - national development management, regional development management, development management at the level of industrial systems, enterprises), development strategy, interaction between different levels of government, etc. Thus, it is necessary to evaluate the effectiveness of internal systemic structural changes.

The efficiency of production changes, or production development, is directly related to the introduction of production innovations, technological structural changes.

These include:

- production of completely new products at old or newly created facilities. Many enterprises in the region, which found themselves in a state of crisis, tried to find their niche through radical industrial transformations;
- strengthening of competitive positions on the basis of introduction of reengineering or modernization of business, release of production unique for a separate region (and the country as a whole);
- formation of technological clusters, which involves the integration of different enterprises within one production complex into a single structure in order to create a continuous technological chain for the production and sale of any type of product.

At the same time, as a rule, it is possible to reduce the cost of production (including those consumed at different stages of the process), accelerate its implementation, vary as needed its quality and technical characteristics, as well as normalize cash flow between organizations in the technological chain.

The effectiveness of financial development is assessed on the basis of the state of incoming and outgoing cash flows. At the enterprise level, it is reflected in the balance sheet, in terms of its articles. Therefore, the effectiveness of financial change is assessed in the following blocks:

- efficiency of use of enterprise assets;
- efficiency of use of liabilities of the enterprise.

In assessing the effectiveness of the use of assets, of particular importance for enterprises are the management of structural changes in the composition of assets out of circulation and receivables.

These changes are usually a maximum reduction in the share of non-profit or low-income assets in their total structure. The reduction primarily includes objects of the socio-cultural sphere (kindergartens, community centers, health facilities, etc.), which were previously listed on the balance of large enterprises.

The efficiency of the use of liabilities for industrial enterprises is associated with structural changes in the composition of equity and accounts payable. A change in the structure of owners is not only a strengthening of the positions of certain parties at the expense of others, but a change of owners in general.

Changes in the composition of accounts payable are aimed at overcoming the crisis related to debts that have accumulated during the crisis of the enterprise.

Ways to overcome such situations may not be entirely correct, because they involve either the "freezing" of part or all of the debt, or such a way of financial recovery, in which debtor companies create new companies, not burdened with obligations, and the "old" enterprise remains the formal defendant in a generally hopeless obligation.

It is quite difficult to formalize the assessment of the effectiveness of market and intra-systemic changes. The object in these cases is the form of ownership of the enterprise, the type of economic activity (work according to certain schemes), the management system of the enterprise (for example, a comprehensive information system).

The social and ecological functional efficiency of the development of industrial enterprises is the most difficult in terms of their assessment. The reason is that their implementation has the main purpose of stabilizing (both internal and external) organizations, and therefore can not count on an increase in profits in the short term. As the vast majority of enterprises are concerned with resolving current financial issues while completely ignoring

the problems of strategic development, social and environmental factors are practically not considered by them today.

Managers and owners of enterprises pursuing strategic goals can succeed only by increasing a particular type (or set of types) of functional efficiency, depending on the objectives.

To assess these types of efficiency and, based on the strategic approach to the need to integrate all components of industrial development, we propose to use the following aggregate efficiency index of industrial development:

$$I_{id} = I_{fpe} * I_{ffe} * I_{fme} * I_{\phi\beta\alpha} * I_{fse} * I_{fee},$$

where  $I_{fpe}$  – index of functional production efficiency;

$I_{ffe}$  – index of functional financial efficiency;

$I_{fme}$  – index of functional market efficiency;

$I_{fise}$  – index of functional internal system efficiency;

$I_{fse}$  – index of functional social efficiency;

$I_{fee}$  – index of functional ecological efficiency.

The value of each index is defined as the ratio of indicators for the current and base periods, respectively. Given that each of the selected types of efficiency is a complex value, for their calculation it is advisable to use the method of Academician [AMOSHA O., 2002], according to which it is formalized as follows:

$$E = \sum_{i=1}^n E_i \pm \sum_{i=1}^n E_{ni}$$

where  $E_i$  – efficiency obtained due to the  $i$ -th factor of production, technical, organizational or social nature;

$E_{ni}$  – efficiency obtained due to the socio-psychological factor due to the  $i$ -th factor of production, technical, organizational or social nature;

$n$  – number of factors.

Each of the components of the indices with its quantitative value indicates the positivity or negativity of change. If the changes are positive, the value of the index will be greater than one, if the changes are negative, their value will be less than one. The product of these indices will be an integrated assessment of changes caused by the total of all selected components.

It should be noted that the proposed index of assessing the effectiveness of structural changes at the regional level covers a wide range of its constituent elements, but can not fully assess all the effects of development and the different direction of the whole range of growth factors in the long run.

According to scientists [MAKSYMOW V., 2000; PYSMAK V., 2000], regional development depends on a more complex system of interdependent factors, among which territorial location and highly qualified personnel play an important, but not exclusive role. In addition, neither the sectoral structure nor the availability of new high-tech industries fully determine the economic growth of industrial enterprises in the region.

A comprehensive system approach to assessing the effectiveness of integrated growth of system-forming industrial enterprises in the region requires the study of cluster theory and development based on a strategy of sustainable regional development within specific territorial economic complexes based on the Concept of Sustainable Development.

## **Conclusions and recommendations**

Having studied the main theoretical and methodological provisions for assessing the effectiveness of structural changes at the regional level, taking into account the principles of the Concept of Sustainable Development, we can make some generalizations and conclusions.

Traditional methods of determining the effectiveness of the development of system-forming enterprises at the regional level, primarily the number of products that reflect the increase and services, do not allow to fully assess the actual and projected changes in the chain of increasing effects from existing technologies and new products, first of all, to save resources and individualize both production and consumption.

The effectiveness of the proposed strategy of integrated industrial growth involves radical modernization of the production apparatus of traditional system-forming industries based on the latest technology, resulting in supplies to other industries transferred part of the economic effect obtained in basic industries, i.e., somewhat improved structural proportions.

Implementation of the strategy of integrated growth of industry in the region requires a software method of solving development problems in the long run, because the basic industries, as well as individual areas, are most vulnerable to depressive processes and need

structural adjustment, the main purpose of which is to define and implement a crisis system and the formation of an efficient economy.

The effectiveness of the strategy of integrated long-term sustainable growth is expressed through the level of achievement of economic and social development goals and is the sum of economic, scientific and technical, social and environmental effects.

Uncertainty of the basic concept of the effectiveness of structural change requires the introduction into scientific circulation of a new term, "functional efficiency of development", which can be understood as a set of effectiveness of specific methods and techniques aimed at structural change and directly dependent on certain management functions.

Further research to assess the effectiveness of structural changes in the economic system of the regional level should focus on practical testing of theoretical and methodological results obtained at this stage of scientific research, the formation of an appropriate analytical basis based on monitoring the regional development.

The next stage should be the development of a multifactor multivariate economic-mathematical model for evaluating the results and making forecasts of the level of efficiency of regional development in the long run on the basis of the Concept of Sustainable Development.

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