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Assessment of structural changes in stable development of the country

■ **Abstract.** The issue of structural changes is poorly researched and unresolved in the assessment of sustainable development in the countries of the world and remains relevant for many years. The purpose of the article was to clarify the content of the issue of structural changes and justify the method of assessing the structural dynamics of the country's stable development to ensure its objectivity and reliability. To achieve the goal, an abstract-logical method was used to determine the degree of solving the problem of assessing structural changes in the stable development of countries and to develop a structural dynamic benchmark. The method of constructing an integral key figure of structural dynamics was used to determine the level of a country's stable development using the example of Ukraine. The regression analysis was used to determine the dependence of the structural dynamics of stable development on main factors. It was found that the results of the structural dynamics assessment of the stable development depend on the structural dynamic

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benchmark, as the state is compared with it. This structural dynamic benchmark of the stable development of countries is the main assessment tool. The new structural dynamic benchmark for the stable development of developing countries is substantiated. In the calculation of the integral key figure of the structural dynamics of stable development, the base rates of macroeconomic key figures that reflect this development were used. It is proposed to determine the factors influencing the integral key figure of the structural dynamics of stable development. The range of [0.28; 0.35] represents the low level of structural dynamics in Ukraine's stable development. The practical value of the proposed approach to structural change assessment in the country's stable development lies in the possibility of rapid diagnosis and monitoring of these changes for early correction of the negative consequences of phenomena that slow down development

■ **Keywords:** sustainable development; structural dynamic benchmark; macroeconomic key figures; integral key figure; determination of influencing factors

■ INTRODUCTION

The main programme of human development formulated by the United Nations is sustainable development. In the concept of sustainable development, economic growth, material production, and consumption in a healthy environment are connected with the possibility of economic system self-renewal without harming people's livelihoods in the future. It was clearly defined by the Brundtland Commission that sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs (World economic situation…, 2024). Therefore, the problems of sustainable development remain relevant, and methods of solving them need to be improved. The latest publications for 2023 and 2024, which explore various issues of sustainable development that continue classical views and approaches to considering this phenomenon, are as follows.

The Y. Kharazishvili *et al.* (2023) research analysed and suggested using traditional macroeconomic key figures of aggregate demand and aggregate supply for the formation of institutional measures of market equilibrium to achieve stable development of macroeconomic processes, taking into account the phenomena of corruption, the increase in the activity of innovative processes, a decrease in imports, and an increase in exports and investments. The positive conclusion of the authors is the provided models of sustainable development of the economy at the macroeconomic level for European Community member states. Since sustainable development is a complex and compound phenomenon that requires monitoring of influencing factors, P. Paridhi & R. Ritika (2024) consider issues that hinder the transparency of the perception of its reporting. They emphasise that the measurement of key figures provides useful quantitative information for assessing the risks accompanying sustainable development at the macroeconomic level. However, the article does not provide algorithms for evaluating development results and adequate mathematical models.

Sustainable development at the macroeconomic level is possible on the basis of achieving economic security, which in the context of sustainable development is discussed in the article by G. Mazhara *et al.* (2023), which provides results of forecasting macroeconomic key figures of the functioning of the Ukrainian economy in the conditions of war according to the scenario approach. At the same time, none of the developed forecasts characterises the state of the macroeconomic security level as optimal, taking into account the structural changes in the branches of the Ukrainian economy, which are inherent in the modern complex war-time conditions of business entities and industries' activity.

While previous authors considered sustainable development at the macroeconomic level as a holistic phenomenon, many researchers analyse and develop proposals considering its individual features, taking into account the business conduct in certain countries and certain functional aspects. An important aspect of development in modern conditions is its financing, proposals for which are outlined, for example, in a study by C.E. Anton *et al.* (2024). This scientific work provides an in-depth analysis of financing sources and access to them in the context of sustainable development and analyses the prospects and intentions of entrepreneurs regarding the use of such sources in the future. It would be expedient to substantiate proposals for financing structural shifts between economic sectors.

Summarising the above publications on the problem of sustainable economic development, it can be concluded that, in general, this phenomenon arouses the increased interest of researchers in the general definition of analytical methods, tools, and specific aspects of its components, functional directions, and features of manifestation in certain parts of the world and countries. However, what remains unresolved is the issue of the composition of the key figure system for measuring development as not only stable but also sustainable, which differs by taking into account structural economic shifts, for which it is necessary to justify the system of key figures, the benchmark of their measurement. Therefore, the purpose of the conducted research was to formulate and solve the issue of structural dynamics of the stable development of countries, to develop a method of its assessment, and to substantiate the structural dynamic benchmark of the stable development of developing countries.

■ MATERIALS AND METHODS

In order to carry out the choice of methods and justification of tools, it should be borne in mind that sustainable development is defined as systematically managed development and is carried out according to 17 goals. Monitoring of the implementation of sustainable development goals is carried out according to 183 national indicators. It should be noted that a large number of indicators cause many problems, namely: it is difficult to organise an information collection system; an unambiguous definition of individual indicators; problems in aggregating indicators that are structured by components; lack of assessment of

the structural dynamics of stable development. It should also be noted that stability is a defining characteristic of sustainable development, but this development is not the same as stable development. Stable development is manifested in the adaptation to various force majeure circumstances, the resistance of the socio-economic-ecological system to destabilising factors, and the ability to dynamically change structurally to achieve set development goals. In view of these issues, for the objectivity of the comparative assessment of the stable development of countries, it is advisable to limit the number of indicators for each of the components and use a method that complements the quantitative assessment obtained on the basis of the aggregation of indicator values. This method reflects not only the increase in the size of the components, but also the change in their qualitative content, the dynamics of structural changes. The method of assessing the dynamics of structural changes in a stable development involves the analysis of a dynamic series of key figures reflecting its elemental state and the substantiation of the reference ratio of the order of rates of their changes. The need to assess

the structural dynamics of stable development is explained by the fact that this development is ensured not only by the growth of components but also by a change in their qualitative content, the dynamics of structural changes.

To determine the assessment of the dynamics of structural changes in stable development, one should analyse the dynamic series of key figures that reflect its elemental state and justify the reference ratio of the order of rates of their changes. By comparing two rankings – actual and benchmark – consistency in the structural dynamics of stable development can be achieved. The integral coefficient is calculated based on the Spearman and Kendell rank correlation coefficients. Spearman's rank correlation coefficient is based on deviations or rank differences, and Kendall's coefficient is based on rank inversions. It is believed that the evaluation based on deviations characterises the volumetric side of the movement, and the evaluation based on inversions reflects structural dynamics (Malyarets *et al.*, 2019). Therefore, the method for assessing the dynamics of structural changes in stable development was implemented according to the algorithm presented in Table 1.

Table 1. An algorithm of the method for assessing the dynamics
of structural changes in stable development of the country

No.	Stage name	Stage contents
1	Formation of a partial key figure system for the assessment of stable development.	Theoretical and economic analysis. Matrix formation: $$X = (x_{ij})_{m \times n}, \qquad (1)$$ where X – matrix of key figure values of economic stability for the corresponding period of time; x_{ij} – the value of the i-th key figure in j-th time period; m – the number of key figures reflecting the structure of the export-import potential; n – the number of periods during which the analysis is carried out.
2	Justification of the dynamic structural benchmark.	Theoretical and economic analysis.
3	Calculation of basis rates in changes of key figure values in the system.	$$IX = (ix_{ij})_{m \times (n-1)}, \qquad (2)$$ where IX – the matrix of basis rates of key figure values; ix_{ij} – basis rates of the i-th key figure.
4	Setting the ranks of key figures in each time period according to the change rate of key figure values in the system.	$$P = (p_{ij})_{m \times (n-1)}, \qquad (3)$$ where P – the rank matrix of basis rates of key figures; p_{ij} – key figure rank.
5	Calculation of paired rank correlation coefficients.	Spearman's coefficient: $$r_{c\,j}(r_{c\,j} = 1 - \frac{6\sum_{i=1}^{n} d_{ij}}{m(m^2-1)}, \text{where } d_{ij} = p_{ij} - e_i), \qquad (4)$$ where e_i – the rank of the i-th key figure in a benchmark. Kendell's coefficient: $$r_{\tau\,j}\,(r_{\tau\,j} = 1 - \frac{4\sum_{i=1}^{n} s_{ij}}{m(m-1)}), \qquad (5)$$ where s_{ij} – the number of inversions for the i-th key figure of the real state of the key figure system with its dynamic structural benchmark.
6	Calculation of an integral key figure of the structural dynamics of stable development.	$$I_{s\,j} = \frac{(1+r_{c\,j})(1+r_{\tau\,j})}{4}, \qquad (6)$$ where I_{sj} – is the value of the integral indicator of the structural dynamics of sustainable development in the j-th period of time.
7	Determining the consistency of change rates for key figures using the concordance coefficient according to the formula.	$$W = \frac{12 \times S}{n^2(m^3-m)}, \qquad (7)$$ where W – the concordance coefficient value; $S = \sum_{i=1}^{m}\left(\sum_{j=1}^{n} p_{ij} - n \times \frac{m+1}{2}\right)$.
8	Determining the influence of factors on the structural dynamics of stable development.	Paired regression dependencies.

Source: the authors' improvement of the method described in L.M. Malyarets *et al.* (2019)

The value of the integral key figure of structural changes in the country's stable development belongs to the interval [0,1] and is interpreted as follows: the closer the calculated key figure value is to 1, the more the structure of the country's stable development in the *j*-th time period corresponds to the benchmark.

■ RESULTS

A great contribution to the formation of sustainable development theory was made by such famous development researchers as J. Butlin (1989), H.E. Daly (1991), N. Georgescu-Roegen (2011) and many others. Depending on professional interests, researchers pay attention to the development of narrow issues for explaining the results of its implementation. Thus, academic economists in their research paid more attention to well-being, profit, and capital accumulation. Ecologists mostly focused their attention on environmental assessment. Scientific geographers studied sustainable development in land use planning. But many scientific problems in the study of sustainable development, such as structural shifts in the branches of the country's economy and global economic relations, remained outside the attention of scientists. According to the United Nations, there are about 1,348 publications dedicated to the discussion of sustainable development issues (The 17 goals, n.d.).

It should be noted that the substantiation of the dynamic structural benchmark of stable development is an important stage on which all other stages depend (Kolodiziev *et al.*, 2017). The dynamic structural benchmark of stable development is a management tool for evaluation, as the state of this development is compared with it. The results depend on this tool in the method of assessing the dynamics of structural changes in stable development. This benchmark is proposed to be formed on the basis of the theoretical and logical analysis of scientists' research and to take into account the existing legislative documents. To justify the dynamic structural standard of stable development, one should use both the rating of the components of sustainable development, defined by the UN, and the existing laws in the economy regarding the relationship between change rates of key figures. However, regarding the relationship between key figure change rates in the system, A.O. Melnyk (2014) believes that there should be such a subordination: the change rate of the average salary (T_{as}) should be less than the change rate of the volume of industrial products sold (T_{is}) and, accordingly, the change rate of nominal GDP (T_{NGDP}). Only under such conditions will there be an increase in the change rate of direct investment in Ukraine (T_i) (Bogolyubov *et al.*, 2018):

$$T_i > T_{NGDP} > T_{is} > T_{as} > 100\%. \qquad (8)$$

It should be noted that many scientists studying development issues recommend the relationship between change rates of economic indicators, which reflects the dynamics of structural changes. Scientist A.S. Galchynskyi (2009) also investigated the relationship between key figure change rates, considering the causes of world development crises. He believes that the low change rates in the volume of sold products affect the decrease in the export of goods and services and the increase in imports, and recommends increasing change rates in the volume of sold products (T_{ri}) over change rates in exports (T_e) and imports of goods and services (T_{igs}) and change rates of a country's public debt (T_{crp}):

$$T_{ri} > T_{crp} > T_e > T_{igs} > 100\%. \qquad (9)$$

The famous scientist S.K. Ramazanov *et al.* (2012) claims that the appropriate ratio of key figure change rates for the development of the country is as follows:

$$T_i > T_{NGDP} > T_{ip} > T_{cpd} > 100\%, \qquad (10)$$

where T_i – change rates of direct investments; T_{NGDP} – change rates of the nominal GDP; T_{ip} – change rates of the volume of sold industrial products; T_{cpd} – change rates of a country's public debt. There are well-known justifications for the economic stability benchmark of the macroeconomic system, where the following benchmark of the ratio between key figure change rates is proposed (Malyarets *et al.*, 2019):

$$Q_i > Q_{NGDP} > Q_{sip} > Q_{cg} > Q_{cpd} > Q_e > Q_{im} > Q_{as} > Q_{sa} > Q_{ul}, \qquad (11)$$

where Q_i – growth rate of direct investments; Q_{NGDP} – growth rate of the nominal GDP; Q_{sip} – growth rate of the volume of industrial products sold; Q_{cg} – growth rates of a country's gold and foreign currency reserves; Q_{cpd} – growth rates of a country's public debt; Q_e – growth rates of goods and services exported; Q_{im} – growth rates of goods and services imported; Q_{as} – growth rates of the average salary; Q_{sa} – growth rates of salary arrears; Q_{ul} – growth rates of the unemployment level. One can continue citing the opinions of scientists regarding the key figure change rate relation in the economy, but when summarising them, it is recommended to use the structural dynamic benchmark of the country's stable development, which is provided in Table 2. The method of assessing the dynamics of structural changes in stable development involves the calculation of an integral key figure that uses the basis rates of partial key figures (Fig. 1).

Table 2. Structural dynamic benchmark of country's stable development

No.	Growth rates of macroeconomic key figures	The rank of the key figure basis rate in the benchmark
1	Growth rates of Nominal GDP of Ukraine per capita, USD (IX1)	1
2	Growth rates of Gross foreign debt, million USD (IX2)	2
3	Growth rates of Average salary per full-time employee, UAH (IX3)	3
4	Growth rates of Current expenses for environmental protection, thousand UAH (IX4)	4
5	Growth rates of Economically active population aged 15-70, in total, thousand persons (IX5)	5
6	Growth rates of Registered unemployed, thousand persons (IX6)	6
7	Growth rates of Volume of sold industrial products (goods, services), million UAH (IX7)	7
8	Growth rates of Export of goods, million USD (IX8)	8

No.	Growth rates of macroeconomic key figures	The rank of the key figure basis rate in the benchmark
9	Growth rates of Import of goods, million USD (IX9)	9
10	Growth rates of Net international investment position, million USD (IX10)	10

Source: calculated by the authors based on State Statistics Service of Ukraine (n.d.)
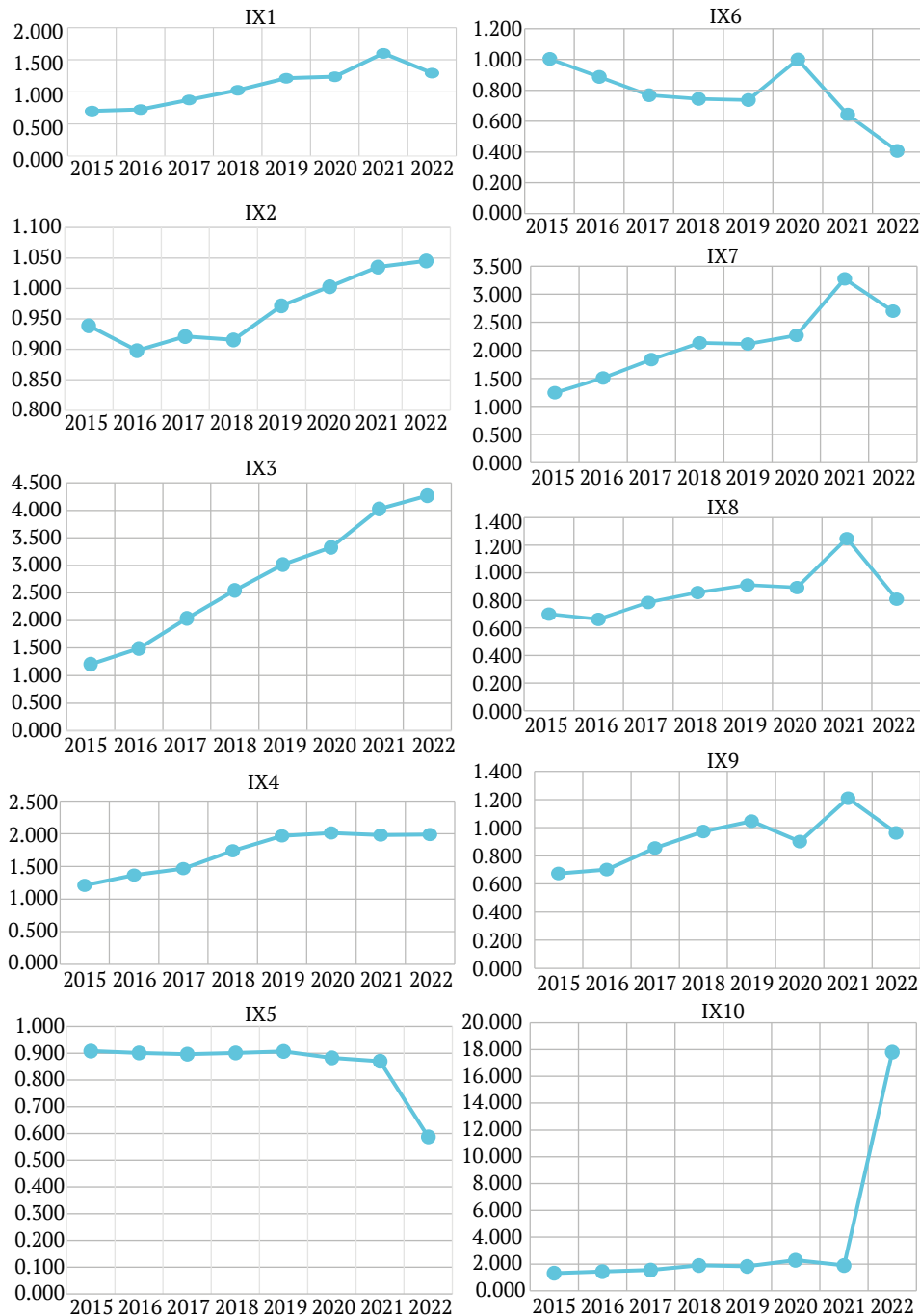

Figure 1. Key figure basis rates of the structural dynamic benchmark of stable development of Ukraine

Note: IX1 – the basis rate of the nominal GDP of Ukraine per capita; IX2 – the basis rate of the gross foreign debt; IX3 – the basis rate of the average salary per full-time employee; IX4 – the basis rate of the current expenses for environmental protection; IX5 – the basis rate of the economically active population aged 15-70; IX6 – the basis rate of the registered unemployed persons; IX7 – the basis rate of the volume of sold industrial products (goods, services); IX8 – the basis rate of the export of goods; IX9 – the basis rate of the import of goods; IX10 – the basis rate of the net international investment position

Source: made by the authors based on Macroeconomic indicators (n.d.)

The analysis of Figure 1 shows that there is a different trend in the key figure basis rates of the structural dynamic benchmark of stable development. As a result of the implementation of the proposed algorithm for the method of assessing the dynamics of structural changes in the country's stable development, the value of the integral key figure was obtained, the dynamics of which are shown in Figure 2.
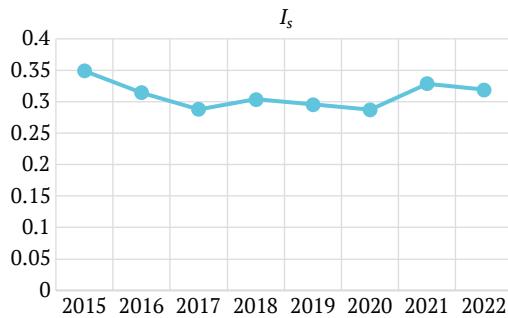

Figure 2. The value of the integral key figure
of the structural dynamics
of stable development of Ukraine

Note: I_s – integral key figure value of the stable development structural dynamics
Source: made by the authors

As shown in Figure 2, the levels of structural dynamics are not high; therefore, the ratio of key figure change rates for stable development in Ukraine should be managed. At the same time, the concordance coefficient is equal to 0.4423, which also indicates a low level of consistency of key figure change rates in the system. An integral key figure value of the structural dynamics of the stable development of Ukraine varies from 0.287 to 0.349, that is, in the interval [0.28; 0.35], which is low and requires urgent development of management measures to correct this situation. To determine directions of influence on the ratio of key figure change rates of stable development, it is recommended to calculate the dependence of the integral key figure of structural dynamics on the specified partial key figures. At the same time, R^2 coefficients of determination were calculated:

$$I_s = \sqrt{0.083 + \frac{0.014}{IX1}}, R^2 = 0.892;$$

$$I_s = \sqrt{0.123 - \frac{0.025}{IX2}}, R^2 = 0.012;$$

$$I_s = \sqrt{0.084 + \frac{0.03}{IX3}}, R^2 = 0.619;$$

$$I_s = \sqrt{0.067 + \frac{0.05}{IX4}}, R^2 = 0.719;$$

$$I_s = \frac{1}{3.455 - \frac{0.187}{IX5}}, R^2 = 0.037;$$

$$I_s = \frac{1}{3.327 - \frac{0.068}{IX6}}, R^2 = 0.0217;$$

$$I_s = \sqrt{0.081 + \frac{0.03}{IX7}}, R^2 = 0.137;$$

$$I_s = \sqrt{0.085 + \frac{0.009}{IX8}}, R^2 = 0.723;$$

$$I_s = \sqrt{0.073 + \frac{0.021}{IX9}}, R^2 = 0.117;$$

$$I_s = \sqrt{0.092 + \frac{0.01}{IX10}}, R^2 = 0.024.$$

The equation of the dependence of the integral key figure of structural dynamics on the specified partial key figures, which are accompanied by a coefficient of determination greater than 0.6, indicates an effective way to change the structure of stable development and increase its overall level. In these studies, the level of structural dynamics of Ukraine's stable development is influenced by Ukraine's nominal GDP per capita, the average salary per full-time employee, current costs for environmental protection, and the export of goods. Changing the rate of determined influencing factors will have an effective influence on structural changes and, as a result, will affect the increase in the level of stable development in the country.

Thus, the country's stable development is conditioned by the appropriate structural dynamics, the benchmark of which should be justified on the basis of current national conditions and taking into account the global Stable Development Program. In assessing structural changes in the country's stable development, it is necessary to rely on its 17 goals, which are determined by the appropriate system of indicators. To carry out the assessment, it is advisable to use the proposed algorithm for assessing structural changes in the stable development of the country. It is recommended to substantiate the structural dynamic benchmark of a country's stable development, taking into account the rating of goals and recommendations of leading scientists and practitioners regarding the ratio of change rates in macroeconomic key figures.

■ DISCUSSION

The proposed approach is of great importance in practical activities as it allows for the express diagnosis and monitoring of structural changes in stable development over time. The assessment of structural changes in the country's stable development, which is carried out on the proposed basis, differs in objectivity, reliability, and scientific reasonableness. The results of the conducted research are significantly different from the existing ones, despite the existing positive achievements in solving this issue.

The need to improve individual development measurement indicators is evidenced by X. Zhao *et al.* (2024), who examined the impact of natural resource extraction on the ecological state of the environment and population health using the example of the United States of America for 32 consecutive years until 2022. The authors suggest creating green and blue natural centres and reducing the greenhouse effect in order to achieve sustainable economic development. The authors' proposals are correct, but it would be advisable to more clearly indicate the composition of the indicator system for measuring stable and sustainable development by taking into account the proposed factors. Proposals for combining several important indicators for assessing sustainable development at the macroeconomic level are outlined in the article by D. Weng & Q. Xia (2023), where the authors continue the theme of preserving natural resources, promoting the development of human resources,

and using financial sources for these purposes. The appropriate proposal of the authors is the use of inclusive financial resources to achieve the specified goals. However, it would be advisable to more clearly indicate the key figures that the authors propose to measure the level of stable and sustainable economic development at the macroeconomic level.

The issues of analytical support, analytical tools in the study of sustainable development processes are given attention in a study by S. Proença & E. Soukiazis (2023), where authors emphasise such a phenomenon as entrepreneurship and its importance for achieving sustainable development through the economical use of natural resources for economic growth, taking into account innovations and achieving social justice in society. It would also be appropriate to offer partial and integral key figures according to the measures indicated in the article. An analytical toolkit for determining the level of sustainable development is proposed by R. Wang *et al.* (2023) to measure the connection between macroeconomic key figures of sustainable development and the active use of renewable energy as the main modern economic resource. Also, the authors investigated the impact of technical innovations on economic development. The authors investigate technical innovations and develop measures to achieve sustainable development, taking into account the listed factors. Their proposals are correct, but the work does not clearly specify the key figures calculation sequence, which complicates their practical use for determining general indicators of sustainable economic development.

Sustainable development is impossible without taking into account changes in human capital. That is why some scientists, like Z. Tokhtyyeva *et al.* (2024), pay considerable attention to it as the most important development factor, using the example of its newest direction, the green economy in Asia. The results of the article are justified, but it would be appropriate to develop these studies from the standpoint of measuring structural shifts in human capital as a factor of sustainable development, which turns it into a stable one. Proposals for the use of human capital in Latin America are presented by A. López-Concepción *et al.* (2024). This study examines human capital from the perspective of the formation of labour values in Latin America and the interaction between socio-demographic characteristics and well-being. It would be appropriate to develop models for other regions of the world economy, which would prove their typicality and substantial practical significance.

Covering the research of scientists A. Kazemikhasragh & M.V. Buoni Pineda (2023) from different countries of the world, for example, in West Africa, it is appropriate to note the effect of certain factors that concern the population of these continents. Thus, researchers from West African countries conducted in-depth studies of poverty factors, the state of the oil and petroleum products markets, and the volume of tourist flows. And the increase in health care costs will contribute to positive changes in the trends of sustainable development, which should be taken into account in accordance with the deterioration of the global epidemiological situation. The publication by H. Bartelings & G. Philippidis (2024) sets out proposals related to a separate development goal set by the UN: the use of food products and food waste. Such proposals regarding the developed scenarios for achieving the development goal related to the specific consumption of food products and waste will contribute to the improvement of the quality of working life and the professional development of employees. However, the authors do not propose specific programmes for retraining workers, and this makes it difficult to achieve the development goal of providing food products to improve the quality of life of the population.

The level of population development should primarily contribute to the growth of sustainable economic development in countries. J. Pokorný & A. Palacká (2023) wrote about it and proved it on the built correlation and regression models. Sustainable economic development was analysed in accordance with the needs of A. Maslow's pyramid and the growth curve of S. Kuznets. The authors proved that the main key figures affecting sustainable development are the state of the labour market, wages on the labour market, its equality between women and men, as well as the workers' health state. The proposals of scientists are well-founded and can be applied to the analysis of key figures in the sustainable and stable development of countries.

Thus, the given results of the scientists' research indicate their difference from the results of the research presented in the article. Scientists mainly focus their attention on the inclusion and definition of one or another characteristic of the country's stable development, but none of them mentions the structure of this development in terms of dynamics or the influence of relevant factors on the level of development. The advantage of this approach is the possibility of effective control of stable development based on adjusting the dynamics of structural changes.

■ CONCLUSIONS

The following results were obtained in the study. The expediency of distinguishing the concepts of "sustainable development" and "stable development" was established. The necessity of managing structural changes for the stable development of the country is substantiated. It is established that, in order to manage stable development, the structural changes of this development should be evaluated. The algorithm of the method of assessing the dynamics of structural changes in the country's stable development based on the calculation of the influence of factors on the structural dynamics of the country's stable development has been improved. The influence of factors on the structural dynamics of the country's stable development is often non-linear. What is new is a well-grounded dynamic structural benchmark for the stable development of developing countries. In the process of substantiating the dynamic structural benchmark of stable development, it is necessary to take into account the current national conditions of the country's economy and the global Stable Development Programme.

The proposed appropriate number of key figures in the dynamic structural benchmark of a country's stable development – ten main macroeconomic key figures. The proposed list of macroeconomic key figures in the dynamic structural benchmark of the country's stable development, namely: Nominal GDP of Ukraine per capita; Gross foreign debt; Average salary per full-time employee; Current expenses for environmental protection; Economically active population aged 15-70, in total, thousand persons; Registered unemployed; Volume of sold industrial products (goods, services); Export of goods; Import of goods;

Net international investment position. The level of structural dynamics of stable development in Ukraine is low; it varies in the interval [0.28; 0.35]. In Ukraine, in order to ensure stable development, it is urgently necessary to develop management measures to adjust the change rates of relevant macroeconomic key figures. Further research into issues of assessing the stable development of countries is needed to determine their general level, taking into account both qualitative and quantitative structural changes, as well as identifying their benchmark tolerance values.

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◼ CONFLICT OF INTEREST
None.

◼ REFERENCES

[1] Anton, C.E., Zamfirache, A., Albu, R.-G., Suciu, T., Sofian, S.M., & Ghiţă-Pîrnuţă, O.A. (2024). Sustainable entrepreneurship: Romanian entrepreneurs' funding sources in the present-day context of sustainability. *Sustainability*, 16(2), article number 654. doi: 10.3390/su16020654.

[2] Bartelings, H., & Philippidis, G. (2024). A novel macroeconomic modelling assessment of food loss and waste in the EU: An application to the sustainable development goal of halving household food waste. *Sustainable Production and Consumption*, 45, 567-581. doi: 10.1016/j.spc.2024.01.025.

[3] Bogolyubov, V. (Ed.). (2018). *Sustainable development strategy*. (2nd ed.). Kyiv: National University of Life and Environmental Sciences of Ukraine.

[4] Butlin, J. (1989). Our common future. *Journal of International Development*, 1(2), 284-287. doi: 10.1002/jid.3380010208.

[5] Daly, H.E. (1991). Sustainable development: From concept and theory towards operational principles. *Population and Development Review*, 16, 25-43. doi: 10.2307/2808061.

[6] Galchynsky, A.S. (2009). *Crises and cycles of world development*. Kyiv: ADEF-Ukraine.

[7] Georgescu-Roegen, N. (2011). *From bioeconomics to degrowth*. London: Taylor & Francis. doi: 10.4324/9780203830413.

[8] Kazemikhasragh, A., & Buoni Pineda, M.V. (2023). Fiscal space policies for sustainable development and debt relief: Empirical analysis in West African countries. *New Global Studies*, 17(1), 1-16. doi: 10.1515/ngs-2021-0040.

[9] Kharazishvili, Y., Lyashenko, V., Grishnova, O., Hutsaliuk, O., Petrova, I., & Kalinin, O. (2023). Modeling of priority institutional measures to overcome threats to sustainable development of the region. *IOP Conference Series: Earth and Environmental Science*, 1269(1), article number 012023. doi: 10.1088/1755-1315/1269/1/012023.

[10] Kolodiziev, O., Tyschenko, V., & Azizova, K. (2017). Project finance risk management for public-private partnership. *Investment Management and Financial Innovations*, 14(4), 171-180. doi: 10.21511/imfi.14(4).2017.14.

[11] López-Concepción, A., Gil-Lacruz, A.I., Saz-Gil, I., Garcia-Madurga, M.Á., & Sánchez-Medalón, I. (2024). What are the factors that most influence the formation of workers' labor values in order to achieve sustainable development in Latin America? *Business Strategy and the Environment*. doi: 10.1002/bse.3737.

[12] Macroeconomic indicators. (n.d.). Retrieved from https://bank.gov.ua/ua/statistic/macro-indicators.

[13] Malyarets, L.M., Barannik, I.O., Sabadash, L.O., & Grynko, P.O. (2019). Modeling the economic sustainability of the macro system (for example Ukraine). *Montenegrin Journal of Economic*, 14(3), 23-35. doi: 10.14254/1800-5845/2019.15-3.2.

[14] Mazhara, G., Pyshnograiev, I., & Zavalna, M. (2023). Scenario modeling of the critical macroeconomic and sustainable development indicators of Ukraine. *E3S Web of Conferences*, 408, article number 01019. doi: 10.1051/e3sconf/202340801019.

[15] Melnyk, A.O. (2014). *World economic crisis: Theory and methodology*. Kyiv: Institute of Agrarian Economics.

[16] Paridhi, P., & Ritika, R. (2024). Sustainability reporting for boosting national commitment and overcoming challenges: A hierarchical model. *Business Strategy & Development*, 7(1), article number e334. doi: 10.1002/bsd2.334.

[17] Pokorný, J., & Palacká, A. (2023). Well-being as a prerequisite for sustainability on a macroeconomic scale? Case of V4 countries. *Quality Innovation Prosperity*, 27(3), 141-153. doi: 10.12776/QIP.V27I3.1945.

[18] Proença, S., & Soukiazis, E. (2023). The process of sustainable entrepreneurship: A multi-country analysis. *Environment, Development and Sustainability*, 25, 10995-11010. doi: 10.1007/s10668-022-02515-z.

[19] Ramazanov, S.K., Burbelo, O.A., & Vitlinskyi, V.V. (2012). *Risks, security, crises and sustainable development in the economy. Methodologies, models, decision-making and management methods*. Luhansk: Knowledge.

[20] State Statistics Service of Ukraine. (n.d.). Retrieved from https://www.ukrstat.gov.ua/.

[21] The 17 goals. (n.d.). Retrieved from https://sdgs.un.org/goals.

[22] Tokhtyyeva, Z., Kurbanova, I., Abdyzhusupova, A., & Savin, V. (2024). The human factor in the development of a green economy in the Kyrgyz Republic. *BIO Web of Conferences*, 83, article number 07003. doi: 10.1051/bioconf/20248307003.

[23] Wang, R., Laila, U., Nazir, R., & Hao, X. (2023). Unleashing the influence of industrialization and trade openness on renewable energy intensity using path model analysis: A roadmap towards sustainable development. *Renewable Energy*, 202, 280-288. doi: 10.1016/j.renene.2022.11.035.

[24] Weng, D., & Xia, Q. (2023). Nexus between financial inclusion and natural resource management: How human development affects the sustainability practices. *Geological Journal*, 58(12), 4596-4609. doi: 10.1002/gj.4862.

[25] World economic situation and prospects as of mid-2024. (2024). Retrieved from https://www.un.org/development/desa/dpad/publication/world-economic-situation-and-prospects-as-of-mid-2024/.

[26] Zhao, X., Gao, Y., Hou, Y., Albasher, G., & Bu, F. (2024). Addressing the resource curse: Empirical analysis of greenhouse gas mitigation strategies for sustainable development. *Resources Policy*, 88, article number 104454. doi: 10.1016/j.resourpol.2023.104454.

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Оцінка структурних змін стійкого розвитку країни

■ **Анотація.** Проблема структурних змін є погано дослідженою та невирішеною в оцінці сталого розвитку країн світу й залишається актуальною багато років. Метою статті було уточнення змісту проблеми структурних змін, обґрунтування методу оцінки структурної динаміки стійкого розвитку країни для забезпечення її об'єктивності та достовірності. Для досягнення мети було використано абстрактно-логічний метод – для визначення ступеня вирішення проблеми оцінки структурних змін стійкого розвитку країн та для розроблення структурного динамічного еталону. Метод побудови інтегрального показника структурної динаміки – для визначення рівня стійкого розвитку країни на прикладі України. Регресійний аналіз – для визначення залежності структурної динаміки стійкого розвитку від основних факторів. Виявлено, що результати оцінки структурної динаміки стійкого розвитку залежать від структурного динамічного еталону, оскільки з ним порівнюється стан. Цей структурний динамічний еталон стійкого розвитку країн є основним інструментом здійснення оцінки. Обґрунтовано новий структурний динамічний еталон стійкого розвитку країн, які розвиваються. В обчисленні інтегрального показника структурної динаміки стійкого розвитку були використані базисні темпи макроекономічних показників, які відображають цей розвиток. Запропоновано визначати фактори впливу на інтегральний показник структурної динаміки стійкого розвитку. Діапазон [0,28; 0,35] відображає низький рівень структурної динаміки стабільного розвитку України. Практичне значення запропонованого підходу до оцінки структурних змін стійкого розвитку країни полягає у можливості здійснювати експрес-діагностику та моніторинг цих змін для завчасного коригування негативних наслідків явищ, які сповільнюють розвиток

■ **Ключові слова:** сталий розвиток; структурний динамічний еталон; макроекономічні показники; інтегральний показник; визначення факторів впливу