The article is devoted to the study of the peculiarities of the diagnostic process under conditions of uncertainty. Given that uncertainty is an integral part of the diagnostic process, the study is aimed at increasing the sustainability of economic decision-making in the face of constant economic dynamics. Thus, this article reflects the synthesis of two key areas in economic research – diagnostics and uncertainty – and aims to provide a structured approach to the methodology and tools necessary for an effective diagnostic process under conditions of uncertainty. The article focuses on the importance of economic diagnostics, emphasising that it goes beyond simple analysis and provides a deeper understanding of economic conditions and processes. This means that diagnostics includes not only the analysis of individual factors, but also their interaction and impact on the overall economic situation. By analysing the interconnection of various economic factors, the diagnostic process makes it possible to identify potential risks and opportunities for further development of the enterprise in advance. The authors also offer their own definition of the diagnostic process and detail the stages of economic diagnostics, which clearly reflect the difference between analysis and diagnosis. It is noted that in the context of instability and changes in the economy, it is important to have a clear action plan to effectively address economic problems and prevent crises in the early stages of development. Detailing the stages of diagnostics helps enterprises to respond quickly to changes and adapt their strategies to current conditions. The study considers the use of a mathematical model for diagnosing the financial condition of an enterprise under conditions of uncertainty, which is designed to systematically and accurately analyse the current situation, taking into account the dynamics and uncertainty in observations. This study aims not only to expand the theoretical understanding of diagnostic processes in the field of economics, but also to provide specific tools for practical application in the current economic environment.

Keywords: diagnostics, analysis, conditions of uncertainty, economic decision-making.

FEATURES OF THE DIAGNOSTIC PROCESS IN THE CONDITIONS OF UNCERTAINTY

ОСОБЛИВОСТІ ДІАГНОСТИЧНОГО ПРОЦЕСУ В УМОВАХ НЕВИЗНАЧЕНОСТІ

The article is devoted to the study of the peculiarities of the diagnostic process under conditions of uncertainty. Given that uncertainty is an integral part of the diagnostic process, the study is aimed at increasing the sustainability of economic decision-making in the face of constant economic dynamics. Thus, this article reflects the synthesis of two key areas in economic research – diagnostics and uncertainty – and aims to provide a structured approach to the methodology and tools necessary for an effective diagnostic process under conditions of uncertainty. The article focuses on the importance of economic diagnostics, emphasising that it goes beyond simple analysis and provides a deeper understanding of economic conditions and processes. This means that diagnostics includes not only the analysis of individual factors, but also their interaction and impact on the overall economic situation. By analysing the interconnection of various economic factors, the diagnostic process makes it possible to identify potential risks and opportunities for further development of the enterprise in advance. The authors also offer their own definition of the diagnostic process and detail the stages of economic diagnostics, which clearly reflect the difference between analysis and diagnosis. It is noted that in the context of instability and changes in the economy, it is important to have a clear action plan to effectively address economic problems and prevent crises in the early stages of development. Detailing the stages of diagnostics helps enterprises to respond quickly to changes and adapt their strategies to current conditions. The study considers the use of a mathematical model for diagnosing the financial condition of an enterprise under conditions of uncertainty, which is designed to systematically and accurately analyse the current situation, taking into account the dynamics and uncertainty in observations. This study aims not only to expand the theoretical understanding of diagnostic processes in the field of economics, but also to provide specific tools for practical application in the current economic environment.

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Problem statement. In today’s rapidly changing globalised economic environment, economic decision-makers face uncertainty caused by factors such as geopolitical change, technological progress and unexpected events, as evidenced by the pandemic and the full-scale Russian invasion of Ukraine. Understanding how to effectively implement a diagnostic process in such an environment becomes not only a critical but also a strategic imperative for economic stakeholders.

Firstly, in the field of economic analysis, understanding how to adapt analytical approaches to uncertainty is of fundamental importance. Economic decisions are often based on traditional approaches to analysis and diagnostics, but under conditions of uncertainty, these approaches may not be sufficient or appropriate. As economic systems become increasingly complex, traditional approaches to analysis and diagnosis may not be sufficient to understand the specifics of new challenges. Research in this area can shed light on innovative analytical methodologies that take into account the uncertainty factor, allowing economists to make more reliable forecasts and formulate sustainable strategies in the face of unpredictable economic dynamics.

Secondly, the use of diagnostic tools in the economy is becoming key to the effective formulation of development strategies and risk management. Economic uncertainty affects market dynamics, consumer behavior and supply chain stability. An in-depth understanding of analytical and diagnostic tools provides businesses with the means to identify potential risks, seize opportunities and optimise strategies for sustainable growth. In an era when adaptability is synonymous with competitiveness, the findings of this study can enable businesses to proactively respond to economic uncertainty, promoting resilience and strategic flexibility. At the same time, uncertainty brings a certain level of complexity that requires a comprehensive diagnostic approach. Economic diagnostics goes beyond the simple identification of problems, as it involves a comprehensive understanding of the underlying causes and potential consequences.

In an uncertain economic environment, the ability to accurately diagnose challenges becomes the basis for developing effective solutions. Exploring how diagnostics can be used to overcome economic uncertainty can provide valuable insights for professionals developing adaptive strategies to respond to changing economic conditions. This is especially true during economic crises, when accurate and timely diagnostics are crucial to mitigate risks and ensure economic resilience. In addition, the integration of analysis and diagnostics into economic research ensures a holistic approach to decision-making. The interconnection of these categories provides a comprehensive understanding of economic phenomena, allowing for the development of more reliable and informed strategies.

The synergy between analysis and diagnostics becomes particularly evident when dealing with complex problems associated with uncertainty in the economic environment. Analysts usually deal with incomplete information and unpredictable variables, which makes it difficult to formulate accurate forecasts or prescribe single solutions. The integration of analysis and diagnostics allows for a detailed investigation of these uncertainties. While economic analysis provides a systematic breakdown of economic components and trends, economic diagnostics contributes by identifying root causes and suggesting targeted interventions.

The commonly accepted concept of analysis often involves the systematic breakdown of components, consideration, analysis and research of an object or phenomenon in order to obtain comprehensive information about its structure, properties and patterns of functioning. In the economic context, analysis is used to understand and assess the financial condition of an enterprise, the efficiency of its business activities, as well as to forecast and make management decisions [1]. With regard to economic diagnostics, it appears as a more comprehensive paradigm that provides an opportunity to expand the analytical horizon, identify root causes, reveal interrelationships and develop recommendations adapted to the dynamic nature of an uncertain economic environment. In such circumstances, the diagnostic process encompasses a multifaceted approach, integrating quantitative analysis, qualitative assessments, scenario planning and risk management techniques. Considering uncertainty as an inherent feature of economic systems, this concept recognises the limitations of traditional deterministic models and emphasises the importance of flexibility, adaptability and continuous learning in decision-making processes. In addition, economic diagnostics under uncertainty emphasises the importance of interdisciplinary collaboration, drawing on knowledge from fields such as behavioral economics, complexity theory and systems thinking to enhance the reliability and effectiveness of diagnostic methodology. Through iterative cycles of diagnosis, evaluation and improvement, this approach allows us to navigate complex situations, anticipate risks and develop resilience in the face of uncertainty. It is the uncertainty that creates complexities that go beyond traditional economic analysis and require a more comprehensive and adaptive approach, which is the basis of diagnostics. Diagnostics involves systematically identifying the causes of economic deviations or challenges, while uncertainty is an integral part of economic decision-making due to the variety of factors that significantly affect the outcome [1]. Integrating uncertainty into the diagnostic process makes it possible to consider uncertainty as a necessary element of analysis and planning, rather than as a circumstance that hinders the process of making informed decisions.

Analysis of recent research and publications. Today, the scientific community determines that economic diagnostics, as a multidisciplinary approach, plays a key role in highlighting the main factors affecting economic performance in conditions of uncertainty, since rapid adaptation to them requires the use of an appropriate diagnostic process methodology for effective problem
Economic diagnostics, functioning of enterprises under conditions of uncertainty, stages of the diagnostic process, methodological differences between analysis and diagnostics are the subject of consideration by such scholars as: N. A. Bobko, Y. A. Koval, V. P. Reshetilo, Y. V. Fedotova, Z. B. Lytvyn, V. V. Kovalenko, N. O. Sagalakova, I. V. Krivov'yazyuk, V. V. Byba, T. V. Loza, etc. However, the study of the peculiarities of the diagnostic process under conditions of uncertainty is still insufficiently studied and requires additional consideration, especially for domestic enterprises, whose operating conditions are characterised by permanent transformations and uncertainty.

**Formulating the purposes of the article.** The purpose of the article is to study the peculiarities of the diagnostic process under conditions of uncertainty.

**Presentation of the main research material.** It is worth noting that an important issue from theoretical and practical points of view is to provide a modern classification of uncertainty conditions, as this directly affects the efficiency of the diagnostic process. In general, the classification of uncertainty conditions can be represented as follows (Figure 1).

It should be noted that each criterion for classifying uncertainty conditions is supplemented by various factors that make it possible to more thoroughly reveal their essence and dynamics, to better understand the context and the full extent of their impact on various aspects of the diagnostic process.

Economic uncertainty, caused by unpredictable economic phenomena, affects the assessment and diagnostics of economic indicators of an enterprise. It complicates investment decision-making due to the volatility of factors such as interest rates, inflation and market conditions. Market demand and consumer behaviour associated with economic uncertainty can change the structure of consumer spending, making it difficult to diagnose and forecast indicators such as sales and revenue forecasts. In addition, volatility in commodity prices, exchange rates and trade policies affect supply chains, requiring the adaptation of economic diagnostics to accurately assess the company’s economic position. Government economic policies may also change in response to economic uncertainty, adding additional variables to the assessment of a company’s economic health.

Technological uncertainty, which includes rapid development, innovation, and changes in the technological space, complicates the assessment of the economic trajectory of companies. Innovation can change products and economic indicators such as investment and technological adaptability, affecting competitiveness. In addition, technological change can transform market conditions and require changes in the skills of workers. Regulation is also influenced by technological developments, and economic diagnostics should take these changes into account, including issues related to intellectual property and data security.

Social uncertainty caused by changing societal factors makes it difficult to assess the economic situation of companies. Consumer behaviour, depending on social attitudes and cultural traditions, can have a significant impact on market demand. This makes economic indicators, such as sales and earnings, more sensitive to the social environment. In addition, social uncertainty affects labour force dynamics, which can create challenges in human resources management and affect economic diagnostics. The regulatory environment shaped by social factors also adds complexity, creating new challenges or opportunities for businesses. Economic diagnostic systems need to be flexible to adapt to this uncertainty. Diagnostics under uncertainty also requires an understanding of the time parameters that determine the dynamics of changes in the economic system.

It should be noted that the factors that generate short-term uncertainty have a temporary impact on markets, business processes, and economic conditions. Therefore, they require a quick response and updated diagnostic strategies, namely the use of operational methods of data collection and analysis to assess temporary changes. Long-term uncertainty arises from deep and persistent transformations in the economy and has a long-lasting impact on the structure of industries and market conditions. This requires the use of analytical methods that take into account fundamental changes in the diagnostic process of strategic planning and forecasting for the long term, as well as the use of analytical methods that take into account fundamental changes in the diagnostic process.

The coexistence of global and local uncertainty creates complex challenges for economic diagnostics of enterprises. Global uncertainty, caused by geopolitical events and international economic trends, and local uncertainty, related to regional dynamics and domestic factors, both affect economic diagnostics. Global uncertainty is reflected in the use of international statistics and analytical methods to identify global trends. At the same time, local uncertainty requires the use of local data sources and specific analyses.
to assess the unique conditions and challenges of regions. The interaction of these types of uncertainty is also reflected in the dynamics of supply chains, where problems can have a cascading effect on the economic diagnosis of enterprises.

According to the degree of impact, significant and low uncertainty are defined. Significant is accompanied by a high degree of uncertainty in economic, socio-cultural or technological changes, which makes it difficult to predict or control developments. Such conditions require the diagnostic process to use scenario forecasting and modelling of various possible options, taking into account a wide range of possible risks. The opposite conditions create low uncertainty, characterised by relative stability of the economic environment, smooth changes in events and sufficient information for forecasting and decision-making. In this case, traditional methods of analysis and forecasting are used in the course of diagnostics, and it becomes possible to develop long-term strategies based on stable economic and socio-cultural conditions.

Deterministic and stochastic uncertainties are very similar in nature to the preceding conditions, and they also have a significant impact on the diagnostic process. Stochastic uncertainty arises from random factors that are difficult or impossible to predict. This requires the use of statistical methods, probabilistic analysis and modelling. In addition, the diagnostic process must take into account possible variations and risks associated with random events.

Deterministic uncertainty is characterised by the fact that changes in the economic environment are caused by clear rules and patterns, which makes it possible for specialists to accurately predict and understand the impact of factors affecting economic processes.

Thus, we can state that the conditions of uncertainty in their multidimensional manifestation have a significant impact on the diagnostic process, its correctness and efficiency.

Therefore, in accordance with the above criteria of uncertainty, it is quite logical to differentiate between the categories of analysis and diagnostics. Despite the fact that some authors [1; 3; 4] believe that analysis and diagnostics are interchangeable concepts and involve a comprehensive study of economic factors, they emphasise different aspects inherent in both processes. Economic analysis is a systematic study of economic components to obtain important data for decision-making [5; 6]. It focuses on the evaluation of quantitative and qualitative data, analysis of market trends and other factors that influence economic phenomena. Economic analysis includes descriptive and predictive analytics that help to understand past events and predict future trends. It helps to recognise the current state of an organisation and forecast future prospects, without necessarily addressing the fundamental causes of problems or providing specific recommendations. Economic analysis is important for systematically examining business processes, assessing an organisation’s financial position, and identifying opportunities for growth. In an uncertain environment, analysts use statistical models and other methods to break down complex economic realities into manageable components. Integrating economic analysis into a broader context that includes diagnostic elements helps to increase the predictive power of economic models and strategies. Economic analysis not only helps to understand the current state of affairs, but also provides a perspective for proactive decision-making.

Diagnostics, on the other hand, seeks to identify the origin of trends, correlations between variables, and potential causes of problems observed in an organisation [6]. This involves a deeper analysis of data, including comparative analysis of historical trends, external market trends and other relevant data to establish cause and effect relationships and identify root causes.

In an uncertain economic environment, the diagnostic aspect becomes key to solving problems that may not be immediately apparent using traditional analytical methods. Economic diagnosticians examine the structural integrity of economic systems, going beyond surface indicators to understand the dynamics that shape economic outcomes. This involves a thorough analysis of policy frameworks, institutional structures and external influences to pinpoint areas that require strategic intervention. In addition, economic diagnostics are forward-looking, emphasising the development of targeted interventions to address identified problems and improve overall economic resilience. This proactive stance is important in an environment marked by uncertainty, as it allows economists to anticipate potential challenges and take steps to mitigate their impact. Diagnostic tools may include scenario analysis, stress testing, and system modelling, which provides a full understanding of how the economic system may respond to various stimuli.

The key difference between diagnostics and analysis lies in the ability of the latter to solve complex real-world problems faced by economists under conditions of uncertainty, providing a qualitative understanding of the processes taking place in the enterprise and developing recommendations that are reliable even in the face of ambiguity and unpredictability. In this context, diagnostics involves a more comprehensive and adaptive approach that combines both quantitative and qualitative methods. It aims to identify hidden factors and their potential impact on economic performance, recognising that economic systems often operate in a dynamic and uncertain environment.

At the same time, it is worth noting that the integration of economic diagnostics with analysis creates a synergistic approach that goes beyond understanding the "what" to determine the "why" and "how" of economic phenomena. While economic analysis identifies and interprets trends, economic diagnostics provides the depth of explanation needed for effective decision-making [6]. Together, they form a powerful framework that allows not only to understand the current economic situation, but also to proactively address challenges and seize opportunities in an uncertain environment.

In view of the above, we can provide our own interpretation of the diagnostic process – it is an analytical process of comprehensive assessment of the operational, investment and financial condition of an enterprise or economic system through the systematic collection, analysis and interpretation of data. This process identifies and assesses key economic indicators, major drivers, endogenous and exogenous factors and influences to diagnose current and potential challenges, opportunities and uncertainties. The purpose of economic diagnostics is to provide practical conclusions and recommendations for making informed decisions, strategic planning and
improving performance, taking into account the diversity and unpredictability of the economic environment. It involves the development of quantitative models, qualitative assessments and scenario analysis to facilitate a holistic understanding of economic dynamics and decision-making. In the face of uncertainty, economic diagnostics is a fundamental tool that promotes adaptability, resource optimisation, risk mitigation and system resilience, ultimately contributing to economic stability and growth.

Along with the definition of the essence of economic diagnostics, the issue of determining its stages in the face of uncertainty is quite relevant in the scientific and practical spheres [7; 4]. Determining the stages of economic diagnostics is necessary for making informed decisions, efficient allocation of resources, developing effective policies, managing risks, promoting continuous improvement, economic stability and growth.

Therefore, it should be noted that the stages of economic diagnostics change depending on the conditions. Specifically, conducting a diagnostic process under conditions of uncertainty takes into account the need for additional levels of analysis and data collection to address the inherent unpredictability and qualitative aspects of economic problems. The inclusion of qualitative data allows for a deeper understanding of the human and contextual factors that influence economic trends. This, in turn, allows for the development of more robust and adaptive solutions to navigate the complexities of an uncertain economic environment. The stages of economic diagnostics should be flexibly adapted to encompass both quantitative and qualitative elements, recognising that economic reality is often multifaceted and influenced by a variety of factors, some of which cannot be fully captured by numbers alone. Understanding the stages of economic diagnostics offers a structured approach to assessing and responding to changing circumstances, ensuring that decisions remain informed and aligned with the goals of the enterprise. Furthermore, knowledge of the stages of the diagnostic process is crucial for the implementation of proactive crisis management, which allows businesses to identify early signs of a potential crisis and take timely corrective measures to minimise adverse effects, promotes a culture of innovation in enterprises and increases their resilience, and enables a proactive approach to identifying economic problems and opportunities to overcome them (Figure 2).

The initial stage of diagnostics in an uncertain environment involves identifying a specific economic problem or deviation that needs to be analysed. This process involves obtaining complete information about the current situation, market dynamics and global events affecting the enterprise. Stakeholder engagement helps to reduce information asymmetry, as it provides valuable insights into their views on the problem and the implications for them.

The next step is the collection and analysis of data, ranging from economic reports and financial indicators to market data, surveys, expert opinions and retrospective data, which creates the analytical basis for the diagnostic process. The peculiarity of this stage is that it is at this stage that the key difference from traditional analysis becomes apparent, in particular the use of both quantitative and qualitative data analysis. This stage lays the foundation for the entire diagnostic process, emphasising the importance of combining numerical data with a broader understanding of the economic context, human behaviour and the causes of economic trends. The integration of quantitative and qualitative data remains a characteristic feature of economic diagnostics, providing a more holistic and effective approach to problem solving and decision making.

Retrospective analysis involves collecting, analysing and reanalysing historical data to identify trends and deviations. This helps to understand the evolution of the situation and use this experience for strategic planning.

Assessment of the current state includes a comprehensive analysis of the financial position, operating activities and market positioning, and takes into account a comparative analysis with industry benchmarks.

Identification of influencing factors involves a systematic study of endogenous and exogenous elements affecting the business to understand the economic context and identify strengths and weaknesses.

Root cause analysis means breaking down complex economic problems into their individual components to identify the underlying causes.

Scenario modelling involves the creation and analysis of hypothetical economic scenarios to assess their impact on the enterprise and develop strategies for adapting to different conditions.

Mathematical models are used to analyse economic conditions and predict future outcomes. They help in assessing the impact of various variables on the economic development of an enterprise.

Modelling techniques, such as sensitivity analysis, scenario planning, probabilistic forecasting, business process modelling, and others, allow us to explore different scenarios and make strategic decisions.

The next stage is the consideration and implementation of proposals and recommendations. The recommendations are based on the results of the analysis, including qualitative and quantitative data, hindsight and modelling results.

The monitoring and evaluation stage ensures ongoing monitoring of the effectiveness of the strategies developed and the achievement of the relevant goals. It includes data collection, analysis, feedback, adjustments and strategic alignment.

Thus, the integrated result of all stages of economic diagnostics under uncertainty is to achieve a holistic understanding of the financial and economic state of the enterprise, its economic health in order to improve the efficiency of the enterprise’s activities and adaptability in an unstable market environment. This enables data-driven strategies, accurate resource allocation, informed risk mitigation and targeted innovation. Ultimately, it enables an enterprise to overcome uncertainty, optimise its performance, gain competitive advantage, foster stakeholder trust, promote resilience and prepare effectively for crises. These combined outcomes create opportunities for increasing enterprise value, sustainability and long-term success in a dynamic economic environment.

In the framework of our study, we propose to apply a mathematical model for diagnosing the financial condition of an enterprise under conditions of uncertainty:

1. State of the system:
$F_t$ – represents the financial position of the enterprise at time $t$.

2. Observations:
$O_t$ – defines the measurements or indicators of the financial condition of the enterprise at time $t$.

3. Model of state change:
The function $f(F_t, A_t, \epsilon_t)$ is used, where:
$A_t$ – possible actions or interventions in the financial state.
$\epsilon_t$ – is a noise term that takes into account uncertainty and random changes.

4. Observation model:
Represented by the function $t_h(F_t, \eta_t)$, where:
$\eta_t$ is the noise term of the observations, taking into account the uncertainty of measurements and possible errors.

5. Bayesian update: we use Bayesian update to estimate the probabilities of different financial states at each time step. The update formula is as follows:
$$P(O_{t \cup t}, A_t) = \frac{P(F_t) \cdot P(O_{t \cup t}, A_t \cup A_{t-1})}{P(O_{t \cup t-1}, A_{t-1})}$$

6. Final stage is to determine the current financial position of the enterprise $F_t$, which is the key element for further analysis. Observations $O_t$ are defined as measurements or indicators of the financial position at a particular point in time. A state transition model is used to predict the future financial position, taking into account possible actions $A_t$ and the noise term $\epsilon_t$.

The observation model takes into account the uncertainty of measurements using the noise term $\eta_t$. The key stage is the Bayesian update, where the probabilities of different financial states are updated based on new observations and actions taken. This allows us to adapt our forecasts to the data and better account for uncertainty. The final stage is the diagnosis, where the current financial state is determined by maximising the probability based on the results of the Bayesian update.

Thus, such a model makes it possible to systematically analyse and forecast the financial position of an enterprise under conditions of uncertainty. The use of machine learning methods, such as classification or regression, can improve the accuracy of diagnostics and help automate the process. Such a model can be adapted to the specific needs and characteristics of the enterprise for maximum efficiency.
Conclusions. Thus, the study highlights the fundamental differences between economic analysis and economic diagnostics, offering a comprehensive definition of the latter. It has been proved that the diagnostic process outlines a more complex approach that is superior to conventional analysis. The authors provide their own definition of the diagnostic process and detail the individual stages of economic diagnostics, emphasising their relevance in the context of uncertainty.

In an economy where adaptability and resilience are important, this study helps to make more informed decisions, allocate resources more optimally and rationally, anticipate and mitigate possible risks and crises, and introduce a culture of innovation, contributing to sustainable economic development. The integration of the diagnostic framework into practical economic scenarios provides benefits beyond theory, thereby forming a strategy for economic success.

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