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Economic approaches to the evaluation of securities and risks of corporate integration associations & societies

The article is devoted to the study of approaches to the assessment of securities and economic risks of corporate integration associations and societies for better use in the formation of prices on the securities market. The main theoretical and legal approaches to the assessment of the market value of shares of domestic enterprises are considered.

The price of shares and other securities is formed by the method of counter-factual analysis, in addition to taking into account the dominant characteristics of shares, it is suggested that, in the absence of a stock exchange quotation, the following information about the issuer of securities is considered key for determining the price. The essence of the algorithm for the transition from the assessment of the entire enterprise to the assessment of previously received equity shares has been clarified; the principles of enterprise rights assessment are analyzed and the approach that best meets the task of determining the object's value within the framework of enterprise rights assessment is established. The process of forming the market value of corporate consolidated partnership shares was analyzed and it was determined that capital can increase or decrease under the influence of macro- and microeconomic factors. Approaches to the evaluation of the securities market, which refers to the developing market, are taken into account, because such markets have proven to be the most vulnerable to the modern process of integration of financial markets and can take the brunt of current and future financial crises and economic risks. Common valuation methods were found to include scenario analysis, sensitivity analysis, discounted flow models, risk analysis, and other financial models.

Considering these risks and evaluating securities helps investors and market participants make investment and asset management rationales. For example, given the risks of corporate integrations, investors may decide to reduce exposure to the shares of a particular company or sector undergoing integration and increase portfolio diversification.

corporate integration, joint stock companies, economic risks, integration associations, corporate management, securities

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Statistical Problems and Imperatives in Wartime: a Critical Analysis

The article highlights the modern perspectives of statistics as a science and its role in various fields of human activity. The article is based on the analysis of current trends in the development of statistics, as well as its significance in the era of the digital revolution and the information age. The prospects of statistics as a science are incredibly promising and diverse, covering different fields and industries. Through a broad analysis of current trends and achievements, this article sheds light on the development of statistics and its potential impact on shaping the future.

As a result of the study, the main prospects for the development of statistics as a science and a field of practical activity were determined, and the key aspects emphasizing its importance were formulated. It has been proven that statistics is a dynamic, evolving discipline with enormous potential for innovation, discovery, and impact on society. The critical analysis of statistical problems and urgent tasks that arise in wartime has been provided. The role of statistics in those military actions is considered, and the application of statistical methods to strategic and tactical decision-making is analyzed. In times of war, statistics face numerous challenges that can complicate the collection, analysis, and interpretation of data.

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During conflict, the role of statistics becomes paramount in informing decision-making, resource allocation, and assessing the impact of military action. However, applying statistical methods in wartime poses unique challenges, from collecting data in a hostile environment to ensuring the accuracy and reliability of analysis in the face of uncertainty and misinformation. This article examines the multifaceted challenges that arise when using statistics in wartime scenarios, highlighting the implications for military strategy, humanitarian efforts, and postwar reconstruction. By addressing these challenges, statisticians can make a significant contribution to improving the effectiveness and ethical conduct of operations in conflict zones.

The prospects for further research in the study of indirect methods and the use of alternative sources of data collection, for the full realization of the functions of statistics in wartime conditions is substantiated.

statistics, war, data collection, decision-making, uncertainty, disinformation

Statement of the problem. Statistics is one of the oldest scientific disciplines, having started its journey as a means of collecting and analyzing data in ancient times to a modern science that is actively used in various spheres of life. In recent decades, statistics has undergone significant changes, becoming a scientific discipline capable of predicting, analyzing, and extracting valuable knowledge from huge amounts of data.

Often referred to as the science of uncertainty, statistics has moved beyond its traditional role as a simple tool for data analysis and has become a cornerstone of scientific research and practical decision-making in modern society. In the modern era, characterized by an unprecedented flow of data and technological advances, statistics promises to reveal valuable insights, guide policy formulation, and spur innovation across sectors.

Statistics operates in both peacetime and wartime, but wartime significantly affects the conditions for realizing its objectives. Statistics plays a crucial role in virtually every aspect of modern warfare, from assessing enemy capabilities to evaluating the effectiveness of military strategies. However, the application of statistical methods in a military environment presents a unique set of challenges that must be carefully navigated to ensure the validity and reliability of analyses. In this article, we explore the challenges that arise when using statistics in times of conflict, ranging from difficulties in data collection to the pervasive presence of uncertainty and misinformation.

Analysis of recent researches and publications. Statistics continues to evolve as a science and remains an enduring tool for analyzing and understanding the world. Its prospects in various fields are enormous, and with the development of technologies and methods of data analysis, its importance will only increase. The prospects for statistics as a science are bright and multifaceted, with opportunities for innovation and impact in a wide range of areas.

Foreign scientists are actively studying all these prospects, challenges and opportunities for statistics. American scientists Bruce G. Lindsay, Jon Kettenring & David O. Siegmund [7] analyze the future of statistics based on research results of the National Science Foundation (USA). Xuming He and Xihong Lin [12] explore challenges and opportunities in statistics and data science in the digital age, William S. Cleveland [10] studies the expansion of technical areas in the field of statistics. Xuming He, David Madigan, Bin Yu, Jon Wellner [11] highlighted the results of research by about 50 scientists on the role of statistics and changes in its scientific and social application. Hossein Hassani, Christina Beneki, Emmanuel Sirimal Silva, Nicolas Vandeput, Dag Oivind Madsen study the prospects for the development of statistics in parallel with the development of data science [8].

These studies highlight the prospects for the development of statistics that apply to any country, including Ukraine, where military operations are taking place. Among the domestic scientists who have studied the problems and prospects of implementing big data in the official statistics of Ukraine under martial law are O. Osaulenko and O. Horobets [4]. O. Parashchiiy believes that Ukraine's economic statistics in wartime slipped into the pre-computer era [5]. It should be noted that at present there are almost no publications on the impact of martial law in Ukraine on statistical research.

Statement of the objective. The purpose of this article is to study the prospects for the development of statistics as a science and the peculiarities of realization of the functions of statistics under martial law.

The main material. Our world increasingly relies on data and computing to create knowledge, make important decisions, and better predict the future. Statistics can be defined as the science of collecting and analyzing data [6]. Global trends in the development of statistics are as follows.

First, it is the development of data analysis methods. With the development of computing technologies and machine learning methods, statistics is finding new tools for analyzing complex data, such as Big Data and multivariate statistical models. The combination of statistics with machine learning and artificial intelligence has revolutionized data analysis, enabling the development of complex predictive models, anomaly detection algorithms, and autonomous decision-making systems. Bayesian statistics has gained popularity in recent years due to its robustness in handling complex data structures, its ability to take into account prior knowledge, and its ability to quantify uncertainty, thus offering a powerful basis for inference and forecasting.

Another important trend in the development of statistics is the expansion of interdisciplinary research. Statistics is becoming more and more in demand in various fields such as biology, medicine, economics, sociology, and even artificial intelligence. Its ability to be adapted and applied in different contexts makes statistics a key tool for modern research.

Another modern challenge in data collection and processing is ethical issues and data transparency. As the amount of data increases, so does the importance of ethical issues related to its collection, storage, and use. Statistics can be used to manipulate data to support certain arguments or interests, which creates ethical issues. Statistics plays a role in ensuring data transparency and protecting personal information, which is becoming increasingly important in the age of digital privacy.

As we navigate a complex era of data, statistics provide a measure of empirical precision, guiding us toward informed decisions, evidence-based policy, and a deeper understanding of the world around us. Through new technologies, interdisciplinary collaboration, and ethical principles, the rise of statistics to the future light continues to unfold, offering endless possibilities for research and improvement. Table 1 indicates the field of activity in which the statistics of others play a significant role.

According to a famous British politician William Harry Ponsonby [9], «The first casualty when war comes is truth». This is manifested, in particular, in the following. Implementation of statistical functions related to data collection and processing during the wartime period has a significant negative external impact, which is manifested in the following:

– *Data collection issues.* One of the main obstacles to conducting statistical analysis during wartime is the collection of accurate and reliable data. In a wartime environment, limited access to areas, the number of people who may be unreachable or require evacuation, and general chaos can complicate data collection. This can lead to incomplete collection and inaccuracy of data, which complicates analysis and decision-making. In conflict zones, access to information is often limited due to security concerns, making it difficult to collect complete data sets. In addition, the reliability of data sources can be compromised by censorship, propaganda, or deliberate disinformation campaigns. The conditions of military conflict can lead to difficulties in data collection, such as the lack of electronic means of communication or data processing, danger to data collectors, and unstable conditions in combat areas. As a result, statisticians must exercise caution when interpreting the available data, given potential biases and inaccuracies.

Table 1 – Perspectives of statistics in various fields

Branch	The role and prospects of statistics
Medicine and health care	Statistics play a key role in the analysis of clinical data, prediction of morbidity, and development of individualized treatment methods. In medical research, statistics are used to analyze the effectiveness of drugs, identify disease patterns, predict the spread of epidemics, and much more. With the advent of personalized medicine and the use of big data in healthcare, statistics are becoming an integral part of medical practice. Statistics will be crucial in analyzing genomic data, identifying biomarkers, and optimizing treatment strategies tailored to individual patients.
Business and economy	In business, statistics are used to analyze markets, forecast demand, optimize production processes, and make strategic decisions. With the development of e-commerce and Big Data, the role of statistics in making strategic decisions in business is becoming more and more important. As businesses increasingly rely on data-driven decision-making, statisticians will have more opportunities to help organizations gain a competitive advantage through data analysis and predictive modeling.
Science and research	Statistics are an integral part of scientific research, helping to identify patterns, test hypotheses, and draw conclusions based on data. With the development of new methods of data analysis, the creation of machine learning algorithms, and artificial intelligence, statistics continues to develop and make a significant contribution to scientific knowledge. As artificial intelligence technologies become more common across industries, statisticians will continue to be in high demand to ensure the reliability and accuracy of these algorithms, as well as to address ethical considerations related to bias and fairness. As interdisciplinary research continues to evolve, statisticians will collaborate with experts in the field to design experiments, analyze data, and draw valid conclusions from complex data sets.
Environmental science	In environmental science, statistics are used to analyze climate data, assess environmental risks, and inform policy decisions. As concerns about climate change and sustainable development increase, statisticians will play an important role in developing models to understand complex ecological systems and evaluate the effectiveness of mitigation strategies.
Education and social sciences	In education, statistics help analyze learning outcomes, evaluate the effectiveness of educational programs, and identify potential problems in learning. In sociology, psychology, and other social sciences, statistics are used to study social phenomena, conduct surveys, analyze public opinion, etc. Statistical methods are used for data analysis in social networks, image processing, and much more. Statistics play a crucial role in the social sciences and public policy for conducting surveys, analyzing social trends, and evaluating the impact of government interventions. Statisticians contribute to evidence-based policy-making by providing rigorous analysis and statistical expertise to address societal issues such as poverty, inequality, and education.

Source: compiled by the authors.

– *Uncertainty and variability.* The unpredictable nature of war introduces considerable uncertainty into statistical analysis. Military conflicts are characterized by rapidly changing circumstances, which makes it difficult to predict outcomes or assess the effectiveness of interventions. In military conflicts, difficulties may arise with the identification and classification of people who have become victims. For example, a large number of displaced, wounded or dead can make it difficult to accurately determine the status of each person. Additionally, the variability inherent in human behavior and decision-making adds another layer of complexity to statistical modeling efforts. Therefore, statisticians must use robust methods to quantify and manage uncertainty in their analyses, ensuring that decision makers are provided with accurate and actionable information.

– *Disinformation and propaganda.* In times of war, disinformation and propaganda are common, influencing public opinion and shaping perceptions of the conflict. Statistical

analysis can be distorted or manipulated to support certain narratives or agendas, undermining the integrity of the data and compromising the validity of the conclusions drawn from it. This may include understating or overstating the number of victims, changing statistics on strategic achievements, or cases of violations of international law. Statisticians must remain vigilant against attempts to manipulate or distort statistical data, using rigorous data validation and fraud detection methods.

– *Ethical considerations.* During the war, ethical dilemmas arise regarding the collection, use, and publication of data on victims, wounded, human rights violations, etc. The use of statistics in wartime raises important ethical considerations, particularly regarding the potential consequences of statistical analysis for the civilian population. Decision makers must weigh the potential benefit of using statistical information for military purposes against the risk of harm to non-combatants. In addition, statisticians have a responsibility to ensure that their analysis is conducted ethically and with due regard to the principles of fairness, transparency, and accountability. Scientists and statisticians have to balance the need for information with the protection of privacy and human dignity.

Let us consider the statistical issues that are specific and closed to the public during wartime.

Wartime presents a number of unique statistical challenges, including loss estimation, forecasting the outcome of combat operations, analysis of military intelligence, and optimization of resource use. Estimation of losses is an important task of military statistics since the correct determination of the number of troops, losses of weapons, and other resources is important for making tactical and strategic decisions. Forecasting the results of military operations requires the use of statistical methods to analyze historical data, model various scenarios, and determine the probabilities of outcomes.

An important factor is the analysis of military intelligence involves the application of statistical methods to interpret a variety of data, including images, signals, reports, and other sources of information about the enemy.

In addition, the use of statistics to optimize the use of resources includes the task of planning the distribution of military equipment, material resources, and human resources, taking into account various factors such as geography, climate, battlefields, and others.

Statistical imperatives in wartime may include the following aspects: assessing the effectiveness of tactical processes based on statistical indicators; forecasting changes in the military situation based on the analysis of statistical data; using statistical models to optimize resource allocation and plan military operations.

Thus, statistical problems and tasks arising during military operations require a special approach and adaptation of statistical methods for specific military situations.

As for our country, the following changes took place in statistics during the two years of the full-scale war. In connection with the full-scale invasion of the Russian Federation on the territory of sovereign Ukraine, the President signed the Decree «On the introduction of martial law in Ukraine» and a number of other legislative acts. One of them the Law of Ukraine «On the Protection of the Interests of the Subjects of Reporting and Other Documents in the Period of martial law or a state of war». This law establishes that for the period of martial law and three months after its cancellation, the submission of any reporting in documentary and electronic forms, including statistical and financial reporting [1].

Therefore, in addition to irreparable losses for Ukraine and each of its residents, the war also caused significant damage to the country's public administration system, including the official statistics bodies, which suspended the collection of most of the primary statistical data and the publication of the corresponding consolidated statistical information.

Today, the official statistics of Ukraine are practically devoid of all the main sources of statistical data, namely: primary data obtained with the help of statistical observations and surveys (from subjects of commercial activity, individuals, households, as well as state structures, public objects facilities, etc.), secondary data from administrative sources, as well as information collected by specialized government agencies.

However, the development of national statistics continues and has clearly defined directions. From January 1, 2023, the Law of Ukraine «On Official Statistics» dated August 16, 2022 No. 2524-IX [2], which was developed on the basis of the European Union framework regulation, came into force, which made it possible to get as close as possible to EU legislation in the field of statistics. The new Law envisages the possibility of creating an IT platform where all processes – from data upload to distribution – are automated, unified, and independent of humans. The use of available data from various state registers is also prioritized to reduce the reporting burden on respondents.

Since June 5, 2023, the website of the State Statistics Service of Ukraine has published a Notice on conducting electronic consultations with the public regarding the draft resolution of the Cabinet of Ministers of Ukraine «On approval of the Program for the Development of Official Statistics until 2028» [3]. The specified Program for the Development of Official Statistics aims, in particular, to ensure the stability of the functioning of the national economy in the conditions of martial law and its further growth and post-war recovery on the latest organizational and technological basis and in cooperation with international partners. As stated in the document, the tasks of the development of state statistics consist of the harmonization of the national statistical system with international and European norms and standards, as well as digital transformation.

Conclusions and prospects for further researches. In general, statistics play an important role in military conflicts, but they also face numerous challenges that require attention and solutions to ensure the objectivity and reliability of data in the most complex environments. The application of statistics in a war setting presents many challenges, from difficulties in data collection to the pervasive presence of uncertainty and misinformation. Addressing these challenges requires a concerted effort by statisticians, military leaders, and policymakers to develop robust methodologies, protect data integrity, and uphold ethical standards. By overcoming these obstacles, statisticians can play a critical role in decision-making, improving the effectiveness of military operations, and mitigating the impact of conflict on civilians.

The prospects for further research are the study of indirect methods and the use of alternative sources of data collection, for the full realization of the functions of statistics in wartime conditions.

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Статистичні проблеми та імперативи у воєнний час: критичний аналіз

Стаття висвітлює сучасні перспективи статистики як науки та її роль різних галузях людської діяльності. В основі статті лежить аналіз поточних тенденцій у розвитку статистики, а також її значущість в епоху цифрової революції та інформаційного віку. Перспективи статистики як науки неймовірно багатообіцяючі та різноманітні, охоплюючи різні сфери та галузі. Завдяки широкому аналізу поточних тенденцій і досягнень ця стаття проливає світло на розвиток статистики та її потенційний вплив на формування майбутнього.

В результаті дослідження визначено основні перспективи розвитку статистики як науки та сфери практичної діяльності, сформульовано ключові аспекти, що підкреслюють її значення. Доведено, що статистика - динамічна дисципліна, що розвивається, та має величезний потенціал для інновацій, відкриттів і впливу на суспільство. Проведено критичний аналіз статистичних проблем та невідкладних завдань, що виникають у воєнний час. Розглядається роль статистики у тих військових діях, і навіть застосування статистичних методів до ухвалення стратегічних і тактичних рішень. Обґрунтовано, що під час війни статистика зіштовхується з численними проблемами, які можуть ускладнити збір, аналіз і інтерпретацію даних. Під час конфлікту роль статистики стає першорядною в інформуванні про прийняття рішень, розподіл ресурсів та оцінку впливу військових дій. Однак застосування статистичних методів під час війни створює унікальні виклики, починаючи від збору даних у ворожому середовищі й закінчуючи забезпеченням точності та надійності аналізу в умовах невизначеності та дезінформації. У цій статті розглядаються багатогранні проблеми, які виникають під час використання статистики під час воєнних сценаріїв, підкреслюючи наслідки для військової стратегії, гуманітарних зусиль і післявоєнної реконструкції. Вирішуючи ці виклики, статистики можуть внести значний внесок у підвищення ефективності та етичного проведення операцій у зонах конфлікту.

Перспективи подальших досліджень вбачаємо в дослідженні непрямих методів та застосування альтернативних джерел збору даних, для повноцінної реалізації функцій статистики в умовах воєнного часу.

статистика, війна, збір даних, прийняття рішень, невизначеність, дезінформація

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Вплив тіньової економіки України на макроекономічні показники та економічну безпеку держави

У статті досліджено вплив вітчизняної тіньової економіки на основні макроекономічні показники розвитку держави та надаються пропозиції щодо зниження обсягів та рівня тіньової економіки України. Систематизовано наукові підходи щодо сутності та чинників тінізації економіки та економічної безпеки. Вивчено досвід роботи міжнародних організацій, спрямованих на боротьбу з відмиванням нелегальних коштів. Виявлено, що тіньова економіка країни в умовах глобалізації є одним із суттєвих екзогенних чинників впливу на економічну безпеку держави. Більшість європейських країн, включаючи Україну, використовують валовий внутрішній продукт (ВВП), як показник обсягу національного виробництва та економічного добробуту суспільства. У статті висвітлені динаміка ВВП та рівень тіньового сектору економіки до ВВП України за весь період незалежності держави.

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