



EUROPEAN CONFERENCE

Conference Proceedings



**IV International Science Conference
«Trends in the development of science as
the main way to replace old
technologies»**

January 27-29, 2025

Plovdiv, Bulgaria

TRENDS IN THE DEVELOPMENT OF SCIENCE AS THE MAIN WAY TO REPLACE OLD TECHNOLOGIES

Abstracts of IV International Scientific and Practical Conference

Plovdiv, Bulgaria
(January 27-29, 2025)

UDC 01.1

ISBN – 9-789-40377-572-2

The IV International scientific and practical conference «Trends in the development of science as the main way to replace old technologies», January 27-29, 2025, Plovdiv, Bulgaria. 250 p.

Text Copyright © 2025 by the European Conference (<https://eu-conf.com/>).

Illustrations © 2025 by the European Conference.

Cover design: European Conference (<https://eu-conf.com/>).

© Cover art: European Conference (<https://eu-conf.com/>).

© All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted, in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher. The content and reliability of the articles are the responsibility of the authors. When using and borrowing materials reference to the publication is required. Collection of scientific articles published is the scientific and practical publication, which contains scientific articles of students, graduate students, Candidates and Doctors of Sciences, research workers and practitioners from Europe, Ukraine and from neighboring countries and beyond. The articles contain the study, reflecting the processes and changes in the structure of modern science. The collection of scientific articles is for students, postgraduate students, doctoral candidates, teachers, researchers, practitioners and people interested in the trends of modern science development.

The recommended citation for this publication is: Khromykh N., Didur O. Antibacterial potential of biosynthesized silver nanoparticles and their conjugates with ceftriaxone. Abstracts of IV International Scientific and Practical Conference. Plovdiv, Bulgaria. Pp. 37-40.

URL: <https://eu-conf.com/en/events/trends-in-the-development-of-science-as-the-main-way-to-replace-old-technologies/>

TABLE OF CONTENTS

AGRICULTURAL SCIENCES		
1.	Астахова Л.Є., Чирко Т.А. ІСТОРІЯ ВИКОРИСТАННЯ ДЕКОРАТИВНИХ ТРАВ'ЯНИСТИХ РОСЛИН У ЛАНДШАФТНОМУ ДИЗАЙНІ	10
2.	Дудка С.Д., Кудла Б.Я. ІННОВАЦІЙНІ МЕТОДИ БОРОТЬБИ ЗІ ШКІДНИКАМИ В ОРГАНІЧНОМУ ЗЕМЛЕРОБСТВІ	15
3.	Крижанівський В.Г. АДАПТИВНІ ВЛАСТИВОСТІ ТА СЕЛЕКЦІЙНА ЦІННІСТЬ СОРТІВ ПШЕНИЦІ М'ЯКОЇ ОЗИМОЇ ЗА ОЗНАКАМИ УРОЖАЙНОСТІ	18
4.	Кудла Б.Я., Дудка С.Д. ТЕХНОЛОГІЯ ВИРОЩУВАННЯ ЛЬОНУ	21
ARCHITECTURE, CONSTRUCTION		
5.	Якименко А. О. ЛІНЕЦЬКИЙ: АВТОРСЬКИЙ ПОГЛЯД НА АКТУАЛЬНІ МІСТОБУДІВНІ ІДЕЇ	24
6.	Олійник Г., Василенко К. ФОТОГРАММЕТРІЯ ТА ТЕХНОЛОГІЇ LIDAR В СИСТЕМІ АРХІТЕКТУРНОЇ ОСВІТИ УКРАЇНИ	30
ART HISTORY		
7.	Бєдний А.І. ОНОВЛЕННЯ БАЯННОГО РЕПЕРТУАРУ ШЛЯХОМ ЗВЕРНЕННЯ ДО ТВОРЧОСТІ КОМПОЗИТОРІВ ІМПРЕСІОНІСТИЧНОЇ СПРЯМОВАНОСТІ	35
BIOLOGY		
8.	Khromykh N., Didur O. ANTIBACTERIAL POTENTIAL OF BIOSYNTHESIZED SILVER NANOPARTICLES AND THEIR CONJUGATES WITH CEFTRIAZONE	37
ECONOMY		
9.	Filatova H., Kravchenko O., Ovcharova N. MODERN SCIENTIFIC APPROACHES TO PUBLIC DEBT MANAGEMENT: REPLACING OUTDATED MECHANISMS THROUGH TECHNOLOGICAL INNOVATION	41

MODERN SCIENTIFIC APPROACHES TO PUBLIC DEBT MANAGEMENT: REPLACING OUTDATED MECHANISMS THROUGH TECHNOLOGICAL INNOVATION

Hanna Filatova

Doctor of Philosophy, Assistant,
Sumy State University

Kravchenko Olena

PhD, Associate Professor,
Sumy State University

Ovcharova Nataliia

PhD, Senior Lecturer,
Sumy State University

Modern technological methods of public debt management in European countries have proven to be effective in difficult economic conditions. In particular, it is common in the EU to create independent debt management agencies that operate based on digitalized platforms for accounting and auctions. Germany, France, and the Netherlands are actively using electronic systems for placing government bonds, where the issuance and trading process is based on standardized protocols of the Bloomberg Auction System or similar tools. In addition, several countries, in cooperation with the European investment banking community, are experimenting with blockchain solutions that speed up transactions, reduce paperwork, and increase the transparency of market operations.

For Ukraine, which is in the midst of a military conflict, there is an urgent need to increase the efficiency and transparency of debt operations to ensure stable financing of defense and social spending. In practice, the Ministry of Finance is already using electronic auctions for the placement of domestic government bonds through the NBU platform. Recently, the possibility of purchasing “military” bonds through the Diia app was launched, which significantly expands the range of investors. However, this electronization covers mainly the front-office component, i.e., the fundraising process. At the same time, back-office operations (accounting, risk management, transaction auditing) often remain manual or are implemented using outdated software. This fragmentation leads to long delays in data processing, duplication of functions, and increases the risk of errors or fraud.

One of the key shortcomings of the current system is the lack of a comprehensive integrated platform for monitoring and analyzing debt operations in real time. The European Union is actively using Big Data Analytics modules that combine information on the macroeconomic situation, international capital market conditions,

auction results, and the current portfolio of government borrowings. Such modules allow a debt agency or the Ministry of Finance to quickly determine the optimal timing for issuing bonds, adjust coupon rates to reflect changes in the yield curve, and forecast long-term debt burdens based on several macro scenarios. In Ukraine, such analytics exist only partially and do not always have a modern software foundation: different agencies have disparate databases, and there is no universal platform for prompt consolidated analysis and quick decision-making.

The next disadvantage is related to imperfect risk management, in particular currency and interest rate risks [2]. In times of war, national currencies experience significant exchange rate fluctuations, and global interest rate hikes increase pressure on sovereign debt. Many EU countries, for example, have established mechanisms for insuring currency fluctuations or hedging through derivatives (swaps, forwards, options) to stabilize debt service costs. In Ukraine, this area is still underdeveloped, as the legislation and technical infrastructure are not fully adapted to derivative transactions for the public sector. At the same time, European practice shows that the competent integration of derivatives into debt policy allows fixing acceptable interest rates or exchange rates for a certain period, protecting the budget from sharp fluctuations.

Special attention should be paid to the prospects of blockchain technologies in the registration and maintenance of government bonds. In the EU, in particular in Luxembourg, there have been successful pilot projects to issue digital bonds based on a distributed ledger, which provides protection against unauthorized interference and allows for real-time monitoring of each transaction. For Ukraine, which faces cyber threats on a daily basis, this format can become a tool for transparently tracking debt volumes, securities circulation, and coupon payments. Domestic legislation already contains certain provisions allowing the use of distributed ledger technologies, but clear procedures for integrating blockchain with the public debt infrastructure have not yet been adopted. In addition, the IT systems of the Ministry of Finance, the NBU, and depository institutions need to be significantly revised to ensure smooth interaction with blockchain platforms.

Another problem is the limited possibilities for automated control over the use of funds from borrowings. In the European approach, when the funds raised are targeted to specific projects (from infrastructure development to military programs), there are digital tracking systems that allow investors and the public to track the direction of funding. In Ukraine, this process is often recorded in the form of general budget items without detailed decoding, and only aggregated figures are available to the public. The introduction of open dashboards based on European standards of ESG (Environmental, Social, and Governance) and GFS (Government Finance Statistics) could increase the confidence of both domestic and foreign investors who want to understand the specific purpose and efficiency of their funds.

The following steps can be recommended to strengthen Ukraine's debt policy following the example of the EU countries. First, create an independent state debt management agency with a clear mandate to implement digital tools. Its functions should include the integrated use of online auctions, Big Data Analytics, automated

risk management, and blockchain [4]. Second, a full-fledged legal framework should be developed for the use of derivatives in the public sector, including interest rate and currency swaps. Such an approach would be in line with the practices of France and Italy, where debt agencies actively use such instruments to optimize debt service costs. Third, it is necessary to integrate all digital data on debt transactions into a single platform, similar to those used in the Nordic countries, where information is stored in a centralized repository and processed according to unified algorithms.

It is also necessary to implement mechanisms of open reporting to the public on the targeted use of credit resources: in many EU countries, there are portals where anyone can find out in a few clicks how much money the government has raised from the sale of bonds, which projects they are directed to, and what economic return is expected. In the Ukrainian context, this will help to increase public trust in times of war, as the population will know where the money raised through “war” bonds goes. Finally, civil servants should be trained in modern debt management technologies. European countries are actively investing in training on the use of specialized software for debt analytics, and are also exploring the possibilities of introducing artificial intelligence. In Ukraine, there are still limited opportunities for such training, given the shortage of resources in wartime, but cooperation with international partners and grant projects could partially solve this problem.

To summarize, even amid the military conflict, Ukraine has the prospect of a technological breakthrough in public debt management if it adopts the best European practices and adapts them to its own realities. Creating a single digital space for transactions with government securities, introducing modern analytical tools, regulating derivatives, and being open in the use of borrowed funds are concrete steps that will help strengthen investor confidence, ensure efficient use of resources, and gradually reduce the debt burden on the economy. The main thing is to be guided by the principles of transparency, scientific validity and rapid adaptation to constantly changing conditions, as these principles underlie an effective debt policy in Europe.

Acknowledgment. Prepared as part of a research project 101127602-EUEPDM-ERASMUS-JMO-2023-HEI-TCH-RSCH – «EU experience in public debt management: conclusions for Ukraine in the war and post-war period». *However, the views and opinions expressed are those of the authors alone and do not necessarily reflect the views of the European Union or the European Executive Agency for Education and Culture (EACEA). Neither the European Union nor EACEA can be held responsible for them.*

References:

1. Ministry of Finance of Ukraine. (n.d.). Public debt and state-guaranteed debt. URL: <https://mof.gov.ua/uk/derzhavnij-borg-ta-garantovanij-derzhavju-borg>
2. Sochka K. Public debt of Ukraine: current realities and problems. *Acta Academiae Beregsasiensis. Economics*. 2022. Vol. 2. DOI: 10.58423/2786-6742/2022-2-172-183.
3. World Bank. (n.b.). Government Debt and Risk Management Program: World Bank Publications. Retrieved from

ECONOMY
TRENDS IN THE DEVELOPMENT OF SCIENCE AS THE MAIN WAY TO REPLACE OLD
TECHNOLOGIES

<https://www.worldbank.org/en/topic/debt/brief/government-debt-and-risk-management-program>

4. European Investment Bank. (2021). EIB issues first digital bond on a public blockchain. Retrieved from <https://www.eib.org/en/press/all/2021-141-european-investment-bank-eib-issues-its-first-ever-digital-bond-on-a-public-blockchain>

Scientific publications

MATERIALS

The IV International Scientific and Practical Conference
«Trends in the development of science as the main way to replace old technologies»

Plovdiv, Bulgaria. 250 p.
(January 27-29, 2025)