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Integration of statistical data in the comprehensive economic statistics system

Abstract. Modern society represents a complex socio-economic system, the development efficiency of which is determined by the economy's ability to maintain the stability of its elements over certain periods of time. The aim was to justify an integrative approach to the development of comprehensive economic statistics in the context of sustainable development by identifying systemic contradictions, assessing the consistency of statistical data, and determining directions for their harmonisation in accordance with the Sustainable Development Goals. The study utilised a set of general scientific and specialised methods, including: the analytical generalisation method – for identifying systemic problems in comprehensive economic statistics; comparative analysis – for evaluating data collection schemes and data reconciliation; systems approach – for forming an integrated view of statistics; structural-functional analysis – for determining the role of metadata; logical modelling – for constructing schemes of interrelations between the indicators of Sustainable Development Goals and statistical processes. It was established that the modern socio-economic system is characterised by instability and limited ability to restore equilibrium, which necessitates the integration of statistical systems. It is substantiated that the balance of components of sustainable development is achieved through the coordinated functioning of comprehensive economic statistics. Basic contradictions in accounting practice have been identified, as well as dependencies between sources of statistical errors and the methods used to correct them. The double effect of harmonising public finance data with international standards has been demonstrated. A general scheme of the interconnection between the issues of economic indicators of sustainable development and the directions for improving statistical work has been developed. The role of metadata in ensuring the integration of statistical systems and the inclusion of digital indicators into macroeconomic assessments has been identified. The practical significance of the obtained results lies in their potential to improve the consistency of statistical data, ensure international comparability, and substantiate managerial decisions at the national level within the context of implementing the Sustainable Development Goals

Keywords: sustainable development; integration; analytical assessment; comprehensive economic statistics; data consistency; types of metadata; comparative evaluation

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INTRODUCTION

The modern process of global economic development is characterised by complex interactions among national economies. In the process of forming a single economic space, interconnections among financial systems, international trade, and technological development have deepened, necessitating a qualitatively new level of statistical support for the state and the economy's development. The world economy is experiencing contradictory, slow economic growth. According to estimates by international organisations, including the World Bank (2019), IMF (2024), and the United Nations (n.d.), the growth rate of global GDP for 2024-2025 has been reduced to the level of 2008, and the medium-term forecast remains lower than before 2019. This situation exacerbates the problem of adequately measuring and interpreting macroeconomic processes at both the national and global levels. While deepening global interconnections requires a coherent statistical framework to form a single conceptual framework for analytical work, the slowdown and heterogeneity of growth make it critical to identify structural shifts, risks, and vulnerabilities using reliable data. Avoiding fragmentation of analytical work and the tendency to errors due to inconsistencies between sources ensures the integration process. The new demands of digital society exacerbate existing challenges in analytical work across all research fields, particularly in assessing the quality of source data, preventing errors during processing, and avoiding incorrect conclusions. They also require changes in the structure and methods of statistical work, mainly by shifting how economic data is collected. Therefore, preparing profile statistical data as the basis for current integration processes, grounded in general principles such as the use of core concepts, definitions, assessment methods, and data sources for the most accurate evaluation of sustainable development, remains essential.

J. Zwijnenburg (2026) describes the system of national accounts (SNA) as an international standard for compiling macroeconomic statistics, encompassing a set of interrelated tables that provide an overview of a country's economy. Using the GDP indicator in the SNA as a measure of social progress or the population's economic well-being reveals its limitations as a tool for assessing overall well-being. S. Liu (2023) proposed considering statistics as a tool for achieving the Sustainable Development Goals (SDGs) and their components, while emphasising unresolved statistical problems that hinder effective achievement of the SDGs: incompatibility between the SDGs and statistical data, and inequality in the statistical potential of different countries. T. Sanseverino (2023) examined the SDGs and concluded that effectively communicating economic co-benefits through SDG references can be challenging. Low-income countries (LICs) have shown relatively little progress towards SDG 1 and SDG 8. Therefore, the economic impact of, for example, carbon projects implemented in such countries has high potential for additionality. They also require changes in the structure and methods of statistical work, mainly by shifting how economic data is collected. The study of V.Y. Khaustova *et al*. (2024) is based on determining the impact of digitalisation factors on the economic development of countries around the world using a cognitive approach. The combination of the World Rankings of Digitalisation Levels with indicators of economic development worldwide (characterising GDP, gross value added, employment, production, and trade in ICT and computer communications goods and services) was carried out using a single information base from the World Bank. To prove the need to build a comprehensive system for measuring the parameters of the digital economy and the requirements it must meet, the most important directions in developing such a system have been identified. A comparative description of the views of supporters and opponents of changing the traditional conceptual foundations for measuring economic parameters under new conditions has made it possible to identify the main problems in developing an adequate information base for constructing indicators to account for elements of the digital economy. The described changes in the formation of demand for statistical information, the proposed ways to improve interaction with users of official statistical information proved the need for unification of practices for obtaining and disseminating the results of measuring the digital economy on an international scale, and also revealed the role of international organisations in the process of optimising and standardising various processes of producing official statistics at the national and international levels.

The aim of the article was to substantiate an integrative approach as a tool for interconnection, coordination, and unification of components in the formation of the Sustainable Development Strategy (SDS) under conditions of sustainable development by identifying systemic contradictions, assessing the consistency of statistical data, and justifying directions for their harmonisation in accordance with the SDGs. To achieve the goal, the following tasks have been identified: to identify systemic issues in the consistency of the ESS; to investigate contradictions between accounting and the SNA; to assess the impact of harmonising statistical data on their consistency; to justify the role of metadata in ensuring the integration of statistical systems; to develop an analytical framework for the interrelation of SDG indicators and the comprehensive economic statistics (CES). The scientific novelty lies in developing an integrated vision of the CES by aligning economic measures of sustainable development with its fundamental characteristics. The paper substantiates the relationship between sources of statistical error and mechanisms for their correction, develops principles for data harmonisation, further clarifies the role of metadata in the context of the digitalisation of the economy, and proposes using an analytical framework as a tool for interaction between SDG indicators and statistical practice.

MATERIALS AND METHODS

In the research process, a complex of general scientific and specialised methods was used, which ensured the systematic study of the problems of statistical support for monitoring SDG indicators, the assessment of the quality of statistical data, and the substantiation of areas for improving information and analytical support. The information base of the study comprised methodological documents of international organisations containing definitions, classifications, and instructions for collecting and calculating SDG indicators; standards of official statistics; materials from national statistical services; and scientific publications

devoted to improving the sustainable development monitoring system (State Statistics Service of Ukraine, n.d.; United Nations, 2013; Nilashi *et al*., 2023).

The selection of information sources was carried out according to the principles of officiality, methodological soundness, international recognition, relevance, comparability of statistical approaches and systematicity. Such a set of sources enabled simultaneous analysis of definitions, metadata, and procedures for collecting, processing, and harmonising data (United Nations, 2008; United Nations, 2013; Eurostat, 2021).

The research was carried out sequentially in several interconnected stages. The first stage involved an analysis of international methodological documents on the organisation of statistical support for SDG monitoring and quality management of official statistics. At the second stage, a comparative study was conducted of the methodologies for developing SDG indicators, sources of statistical information, mechanisms for collecting, processing, and harmonising data, as well as the features of their information support. At the third stage, the main sources of statistical errors, risks of information inconsistencies, and problems of ensuring the comparability of indicators that form the basis of the CES and are ambiguously reflected in the SNA were identified. At the final stage, logical models were constructed that reflect the relationships between SDG indicators, statistical processes, and data quality assurance mechanisms. This sequence allowed for the combination of theoretical understanding of SDG statistics with an applied analysis of their functioning.

The method of analytical generalisations was used to critically analyse methodological provisions and identify systemic problems in the statistical support of the SDGs, relating to data quality, completeness, consistency, isolation of the significance of economic indicators, and the possibility of their international comparability. This method allowed us to move from describing individual facts in achieving the SDGs to formulating systemic patterns of interaction between the CES and the SNA, as well as problematic issues of their coherence. The comparative analysis method was used to compare methodological approaches to the formation of statistical estimates, evaluate data collection, integration, and reconciliation schemes, and identify differences between existing recommendations and possible practices for their implementation. The result of the comparative analysis was the identification of typical situations regarding the organisation of data collection, as well as the identification of inconsistencies common to different statistical systems.

The systemic approach made it possible to consider the statistical support for SDG monitoring as a holistic, multi-level system, whose elements include data sources, statistical processes, metadata, quality control mechanisms, information flows, and users of statistical information. This provided a comprehensive study of the relationships between individual components of the system and their impact on the reliability of the final statistical results. The systems approach allowed us to focus on the relationships that determine the overall effectiveness of statistical support for the SDGs. Structural and functional analysis was used to determine the place and functions of metadata in the statistical support system for the SDGs, and to study their role in ensuring the transparency of the methodology, the reproducibility of statistical calculations, the interpretation of indicators, the assessment of their quality, and the international comparability of statistical results. This method allowed us to show that metadata is a functionally central part of the statistical system. The logic modelling method was used to construct a diagram of the relationships between the CES and SDG indicators, sources of statistical data based on the SNA, stages of statistical production, potential sources of errors and mechanisms for their prevention or correction. The constructed models made it possible to systematise the factors affecting the quality of statistical indicators and to substantiate the directions for improving the processes of forming the information and analytical base for monitoring the SDGs. Logic models became a tool for visualising and formalising ideas about how statistical processes are arranged in the context of the SDGs and where it is appropriate to introduce changes.

RESULTS AND DISCUSSION

Coordination of statistical activities based on reliable and complete data to achieve the SDGs has traditionally been considered as the interaction of the United Nations (2008) with the United Nations (2013), which was reflected in the documents of the IMF (n.d.), Eurostat (2021). The integration of statistical data is the methodological basis of the system of comprehensive economic statistics (CES), which involves harmonising, first of all, the SNA, balance of payments, employment, and other macroeconomic sources on the basis of common concepts, classifications, and research periods in order to ensure their compatibility, integrity, and international comparability. Such an integrated system makes it possible not only to quantify the contribution of individual factors to the slowdown in global growth, but also to track the redistribution between countries and sectors and to monitor the achievement of the Sustainable Development Goals (SDGs). The recommendations outline a general framework for integrated economic statistics, based on the principles of the national statistical system's statistical infrastructure and applying best practices in modern business architecture (United Nations, 2013). The framework is suitable for use in statistical systems at different stages of development and can operate under centralised or decentralised models.

The definition of sustainable development serves as the basis for creating a macroeconomic model that balances economic growth with consumer needs, requiring adherence to the principle of international consistency. This compliance applies both to concepts, classifications, and accounting rules reflected in the system of national accounts (United Nations, 2008), and to a networked approach to coordinating economic relations, the advantages of human capital and information, the prioritisation of service sector development, and the growth of investments in creative industries based on the legitimate use of data. It is worth noting that the relevant documents, from their implementation to the present day, have served as a macroeconomic standard for the global community in shaping a modern, multidimensional system for assessing development based on the principles of evidence-based policy, under conditions of statistical data harmonisation. The constant compromise between the interests of national

economies and the need to align them with generally accepted rules for assessing sustainable development, which enable a correct comparative analysis between countries, has led to the emergence of a large number of clarifying, declarative, and normative-instructional documents. At the same time, such documents cannot fully satisfy the interests of all participants in the specified process.

In Ukraine, the adoption of Resolution of the Cabinet of Ministers of Ukraine No. 989 (2023) is linked to the implementation of the Decree of the President of Ukraine No. 722/2019 (2019), and the Order of the Cabinet of Ministers of Ukraine No. 686-2019-r. (2019), which aim to harmonise the national statistical system with international and European norms and standards. In line with the Sustainable Development Goals (SDGs), the modern model of economic growth aims to balance economic, social, and environmental components while maintaining equilibrium among the world's leading economic regions. Achieving this balance is ensured through a set of actions and decisions that are based on a system of quantitative and qualitative characteristics. The totality of such economic and statistical characteristics, which provide a consistent and comprehensive understanding of economic activity, is represented by CES, which serve as the methodological foundation for assessing and monitoring sustainable processes. The purpose of CES (United Nations, 2013) is to characterise the state and dynamics of economic activity by combining different groups of economic-statistical data into a single logical system, ensuring the coordination of interactions between national and global initiatives in the field of sustainable development. It is worth considering that if the comprehensiveness of economic statistics is achieved through specially designed systems of interconnected indicators that cover as many key aspects of the economy as possible, then accurately measuring economic activity in a globalised world- assuming data consistency and continuity- facilitates the process of integration. The use of CES (United Nations, 2013) offers the opportunity to:

- achieve relative consistency and transparency in the application of concepts and definitions of economic development through unified approaches and tools,
- improve the accuracy of economic data by reconciling discrepancies between data obtained from different sources through integration processes,
- align data between short-term indicators and macroeconomic development data during critical phases of economic growth,
- coordinate the distribution among sectors of the economy by different types of products, industries, or regions,
- harmonise the distribution of macroeconomic indicators across countries,
- Accelerate the satisfaction of consumer needs by leveraging integrated references.

Despite efforts to implement sustainable development principles, the CES (Liu, 2023; ENECE Statistics, 2024) faces a number of systemic challenges. Thus, even with agreed standards, the level of statistical capacity varies significantly between countries, which complicates the production of reliable and comparable indicators, and the lack of up-to-date, complete and comparable data on numerous indicators related to the Sustainable Development Goals in the regions and the failure to reflect the new requirements of the sustainable development context in traditional statistical indicators - creates inconsistencies between existing methodologies and the needs of monitoring development goals. Finally, the varying paces of implementation and the use of alternative sources of information and big data across countries exacerbate problems with data quality, representativeness and coherence. It has been established that the classical definition of CES (Table 1) differs from the integrative approach in its conceptualisation of sustainable development.

Table 1. The classical definition of CES

The overall structure of the traditional CES system				
CES Blocks				
Conceptual-methodological	Informational	Indicator system	Processing and analysis methods	Organisational and institutional
Basic characteristics				
■ formation of the theoretical basis; ■ determination of the methodology for constructing indicators	■ primary sources; ■ auxiliary sources	■ macroeconomic indicators; ■ sectoral and structural indicators	■ collection and preparation of data; ■ selection of analytical tools	■ separation of statistical bodies and other data producers; ■ coordination of the regulatory framework and infrastructure

Source: prepared by the authors based on O.Yu. Guseva *et al*. (2020)

The connection between the blocks of the specified CES structure is designed to facilitate the integration of economic measurement across macro, meso, and micro levels. In contrast to the general understanding of the systematisation of the integration process (United Nations, 2013), the integration process requires a systemic approach, the basis of which is the use of the SNA as a conceptual organisational framework for economic statistics, ensuring coherence and interconnection of elements contributing to the preparation of statistical data, as well as creating favourable conditions for the integration of the statistical sphere. The study demonstrates that the integration of economic statistics in the context of the SDGs (Table 2) is aimed at ensuring the interconnection of the most complete monitoring of existing sustainable development processes, eliminating data fragmentation with the creation of a reliable information and analytical base for the development of policies aimed at balancing economic growth, social justice, and environmental sustainability. The observed differences provide grounds to argue for a need to connect economic theory and economic statistics at the international level through the consistency of concepts, definitions, and classifications across different data sets, as well as through the quantitative consistency of data obtained from different sources. However, different countries may have different definitions and levels

of evaluation for similar phenomena and processes. The SNA and accounting both consider economic phenomena based on the principle of double entry. However, while the SNA focuses on macroeconomic flows across the entire economy, accounting records transactions for individual entities. Both use double-entry based on balancing each transaction, but they differ in scope, transaction types, and balancing methods. In particular, it should be noted that in accounting, double-entry bookkeeping maintains the balance between assets and liabilities by recording transactions so that the debit in one account (assets/expenses) matches the credit in another (liabilities/income) (Structure of the national accounts, n.d.; Bilova, 2012). The primary focus is on profit, depreciation, and reserves. In the SNA, transactions are recorded across sectors of the economy, ensuring that each entry is balanced within a sector or between sectors. This involves detailed recording – effectively twice – when resources equal their usage, and twice between sellers and buyers, covering aspects such as mixed incomes, product taxes, and transfers. More accurate responses to questions come from those who understand the accounting definitions, but if additional information is needed, understanding the sector's operations at the reporting unit level is essential.

Table 2. Modern vision of the CES system

Components of the CES system			
Scale of integration	**Elements of statistical infrastructure**		
Basic characteristics			
Classification of statistical activities	SNA	Institutional mechanisms	Preparation of statistical data
Definition system			
Structuring types of economic activities	As a standard of economic accounts at the international level	Delegation of responsibility for the formation of an effective statistical research program	Information on consumer requests
Structuring sectors of the economy	Reconciliation of statistical data	Inter-sectoral coordination in statistics and strategic planning	Combining information from statistical units and basic units of the SNA

Source: prepared by the authors based on UNDP (2018), United Nations (2013), World Bank (2019)

During the process of statistical data reconciliation, adjustments must be made (United Nations, 2008; United Nations, 2018; Matkovskyi *et al*., 2022) at the aggregated level in order to eliminate discrepancies in definitions. To achieve methodological consistency, measures such as harmonisation of methodologies, recategorisation of data, and the implementation of special transformations aimed at aligning flows and stocks are employed. Thus, the significance of the presented results lies in the fact that the principles of the accounting standard are consistent with the principles of the SNA, in that economic substance should take precedence over legal form. Discrepancies between accounting records and the SNA should be corrected in the survey data to eliminate statistical inconsistencies, primarily caused by double-counting or incomplete coverage (Table 3).

Table 3. General correspondence concerning the types of adjustments to the sources of errors

Typical sources of error	Primary sources of error	Main types of adjustments
Principles of valuation	Accounting – emphasis on historical cost. SNA emphasises market (factor) costs.	Survey data are converted from market prices to comparable figures, taking into account inflation and SNA methodology.
Coverage of economic activity	A lack of equality between assets and liabilities is a variant of arithmetic o r recording errors.	Adjustments are made for sectors where accounting reports are supplemented by surveys, ensuring that discrepancies caused by the shadow economy or illegal activities are eliminated.
Data aggregation methods	The discrepancy between debit and credit turnovers in synthetic accounts (incomplete data; duplicate entries) distorts the aggregated data for the SNA.	Corrected by balancing the SNA accounts using the commodity flow method, where sector indicators are reconciled without sequential aggregation, which reduces errors from primary sources, including accounting data.

Source: prepared by the authors based on research by M. Kulynych (2024)

The principles of SNA 2008 involve an iterative process of integrating primary sources, addressing discrepancies, and consolidating data through account balancing and ongoing corrections In this context, primary data sources in accounting and statistical systems are understood as documents or records that record economic transactions at the moment they occur, serving as the basis for the formation of registers and reports, ensuring the accuracy, completeness, and timeliness of the informational representation of economic processes. Based on this, from a practical point of view, it is advisable to expand the data collection sources, enabling a more thorough comparative analysis. Reliable statistics form the basis of this work, serving both as a method of accounting and a tool for analysis. Historically, official statistics have been the primary source of data for countries worldwide. However, the quality of official data remains a critical concern for national statistical offices. The ongoing reforms in public sector accounting, especially regarding the alignment and differences between International Public Sector Accounting Standards and public finance reporting principles, offer an opportunity. They can enhance the information database for comparisons and help identify issues arising from incompatible data.

It has been shown that achieving an appropriate level of consistency in economic data depends on the research purpose. Public sector accounting and public finance

statistics have different purposes. If accounting is aimed at reflecting and presenting financial information on the financial results of an economic structure in the public sector, then public finance statistics are aimed at determining the impact of the general government sector on the economy and providing information for macroeconomic accounting. These functions differ in how they define, measure, and classify data. Public sector accounting relies on International Public Sector Accounting Standards (IPSAS), which standardise data for public finance statistics under the accrual basis IPSAS (2025), ensuring an accurate view of the financial position during the reporting period. If the scope of reporting government finance statistics is determined by market opportunities and based on current market value, then International Standards are based on the principle of consolidation to increase efficiency, simplify management, and obtain a complete picture of the financial or operational situation. Only this basic difference necessitates adjustments to the process of collecting public finance statistics.

The consistency and even partial resolution of the issues above are reflected in the International Public Sector Accounting Standards (IPSAS, 2019), which ensure comparability with both previous financial reports and those of other organisations. However, full adoption of these standards is not compulsory for countries worldwide. The significance of the presented results lies in the difficulty of determining the extent of implementation of the specified standards at a global level, when, within the national economies of a particular country, accounting requirements may differ between central government bodies and non-central and territorial authorities. It should be noted that the research has certain limitations in its data collection system, which can be summarised as: the comparison of concepts, definitions, and classifications, as well as the regularity of using statistical tools. If the process of comparing concepts, definitions, and classifications aims to facilitate their application both within the statistical system itself and outside it, then gathering a complete set of data through regular aggregation will help reflect the organisational structure of all statistical units within the economy of a given country. If the current data collection system in most countries involves integrating information from each subdivision of a specific economic sector into the GNI, then the latest method of combining economic statistics is based on the potential to harmonise survey methods and assessments across various sectors of the economy (Table 4). The overall framework for comparing the approaches outlined above is as follows.

Table 4. Comparative characteristics of data collection schemes: basic definitions

Traditional		Modern	
Advantages	Disadvantages	Advantages	Disadvantages
availability of access to data by specific segments of the economy	inconsistency in the timing of data receipt with user needs	enhancement of the accuracy and consistency of information for users, unification of micro- and macro-data, introduction of agreed methods of data editing	inability to develop a single approach to the implementation of comprehensive economic statistics

Source: prepared by the authors based on United Nations (2013), United Nations (2018), World Bank (2019)

The basic approaches in statistics, data warehouses, and data quality management that enable the determination of the sequence of information aggregation are bottom-up and top-down data collection. The general definition of these systems is provided in Table 5. The "bottom-up" data collection procedure is aimed at the efficient use of limited resources and meeting user needs in the context of the desire to update and expand statistical research. When collecting data using this procedure, there is a risk of incompatibility, which can be reduced through standardisation and control at the integration stages. The reverse "top-down" procedure is based on the use of aggregated macroeconomic indicators, formed within the framework of national accounts, and is more focused on ensuring the benefit of obtaining accurate and consistent data.

Table 5. General scheme of the data collection procedure

Data collection procedure			
bottom-up system		**top-down system**	
Foundations			
use of general concepts, definitions, assessment methods, and data sources		unification of the tools for sample surveys and methods of data collection and calculation	
Advantages	Disadvantages	Advantages	Disadvantages
Consistency, scalability	Slow start	Speed, flexibility	Risk of inconsistency
Result of the application			
improving data consistency, reducing the burden on respondents, implementing automated data editing methods		resolving discrepancies in registers, using familiar data sources and methods of their assessment as basic conditions for improving data consistency, consistency of micro- and macro-data with each other	
Specifics of statistical estimation			
reduction of the likelihood of errors, improvement of data accuracy		possibility of seasonal adjustments, ensuring data balance, and extrapolation	

Source: prepared by the authors based on S.R. Shakil (n.d.), Top-down versus bottom-up data quality approach (n.d.), Recommendations for creating data warehouses and examples of their use (2024)

It should be noted that the issue of forming a general data collection scheme is of a discursive nature. Different countries use various procedures for data collection and methods of processing them, which leads to discrepancies in the results of the conducted research, complicates the integration of statistical information, and leaves open the question at what level the data should be harmonised under comparison conditions. In the practice of Eurostat (2021), the "bottom-up" approach is applied through a system of sample surveys and administrative registers, which allows for the collection of representative data considering the specific development of regions. Meanwhile, the "top-down" approach within the SNA (United Nations, 2008) provides the possibility for international comparisons to facilitate global monitoring of the achievement of Sustainable Development Goals. It is worth emphasising that, at the same time, the advantages of one method to some extent constitute a disadvantage of another: the "bottom-up" approach provides depth of analysis but can lead to fragmentation of information, whereas the "top-down" approach guarantees systematisation but often loses local specificity.

Summarising the above, it can be concluded that the problem of data collection in KECS lies in the need to choose between alternative approaches or their combination. According to the authors, it is advisable to proceed from the premise that results obtained by different methods should mutually correct each other. It seems legitimate, in accordance with current demands and the specific development of regions, to utilise a hybrid approach that allows for the maximum possible balancing of accuracy, consistency, and analytical value of the data. The practical value of the obtained data lies in the possibility of further application of the indicator system, which provides answers to the question of analytical consistency of measures and procedures regarding the assessment of the sustainability of countries worldwide in accordance with the SDGs, and at the same time, serve as tools for monitoring economic development through the SNA. National statistical offices play a vital role in implementing SDG indicators, overseeing data collection, validation, and monitoring for national sustainable development strategies. However, methodological inconsistencies, resource limitations, and data-related challenges hinder the integration of these indicators into official statistics.

In the modern concept of sustainable development, the role of system-forming indicators from Ministry of Economic Development and Trade of Ukraine (2017), V. Ivanchuk & N. Moshniaha (2021) is performed by economic indicators, because they allow us to assess not only the pace of economic growth, but also its inclusiveness, resource efficiency, environmental sustainability, and social effectiveness. Economic growth in itself does not guarantee sustainable development, but it creates the necessary financial and institutional prerequisites for achieving most global goals. These goals are based on intersectoral linkages, in which GDP, labour productivity, employment levels, and inequality reduction act as catalysts for positive change.

The basic indicator of economic development of countries is traditionally GDP (SDG 8.1.1), the dynamics of which determine the resource capabilities for achieving a wide range of SDGs, the growth of which by only 1% provides: 51% of expenditure on social CSER 15 or funding for 70% of the global goals or the opportunity to address environmental CSER 13. The inclusiveness of economic growth is ensured by the employment indicator of the population aged 20-64 years (SDG 8.5.1), positive changes in which contribute to reducing poverty (SDG 1), expanding access to quality education (SDG 4), and reducing economic inequality (SDG 10). The determining factor of long-term economic development is labour productivity (SDG 8.2.1), which ensures the resource efficiency of economic systems by stimulating the creation of high-tech and "green" jobs, the development of innovative infrastructure (SDGs 7-9), and also generating a 1:3 multiplier effect on social outcomes. The indicator of economic inequality is measured by the Gini coefficient (SDG 10.1.1); a reduction of 0.05 improves 40% of social indicators, while values greater than 0.3 impede the achievement of SDGs 1-5, exacerbating poverty. The National System of SDGs of Ukraine includes 183 indicators (Order of the Cabinet of Ministers of Ukraine No. 686-r, 2019; State Statistics Service of Ukraine, n.d.), which are mainly economic: SDGs 8 (decent work and economic growth), SDG 9 (Innovations and Infrastructure), SDG 10 (reducing inequality), SDG 12 (responsible consumption and production), which form the information and analytical basis for a comprehensive assessment of the achievement of the SDGs in the country. Therefore, economic indicators characterise not only the outcomes of economic and business activity but also provide a quantitative assessment of decisions regarding the achievement of the SDGs.

In particular, it should be noted that the most complex to collect data on SDG, economic indicators require detailed microdata, which aligns with a "bottom-up" data collection system, namely data from the informal sector or private financial flows, where standardised sources and statistical capacity are lacking (OECD, 2025; Landau *et al*. 2025). It is believed that filling the gaps in complex SDG economic indicators will be achieved through the integration of statistical systems, even temporarily, ensuring the accuracy of assessments without losing compatibility with official standards – by using a hybrid approach to data collection (Pietras, 2023; OECD, 2025). The primary element ensuring the transparency and reliability of assessments, especially for complex SDG economic indicators, is the evaluation of uncertainty in methods for filling gaps in statistical data. This includes a quantitative assessment of errors and risks associated with imputation or modelling, utilising standard statistical approaches. The overall view of the interconnection between the main issues of the SDG economic indicators under the conditions of improving the SES is shown in Table 6. Considering that statistical practice involves tracking data over time, it is advisable to pay attention to natural shifts in the data. To assess the consistency of the data, it is necessary to introduce certain metrics that will enable monitoring of the situation and quick identification of problems. Table 7 shows a general framework of how data consistency metrics interact with time delays during their verification. A compromise between data consistency and delay is advisable to be calculated using multi-criteria optimisation, where consistency and integrity are maximised, and delay is minimised using weighting coefficients or Pareto optimality. This solution cannot be improved in all parameters simultaneously.

Table 6. General scheme for improving statistical work to address issues with SDG economic indicators

Problems with economic indicators			
insufficient data quality	methodological and conceptual limitations	inequality of statistical capacity	limited coverage and level of detail
⇧ ⇩			
Inequality and distributions (SDG 10)	The labour market and productivity (SDG 8)	Innovations and investments (SDG 9)	Financial flows (SDG 17)
SDG economic indicators that are the most difficult to collect data on			
⇧ ⇩			
A combination of modelling methods	Integration of alternative sources	Hybrid approaches and standardisation	
Methods for filling gaps in complex economic indicators			
⇧ ⇩			
Standard statistical methods	Model approaches	Assessment for hybrid sources	
Uncertainty assessment in gap-filling methods			
⇧			
Use of new sources	Modernisation of national statistical systems	Use of operational forecasting and gap-filling models	Optimisation of the frequency and design of surveys
Methods for improving statistics for SDGs			

Source: prepared by the authors based on M. Nilashi *et al*. (2023), T. Sanseverino (2023), OECD (2025)

In the modern information society, ensuring the quality, consistency, and interpretability of statistical data is of key importance. Metadata plays a leading role in the formation of an effective statistical system, which, within the CES, serves not only as an auxiliary element but also as an integral part of the methodological infrastructure. In the CES, they provide the overall context, quality, and interpretation of data for the analysis of macroeconomic processes, national accounts, and sustainable development indicators. Metadata are not just data about data; they are a set of permissible structured descriptions that are explicitly available and intended to help locate the object. Their purpose is to provide the context for the correct interpretation of statistical indicators, which is especially important in integrating diverse data sources. At the same time, the role of metadata in modern analytical practice remains a subject of debate due to the contradiction between standardisation and flexibility, resource limitations, and the increasing demands for data quality in the digital age, as well as the necessity to strike a balance between the level of detail and practical usability. If the excessive complexity of metadata makes their utilisation difficult, then simplifying them reduces their analytical value. The absence of a universal metadata model results in a variety of approaches (IMF, UNSD, SNA, Eurostat) to the formation and use of metadata. At the same time, it should be noted that metadata's complexity stems from its substantive nature: it can simultaneously enhance data quality and complicate data processing.

Table 7. General diagram of the interaction between the metrics for assessing consistent data and time delay

Metrics for assessing data consistency		**Time delay metric for data consistency**	
Metrics	Characteristic	Metrics	Characteristic
Partial metrics of matches and discrepancies	Proportion of records among sources with completely matching key fields	Normalisation of time windows	Proportion of matches in normalised windows, where the shift is optimised based on historical lags
	Share of discrepancies exceeding the tolerance threshold		
Metrics of aggregate consistency	Average and median relative divergence between sources for each indicator	Lag and timeliness metrics	Tracking the median lag between the event date and the availability of data from a specific source. Corrective component = relative discrepancy * dependence coefficient on the lag
	Maximum deviation and the number of "critical" deviations as an indicator		
Logical consistency and business rules	Number or proportion of violations of logical rules and business rules	Dynamic divergence thresholds	Definition of the threshold depending on time, with the presence of new and old data: * new data (lag < 1 week) – strict threshold of 2%; * old data (lag > 1 month) – strict threshold up to 10%
	Consistency index, according to the rules, is a percentage of successfully passed tests		
Co-regency and stability over time	Comparison of trends between sources, the proportion of periods during which the sign of change coincides	Trend and causal time concordance	Consistency by levels and dynamics. Calculation of the trend correlation coefficient considering a time shift
	Definition of divergence stability		
Composite indices of consistency quality	Definition of the integrated weighted consistency index is the product of the proportion of matching records, the proportion of cells with deviations below the threshold, the index according to business rules, and trend stability	Monitoring and alerts for lags	Anomaly detection using the "lag* divergence" matrix
	Number of cases of inconsistency requiring manual correction		The action of alerts occurs when the discrepancy grows faster than the lag

Source: prepared by the authors based on O. Pyshchulina (2020), L.V. Batchchenko & O.V. Reva (2023), V.Y. Khaustov *et al.* (2024)

According to the authors, it is advisable to proceed from the need for an optimal balance between the level of detail of metadata and their practical value for users, which requires further development of methodological approaches to the identification and management of metadata to achieve global Sustainable Development Goals. From an analytical perspective, the use of classifications alongside metadata as a key element of the economic classification system is of interest, as they provide structuring, description, and standardisation of data for the analysis of economic processes. In this context, if metadata describe the content, origin, and characteristics of statistical data, then classifications organise observation objects for comparison at both national and international levels. Metadata links classifications with data through models, enabling automated tracing from sources to analytical cubes. In Ukrainian practice, aligned with international standards, this is implemented through the State Statistics Service's systems for SDG monitoring and the digital economy. Such an approach minimises errors in time series and improves data quality assessment.

In national statistics, several main types of metadata are used, which are standardised according to the GSIM and SDMX models to support the tracking, promotion, and interpretation of data quality. In accordance with UN standards for data integration into the IES, particularly for monitoring sustainable development through the SDGs, GSIM provides a conceptual framework for describing statistical objects and processes; that is, it focuses on the conceptual model of information, while SDMX standardises data and metadata exchange, that is, it focuses on the technical standard for data and metadata exchange. Recommendations for integrating GSIM and SDMX in national statistical offices for IES are based on the principles of gradual implementation, with an emphasis on IT infrastructure. The use of GSIM for modelling metadata for digital processes and SDMX for automated data exchange with Eurostat and/or UNSD ensures compatibility with IES. The rapid evolution of technology leads to an underestimation of data, which is addressed by Big Data analytics and ongoing data processing procedures at national statistical offices.

The use of GSIM and SDMX standards involves integrating indicators of digital technologies, such as AI, Big Data, and e-commerce, into national accounts, thereby more accurately measuring their contribution to GDP and the SDGs, considering the actual contribution of these technologies to growth. However, it complicates the methodology due to the specifics of intangible assets and non-monetary transactions. Regarding this, the question of the impact of digitalisation on the economy and its reflection in the CES (Table 8) remains a matter for discussion. The problems mentioned in including digital services in GDP complicate traditional methods of national accounts. Double counting in accounting for platform services in GDP arises from platforms' intermediary role, where their commissions overlap with basic transactions. The availability of detailed data on value chains, transactions, and intermediate costs, standardised according to SNA 2008 and IES, will enable the avoidance of double-counting by fixing the value-added indicator.

Table 8. Comparative assessment of arguments regarding the measurement of economic parameters in the context of digital transformations of the economy

Advantages	Disadvantages
Purely economic aspect	
Taking into account the utility of free goods and their impact on productivity in macroeconomic indicators	Digitalisation has made free help, which existed before, accessible and widespread. Therefore, it should not be taken into account now
Taking into account the benefits that consumers have received due to the growth of digitalisation in the world	GDP changes its structure when taking into account the benefits of the product
Correctness of accounting for goods that have undergone significant changes	It is not the product or service itself that changes, but the way it is ordered and delivered
General analytical assessment	
Digital sector integration boosts GDP by 5-20% by capturing value added from AI, Big Data and e-commerce	Rapid depreciation of digital assets leads to significant GDP fluctuations
Allows to correct underestimation of free services through satellite accounts, ensuring comparability with OECD and/or Eurostat standards	The ambiguity of classification features according to NACE complicates data collection
	Requires significant resources for Big Data processing, with the risk of overestimation, and without taking into account the quality of the results
	Subjectivity of utility assessment

Source: prepared by the authors based on N. Ryzhikova *et al.* (2022), I. Sierova (2024)

Thus, the contentious nature of the issue is due, on the one hand, to the fact that digitalisation significantly transforms traditional economic processes, leading to the emergence of new forms of value creation, and on the other hand, because existing statistical approaches do not always fully account for these transformations, complicating the provision of completeness, comparability, and consistency of indicators. The adoption of the updated version of the United Nations (2025) is aimed precisely at taking into account the above provisions. Therefore, further research is needed to develop approaches for integrating digital economy indicators into the System of National Accounts to enhance its analytical value and alignment with modern development conditions. Based on the conducted analysis, it has been established that the integration of economic statistics is a key prerequisite for ensuring the consistency of economic development assessments. It has been determined that the balance of sustainable development components is formed through the systematic interaction of economic indicators, which serve as the fundamental metrics for evaluating development effectiveness.

The results of the study confirmed the high level of ambiguity in applying the CES to achieve the SDGs and, at the same time, the complete dependence of strategic decisions on sustainable development on the completeness and accuracy of the assessment of economic processes. The basis for the consistency of the SDG and CES indicators is the 2008 SNA, which today requires ensuring methodological compatibility between the requirements for measuring sustainable development and the realities of globalisation, digitalisation, and society's environmental sensitivity. Given that the study's methodological basis is a systematic approach, it is legitimate to prioritise a comparative assessment of the working and updated versions of the SNA (United Nations, 2025), which enabled us to identify the following differences. The SNA 2025 focuses not only on measuring market economic activity through GDP but also on indicators of non-market phenomena such as unpaid work, social capital, and quality of life, thereby reducing the systemic gap between what is measured by the CES and what is needed for monitoring the SDGs. SDG indicators related to innovation, industrialisation, and global partnership should be properly integrated into the CES. A sufficient level of data consistency across international statistical systems is aimed at reducing discrepancies in definitions, classifications, and assessment methods, and the availability of updated unified SNA 2025 guidelines is considered an opportunity to reduce methodological discrepancies between countries for direct comparisons. The expansion of data disaggregation in the SDGs aims to establish a connection between macroeconomic aggregates and indicators of quality of life and sustainability, which, from the perspective of the CES, requires new approaches to the sectoral assessment of economic processes, including the isolation of observation units and their integration with administrative sources.

According to J. Jansen & X. Wang (2024), developing policies for economic growth measured by GDP distracts from sustainable well-being. The new UN initiative "Valuing what matters" provides an opportunity to establish and institutionalise a global measurement of indicators that go beyond GDP. It addresses the lack of interdisciplinary collaboration by providing a single measurement approach; it eliminates the confusion caused by numerous alternatives beyond GDP by offering a structured analysis of 65 indicators and outlining their measurement objectives; and it narrows the gap between scientific proposals and country-specific approaches. The study by J. Tebrake (2026) demonstrated the importance of developing and maintaining international statistical standards for measuring economic activity and argued that statistical methodology is increasingly a continuous process that will ensure a timely response to the emergence of new economic phenomena.

Scientists M.A. Sánchez Turner & J.M. Graña (2026) critically examined the limitations of system of national accounts (SNA) in capturing key economic flows. The authors propose extended accounts within the SNA framework that include mechanisms for transferring surpluses between sectors, thereby allowing for a more accurate reflection of the dynamics of economic development. The differences between the United Nations (2008) and the United Nations (2025) have led to existing contradictions between the SNA and the SDGs, which can be summarised as follows.

If the current system of statistical information on which the assessment of SDG achievement is based is not representative of a full assessment of sustainable development, and economic goals for ensuring sustainability and productive employment often do not have clear limitations, then, in the absence of a unified approach, the question arises of assessing the trade-offs between economic benefits and environmental losses. The United Nations (2025) methods for assessing well-being involve constructing aggregated indicators, such as GDP per capita, average income, and the human development index, which are well-suited to international comparisons; however, to reflect inequality and differentiation, they require a high level of disaggregation. Therefore, a contradiction arises due to limited data on countries, their incompleteness, and disaggregation or methodological inconsistencies; comparability over time between aggregated and disaggregated indicators, as well as trends in their dynamics, is affected. It is determined that the same assessment system can give opposite results regarding development trends depending on the level of aggregation.

According to M. Nilashi *et al*. (2023), considering the SDGs as a set of specific, measurable, and time-bound national development goals, it is necessary to focus on the low quality, outdated, and incomplete data, their critical shortage for tracking progress in different countries. The issue of the lack of available data is defined as an obstacle to assessing progress in achieving the SDGs, incomplete data complicates the accurate measurement of the results of the SDG implementation and making management decisions, making it impossible to accurately predict indicators. The authors proposed the use of big data analytics as an effective alternative to address data quality problems and improve monitoring of progress in achieving the SDGs. The SNA is traditionally focused on short- and medium-term data flows, whereas sustainable development requires a long-term perspective, creating a contradiction between indicators of current economic efficiency, such as the GDP growth rate, and indicators of long-term sustainability, such as ecological limits and trends in determining a country's wealth.

The SDGs and the SNA 2025 are positioned as universal frameworks, but national economic models, levels of development, institutional systems, and environmental conditions vary significantly between countries, and indicators such as GDP per capita, energy intensity, and the proportion of the poor population may have different meanings for well-being in different contexts. A review of the new elements included in the 2025 SNA (Zwijnenburg, 2026) that identified modern aspects of the impact on well-being, which will change the vision of the conceptual foundations of comparative assessment, and in the future, reduce the conflict between the requirement for international comparability and the need to take into account national specifics. Contradictions between monetary and non-monetary assessments arise from a lack of a unified approach to weighing these components in composite indices, methodological uncertainty in the monetary assessment of intangible goods, and differing dynamics between monetary and non-monetary components. As a result, there is methodological inconsistency across integral indices because changing the weights or methods

for evaluating individual components can radically alter the overall view of the economic situation.

The parallel use within one country of different assessment tools that have their own weighting logic, sets of indicators, and normalisation methods leads to contradictions in the choice of the basic tool for assessing sustainable development and to different trends across indices for one country. Thus, the SNA 2025 has increased its emphasis on integrating statistical data, as reflected in clearer requirements for consistency among national accounts, balance of payments, financial statistics, price statistics, and employment. This requires statistical authorities to use common classifications and the same collection periods and data from different sources, to reuse the same microdata or aggregated data in different subsystems, to apply cross-checking of data between sources to identify inconsistencies and, as a result, to ensure the integration of metadata into a single statistical information management system and to enable users to track the chain "source → processing → SNA aggregate". In the SNA 2025, the requirements for metadata quality and assessment transparency are set within the framework of the quality of official statistics, with an emphasis on the specifics of national accounts as an integrated macroeconomic system. The process of integrating statistical data into the CES according to the requirements of the SNA 2025 provided for the possibility of tracking how the same microdata or aggregated data are used in different subsystems, but without a clear description of the methods, assumptions and reconciliation procedures, users will not be able to correctly interpret complex indicators, especially in periods of crises, military operations, and rapid structural shifts. At the same time, a detailed description of concepts, sources, and methods, contributing to the interconnection of the CES with the SDGs and the formation of sustainable development indicators based on national accounts and related statistical systems, makes it impossible to compare information across countries if detailed requirements for comparison are not met.

The author R. Dell'Anno (2024) considers a hybrid approach that combines data from the Eurostat tabular approach to determine the exhaustiveness of national accounts with theoretical hypotheses for macroeconomic estimation. This helps fill the gap in demand for reliable estimates for international comparisons, given the limited availability of official national accounts statistics. However, this approach is only considered as a driving force for estimating the shadow, informal, and illegal economy. Under the considered conditions, the question arises of ensuring comparability of the time series when transitioning to the new SNA 2025 standards, because the specified procedure determines the accuracy of the macroeconomic indicators used to characterise sustainable development. The validity of the specified issue was determined by Yu.M. Kharazishvili (2019) and remains valid to this day, which makes it possible to quantitatively assess the level of "break" (level break) between the dynamics series of indicators and analyse the change in their structure.

From a statistical point of view, the most complete option for ensuring comparability is provided by retrospective re-estimation of series (backcasting) construction of complete time series according to the new methodology for as long a period in the past as possible. Statistical services should review all available data from previous years, taking into account new definitions, classifications, and methods, and compile a single series of dynamics in terms of the 2025 SNA, covering both the period "before" and "after" the official transition. This ensures not only maximum comparability over time but also enables the analysis of long-term trends without methodological gaps. The optimality of accounting for changes over time is offset by the need for significant resources and a phased implementation, given the availability of new data sources or additional resources. The rapid development of digital technologies and the spread of big data have fundamentally changed not only approaches to statistical analysis, but also the very structure of the SNA. The comprehensive impact of digitalisation on the economy and the lack of an agreed-upon definition have made it difficult to assess the volume of the digital economy.

The basic challenges that have arisen in statistical activities due to the global spread of digital technologies have been examined by scientists. The directions for the development of the system of statistical measurement of the parameters of the digital economy were highlighted by I.O. Artemieva (2020), who demonstrated the need to build a comprehensive system of measurement for these parameters and outlined the requirements it must meet. This is consistent with early findings from the IMF (2024), which reviews the challenges of measuring the digital economy within the NPA framework. However, the findings of this study suggest that the structure and dynamics of digital industries vary across countries and over time, and the estimates themselves depend heavily on the data sources used. The need to improve data sources to better identify the impact of digitalisation and facilitate policy-making that takes into account the economic benefits of this process remains a basic requirement for the coherence of analytical work over time.

The consistency of the development of digital technologies and their reflection in the CES and the SNA for the achievement of the SDGs is determined by the requirement of mandatory consideration of the "country-region-enterprise" relationship, since it is at the junction of these levels that data flows, added value and digital assets are formed, which form the basis of modern economic statistics. The study by L.V. Batchchenko & O.V. Reva (2023) demonstrated the effectiveness of implementing comprehensive development strategies, both at the state level and at the level of a region or an individual enterprise, under conditions of forecasting the processes accompanying the digital transformation of the economy. If the SNA 2025 aims to expand the accounting methodology, the digital statistical analysis system, in turn, enables the aggregation of indicators from lower levels to the macro level in real time, thereby ensuring the integrity of statistical monitoring of digital transformation and its consistency with the SDGs. This study highlighted several important findings regarding the relationship between the CES and the SDGs. First, the study is based on a thorough comparative analysis of the CES, SNA and SDG methodologies. Second, the adoption of the 2025 SNA introduces a number of important conceptual changes that expand the scope of measuring economic activity, assets, welfare and sustainable development, but is, above

all, highly dependent on the quality of primary statistical information, the need for integration with other statistical systems and limited operational efficiency of statistical estimates. These limitations do not affect the overall reliability of the results obtained but determine the directions of further scientific research.

CONCLUSIONS

The study showed that the CES is a key tool for ensuring the coherence of economic development assessments in the context of implementing the SDGs. Based on the fact that the SNA should provide a consistent and coherent description of economic activity at different levels of data aggregation, it is argued that unification of common definitions and characteristics of macro- and micro-data reduces duplication of requests for similar information, prevents confusion and unreliable reporting, reduces the burden on respondents and increases the accuracy of information. However, the practical implementation of this depends on developing a methodological framework for selecting statistical units for data collection and analysis. The CES is a sustainable development assessment tool that integrates economic, social, and environmental indicators using GSIM, SDMX, and SDG indicators. The CES has been proven to contribute to economic growth through the accurate measurement of indicators, which should be based on harmonised data from different sources.

It has been established that classical statistical methods demonstrate systemic limitations in the context of digitalisation. The lack of detailed microdata leads to an underestimation of current GDP and a distortion of the coefficients of inequality in countries' development. It is evident that eliminating data gaps in complex indicators is possible only by integrating official statistical systems with alternative Big Data sources. The optimal approach for eliminating the trade-off between data efficiency and accuracy is to apply multi-criteria optimisation according to the Pareto principle. The feasibility of implementing a system to control data discrepancies based on their time lag, which affects the construction of forecast estimates, has been demonstrated. Automation of this process minimises subjectivity in the assessment and optimises survey frequency.

The reasons for the inconsistency of economic statistics data that directly affect the process of measuring SDG indicators are identified, which can be summarised as follows: the process of collecting data recorded in the reporting forms of different types of activities or sectors is not coordinated with each other; the application of agreed classifications to all statistical indicators is impossible; national statistical services refuse to fully implement international standards that define not only general concepts, but also the interpretation of interdependent elements of the process of preparing statistical data; the process of data integration depends on the degree of centralisation or decentralisation of national statistical systems; the level of digitalisation and regional disparities in the GSIM and SDMX systems are not fully taken into account; there are no unified approaches to the validation and integration of Big Data with official statistics. Thus, in the future, it is of interest to form basic and, at the same time, unambiguous requirements for data collection and processing, agreed upon at the international and national levels by all statistical services in order to be able to conduct a real assessment of the level of sustainable development of countries around the world.

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Інтеграція статистичних даних у системі комплексної економічної статистики

Анотація. Сучасне суспільство представляє собою складну соціально-економічну систему, ефективність розвитку якої визначається здатністю економіки підтримувати стійкість її елементів протягом певних періодів часу. Метою було обґрунтування інтеграційного підходу до формування комплексної економічної статистики в умовах сталого розвитку шляхом виявлення системних протиріч, оцінки узгодженості статистичних даних та визначення напрямів їх гармонізації відповідно до Цілей сталого розвитку. У дослідженні використано сукупність загальнонаукових і спеціальних методів, зокрема: метод аналітичних узагальнень – для ідентифікації системних проблем комплексної економічної статистики; порівняльний аналіз – для оцінки схем збирання та узгодження даних; системний підхід – для формування інтеграційного бачення статистики; структурно-функціональний аналіз – для визначення ролі метаданих; логічне моделювання – для побудови схем взаємозв'язків між індикаторами Цілей сталого розвитку та статистичними процесами. Встановлено, що сучасна соціально-економічна система характеризується нестійкістю та обмеженою здатністю до відновлення рівноваги, що зумовлює необхідність інтеграції статистичних систем. Обґрунтовано, що баланс складових сталого розвитку досягається через узгоджене функціонування комплексної економічної статистики. Виявлено базові протиріччя в обліковій практиці, а також встановлено залежності між джерелами статистичних помилок і методами їх коригування. Доведено подвійний ефект гармонізації даних державних фінансів із міжнародними стандартами. Розроблено загальну схему взаємозв'язку між проблемами економічних індикаторів сталого розвитку й напрямами вдосконалення статистичної роботи. Визначено роль метаданих у забезпеченні інтеграції статистичних систем і включенні цифрових показників до макроекономічних оцінок. Практичне значення одержаних результатів полягає у можливості їх використання для підвищення узгодженості статистичних даних, забезпечення їх міжнародного порівняння та обґрунтованості управлінських рішень на рівні національних економік у контексті реалізації Цілей сталого розвитку

Ключові слова: сталий розвиток; інтеграція; аналітична оцінка; комплексна економічна статистика; узгодженість даних; типи метаданих; порівняльна оцінка