

INTERNATIONAL SCIENTIFIC CO-OPERATION AND ECONOMIC INFLUENCE ON UKRAINIAN SCIENTIFIC LEGISLATION

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Abstract. The article underscores the fact that pivotal elements of international legal collaboration in the context of scientific endeavours, pertinent research, and exploration have yet to attain a systematic framework. This is not only the case in the context of modern international public law, but also in relation to the implementation of relevant supranational requirements in Ukrainian legislation, which has arisen from international treaty interactions involving Ukraine. The author has demonstrated that, despite the existence of relevant analyses of supranational standards for scientific co-operation in the works of European and American researchers, particularly concerning treaties on scientific collaboration and their national implementation, these issues have not been extensively explored within the framework of Ukrainian legislation. Concurrently, it is imperative to undertake a thorough and comprehensive examination of the models and formats pertaining to the implementation of universal and European treaty models of supranational influence on scientific research and Ukrainian laws and regulations. The article introduces an economic dimension by analysing the potential impact of international scientific co-operation on the national economy, with a particular focus on the ways in which the effective integration of international standards can enhance Ukraine's economic competitiveness in global scientific and technological markets. The paper elucidates the pivotal role of scientific research as a catalyst for economic growth and innovation. It illustrates the economic importance of harmonising national legislation with international treaty models to optimise scientific funding, resource allocation and technological advancement. The article's primary focus is on the reflection of aspects of international scientific interaction in national legal regulations concerning scientific research. The objective is to identify the characteristics of the implementation of pertinent international standards into the national legal framework, including their evolution, systematic approach, and classification. The article provides a comprehensive analysis of the challenges and paradoxes encountered by Ukraine in the process of integrating universal and European standards for scientific activity and co-operation into its national legal framework, with a view to establishing a sustainable process. It also examines the dynamics of the grounds and format for improving national legislation. In this study, the author employed a range of analytical techniques, including programmatic, predictive, formal-legal, hermeneutic, comparative, and systemic methods, to examine the relevant Ukrainian legislative acts. Furthermore, structural methods, a comprehensive methodology of analysis and synthesis, and approaches of scientific induction and deduction were employed. The author's findings indicate that Ukraine's current legislative framework governing science and scientific activities exhibits a lack of depth and inconsistency in its regulation of international scientific co-operation and international scientific and technical collaboration. Many gaps in the Law of Ukraine "On Scientific and Scientific-Technical Activities" are partially filled by the norms of subordinate acts, primarily governmental ones. Nevertheless, Ukrainian legislation stipulates that international co-operation is to be regulated and guaranteed not directly with the entities engaged in scientific and scientific-technical activities, but rather with the relevant Ministry and the National Research Foundation of Ukraine. The author observed that this not only constrains the practical possibilities regarding academic freedom but also negates the normative foundation for international scientific collaboration coordinated by other central authorities in Ukraine, particularly in the security and defence sectors. In the current context, this appears to be a markedly adverse factor. Moreover, the absence of alignment with international norms and economic

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incentives may result in a reduction of Ukraine's capacity to attract foreign investments and participate in global scientific networks, which could ultimately impede economic development.

Keywords: interagency agreements, science, scientific research, scientific projects, scientific and technical co-operation.

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1. Introduction

The pivotal elements of international legal collaboration in the sphere of scientific endeavour, pertinent research, and exploration have yet to attain a systemic format and comprehensive dimension within the domestic legal doctrine. This is not only the case in the context of modern international public law, but also in the implementation of relevant supranational requirements into Ukrainian legislation as part of Ukraine's system of international treaty interactions.

In the contemporary globalised world, international scientific co-operation plays a pivotal role in advancing scientific knowledge and fostering economic growth. The nexus between science, technology, and economics has become increasingly evident as nations endeavor to enhance their global competitiveness through innovation and research. As Ukraine incorporates international standards into its scientific legislation, it is imperative not to overlook the economic implications of this process. Effective international co-operation in science has the potential to stimulate economic growth at the national level through the attraction of foreign investment, the promotion of technological advancement and the enhancement of the overall innovation ecosystem. In light of these considerations, the article introduces an economic perspective to elucidate the potential for national scientific legislation to be aligned with international treaty models to drive economic benefits. These benefits may include improvements in the allocation of resources, enhancements in funding mechanisms, and increased participation in global research markets.

Despite the presence of analyses of supranational norms of scientific co-operation in the works of European and American authors, especially with regard to scientific co-operation treaties and their national implementation, these issues have not been the subject of scientific research in the context of Ukrainian legislation. The lack of a systematic approach to addressing these issues puts Ukraine at a potential disadvantage in the global scientific and economic arena. As scientific co-operation becomes increasingly important to the global economy, the integration of international standards into Ukrainian law presents both opportunities and challenges for national development.

At the same time, it is difficult to overestimate the importance of a systematic and comprehensive

analysis of the relevant models and formats for the implementation of universal and European treaty models of supranational influence on scientific research in Ukrainian legislation and regulatory framework. Bringing Ukraine's legal and regulatory framework in line with international standards also has economic potential, facilitating access to international research networks, increasing competitiveness in global markets, and promoting innovation that can lead to economic growth. This is particularly important in areas such as technological innovation, where research is a driving force for industrial development and economic productivity.

Thus, the article focuses on the reflection of aspects of international scientific interaction in national legal regulations on scientific research. The aim is to identify the specific features of the implementation of relevant international standards into the national legal model, their development, systematic approach and classification. In addition, the article considers the economic benefits of such legal integration, particularly in terms of economic modernisation, international investment in research and development, and the growth of innovation-related sectors. The article comprehensively examines the challenges and paradoxes that Ukraine has encountered in the context of incorporating universal and European standards for scientific activity and co-operation into national legal acts as part of an ongoing process, as well as the dynamics of the foundation and format for improving national legislation.

The *aim of this article* is to analyse and systematise the processes of implementation of international standards of scientific co-operation into the national legal framework of Ukraine, as well as to examine the economic impact of such integration on the national innovation system, competitiveness and economic growth.

The *object of the study* is international legal co-operation in the field of scientific activity and its regulatory framework in the context of Ukrainian legislation.

The *subject of the study* is the mechanisms, processes and challenges of implementing international standards of scientific co-operation in the national legislation of Ukraine, as well as the economic consequences of these processes.

To achieve the aim of the study, the following key research tasks are identified:

To analyse the main challenges faced by Ukraine on the way to implementing international standards of scientific co-operation into the national legal model, while considering the potential economic benefits of successful integration.

To outline the forms and priorities of implementing international standards of scientific co-operation into national legal algorithms, as well as how they are aligned with Ukraine's economic growth strategies.

To study the role of bylaws in the implementation of international standards of scientific co-operation in the national legal model and their potential to stimulate economic benefits.

To determine the peculiarities of developing regulatory and legal support for the types, structure and mechanisms for implementing international standards of scientific co-operation in national legal acts, including economic incentives that may arise as a result of international co-operation.

2. Methodology

In this scientific article, the author employs a range of methods to analyse the legislative acts of Ukraine concerning science and scientific activity, and their alignment with international standards. A combination of formal-legal, programmatic, predictive, hermeneutic, comparative, and systemic methods was employed to examine the processes of implementing international scientific co-operation into Ukrainian legislation. These methods facilitated an investigation of both the legal framework and the broader economic implications of this integration, particularly the impact on Ukraine's scientific and technological sectors and its economic competitiveness.

In order to achieve the research objectives, a systematic, comprehensive and comparative analysis was conducted on existing and draft regulatory acts in the field of science. This is a key component of Ukraine's efforts to comply with international treaties and regulations. The formal-legal and hermeneutic methods were of great importance for the interpretation of the legal texts and the comprehension of the manner in which international scientific co-operation is regulated within the national legal framework. Furthermore, these methods enabled the evaluation of the extent to which the legislative provisions align with international economic incentives for innovation and scientific collaboration.

The author employed a combination of structural and comparative methodologies to examine the particular challenges and paradoxes that Ukraine encounters in the process of adopting supranational standards for scientific regulation. This encompasses an examination of the deficiencies and inconsistencies in the implementation of these standards, as well as an investigation into the potential economic consequences

of inadequate regulatory frameworks on Ukraine's capacity to engage in global research markets.

The investigation of the development of normative provisions for the types, structure, and mechanisms of implementing international standards of scientific co-operation into national legal acts employed a combination of structural and comparative methods. These methods proved particularly efficacious in identifying the manner in which international regulations can be translated into national policies that stimulate economic growth through scientific and technological innovation.

In order to identify the forms and priorities for the implementation of scientific co-operation standards into Ukraine's national law, the author employed a combination of programmatic and systemic methods, supported by scientific deduction and induction. These approaches facilitated the delineation of legislative pathways for the alignment of Ukrainian laws with international standards, underscoring the economic advantages of streamlined international scientific co-operation. These include improved access to funding, augmented investment in research and development, and enhanced participation in global innovation networks.

The principal sources for this research comprised authentic texts of Ukrainian legal regulations, which were subjected to systematic review and comparison with international norms. In view of the dynamic nature of Ukrainian legislation and the evolving landscape of international scientific co-operation, it was essential to conduct a comprehensive and consistent structural analysis of both existing laws and draft regulations. This entailed an examination of the legal provisions pertaining to science and scientific-technical activities, with due consideration given to the economic impact of these regulations on innovation and national development.

The primary challenge identified in the study is the constant transformation of normative acts in Ukraine, where the future direction of draft laws is often uncertain. It was thus necessary to undertake a systematic comparison of organisational and functional models with the actual state of affairs, as reflected in open sources and real-world practices. This enabled the research to assess the extent to which Ukraine's legal framework facilitates scientific collaboration and economic growth, and to identify areas where national legislation may require adjustment to align with global standards for research and innovation.

3. Recent Research and Findings

A comprehensive review of Ukrainian legislation is required in order to analyse the state and forms of implementing international standards in scientific activity and co-operation. Such a review should not

only consider the legal and organisational mechanisms in place, but also the economic aspects, which have become crucial in the context of countering large-scale Russian aggression and promoting international scientific collaboration.

A notable illustration is the Regulation "On Approval of the Regulation on the Organisation of Scientific and Technical Activities in the System of the Ministry of Defence of Ukraine," which was endorsed by departmental decree on July 16, 2024, under the number 480. It is notable that this regulation does not include any provisions for international co-operation (The Order of the Ministry of Defence of Ukraine "On Approval of the Regulation on the Organisation of Scientific and Scientific-Technical Activities in the System of the Ministry of Defence of Ukraine", 2024), despite the fact that Ukraine has active partnerships with other states and is integrated into NATO systems. The exclusion of these partnerships has considerable economic implications, as international scientific collaboration can enhance technological and defence capabilities through the pooling of resources and the conduct of joint research.

Furthermore, the Military Science Council of the Ministry of Defence, the principal advisory body for military science development, is currently lacking in specified authority for international collaboration. This represents a cause for concern, as international scientific collaboration, particularly in the field of defence technologies and innovations, has the potential to result in cost savings and enhanced efficiency. Furthermore, the planning and funding mechanisms of scientific activities do not make reference to international co-operation, which further constrains Ukraine's capacity to integrate global scientific advancements into its national defence research and development.

The Law of Ukraine "On Scientific and Scientific-Technical Activity", adopted on November 26, 2015, No. 848-VIII (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015), and subsequent regulatory acts also show limited focus on international collaboration, particularly in terms of economic opportunities. Article 1 of this legislation defines the terms "scientist," "scientific institution," and "scientific result," yet it omits any reference to international or foreign collaboration. This represents a significant omission, given that international collaboration can yield substantial economic benefits, including increased access to global funding sources, participation in multinational research projects, and the international commercialisation of scientific outputs.

It is notable that the legal definition of a "grant" does permit the involvement of foreign or international organisations, thereby introducing an economic dimension through the potential expansion of financial

resources available to Ukrainian researchers. The incorporation of the European Research Area (ERA) into the legal framework aligns Ukraine's scientific policy with the EU's, creating further economic incentives through access to European funding, researcher mobility, and international research networks (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Notwithstanding the aforementioned opportunities, Article 2 of the Law, which delineates the purpose and objectives of scientific activity in Ukraine, does not explicitly mention international co-operation. This represents a missed opportunity, as the formation of stronger international partnerships could facilitate economic growth through the promotion of innovation, technology transfer and access to new markets. Nevertheless, Article 45 identifies the integration of Ukraine's research and development sector into the global scientific community and the ERA as one of the key objectives of state policy. This integration is expected to facilitate economic growth by leveraging global scientific infrastructure (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Although Article 3 enumerates international agreements as part of Ukraine's legislative framework, the exclusion of numerous intergovernmental and interagency agreements, including those pertaining to scientific and technical collaboration, constrains the potential economic benefits that could be derived from such partnerships. This limitation highlights the necessity for legislative reforms to more effectively integrate international co-operation, which could enhance the country's economic resilience and scientific competitiveness.

The absence of international co-operation provisions in Articles 5, 6, and 9, which define the rights and responsibilities of scientists and heads of scientific institutions, represents a significant obstacle to the potential economic benefits that could arise from collaborative research efforts and joint ventures with international partners. Furthermore, this impedes the capacity of Ukrainian researchers to engage in global initiatives, which frequently offer considerable financial resources and potential for innovation.

In contrast, Articles 8 and 15 provide an insight into the potential for international collaboration, enabling the involvement of foreign scientists in the supervisory boards of major state laboratories and scientific institutions. This could facilitate economically advantageous partnerships and shared research costs. Furthermore, Article 10 bestows upon scientific councils the authority to nominate meritorious research for international accolades. This could foster global recognition, thereby enhancing Ukraine's reputation in the international scientific community and attracting further economic investments.

The Model Regulations on the Council of Young Scientists, approved by the Cabinet of Ministers on November 16, 2016 (No. 822), serve to enhance the international dimension by facilitating integration into global and ERA scientific communities. The aforementioned inclusion serves to foster economic opportunities through the establishment of professional contacts, joint research projects, and international educational events (The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Model Regulation on the Council of Young Scientists at Executive Authorities", 2016).

Nevertheless, Article 17 of the legislation does not explicitly confer upon the National Academy of Sciences of Ukraine (NASU) the authority to engage in international collaboration, which constrains the economic potential of NASU's scientific partnerships. Notwithstanding the aforementioned considerations, the NASU Charter, which is referenced in the pertinent legislation, delineates NASU's international activities, including collaborative endeavours that could potentially yield substantial economic returns (Tytska & Babin, 2024).

The Statute enumerates the NASU's principal responsibilities, which include conducting cutting-edge fundamental and applied research in pivotal scientific domains and fostering the integration of national intellectual capital into the global scientific community. Furthermore, Article 45 of the Statute authorises the NASU Presidium "in the established manner" to facilitate scientific relations with foreign scientific institutions, establish international scientific and technical connections, and conclude relevant agreements and contracts.

In order to fulfil its duties, NASU, in accordance with Article 12 of the Statute, is required to engage in international scientific and technical collaboration, conclude agreements with foreign scientific institutions, and participate in international scientific organisations, including as a national member. Moreover, Article 18 of the NASU Statute outlines the criteria for foreign members of NASU, who may be elected as "scientists – citizens of other countries whose scientific work has received recognition from the international scientific community and who significantly contribute to the development of NASU's international scientific relations" (Charter of the National Academy of Sciences of Ukraine, 2002).

In accordance with Article 35 of the NASU Statute, candidates for foreign membership in NASU are nominated for vacancies opened by the NASU Presidium by the general assemblies of departments and are elected by the NASU General Assembly. In the context of elections for foreign members of NASU, both full members and corresponding members of NASU are eligible to participate. The electoral process is deemed valid if a minimum of two-thirds

of the members are present. In order for a candidate to be considered elected, they must receive at least two-thirds of the votes cast by NASU members participating in the voting process, which may also be conducted in an open manner.

Article 20 provides for certain specifics regarding the activities of the National Council of Ukraine for the Development of Science and Technology, but only in the context of preparing proposals for "the integration of Ukrainian science into the world scientific space and the European Research Area (ERA), taking into account national interests", as well as including in its annual report issues on "the state of implementation by Ukraine of the ERA priorities and submitting proposals for the plan of their implementation for the next year" (Shaver, 2015).

It is evident that the authors of the Law have not clearly defined the mutual significance of the ERA priorities and national interests. Furthermore, the Law does not grant relevant international functions to the Scientific or Administrative Committees of the National Council. Further insight into the international dimension of scientific activity can be gleaned from Article 22 of the Law, which pertains to the activities of the Identification Committee on Science. This article stipulates that proposals for candidates to the aforementioned Committee may also be submitted by foreign scientific institutions and international science councils (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

In order to obtain such proposals, the Ministry of Education and Science of Ukraine (hereinafter referred to as the MESU) is authorised by this article of the Law to send requests to the scientific committees of the European Commission and "public scientific organisations representing the national and global scientific community" to submit proposals for candidates for membership in the Identification Committee. Furthermore, the criteria for membership of the Committee necessitate the ranking of Ukrainian scientists according to the Hirsch index, based on one of the most frequently utilised international scientometric databases, in addition to experience in the leadership of international projects. Additionally, Article 28-1 of the Law makes reference to "international peer-reviewed scientific publications" in the context of conferring the degree of Doctor of Sciences.

The issue of international co-operation is more comprehensively delineated in Article 49 of the Law, which pertains to the National Research Foundation of Ukraine. The stated objective of this Foundation is to facilitate the international exchange of information and scientists. According to these provisions of the Law, the National Foundation may "enter into agreements with a foreign and/or international foundation, company, institution, organisation or association, on the basis of an agreement between

the National Foundation and such structures, for the provision of grants, including on the basis of the results of joint competitive project selections", and also supervise their implementation. In order to achieve this objective, the National Foundation has been granted the authority to enter into bilateral or multilateral agreements with foreign entities, including memoranda of understanding, protocols, and annexes to protocols, and to implement joint projects with them (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Furthermore, the National Foundation has been granted the authority to engage the services of foreign scientists, with their consent, in the evaluation of scientific and scientific-technical projects submitted for competitive selection. Additionally, it is permitted to participate in international scientific and technical co-operation, particularly in international bilateral and multilateral intergovernmental scientific programmes. It may also involve "external experts" in its auxiliary bodies and "ensure the implementation of EU research and innovation programmes or equivalent programmes in Ukraine". The legislation does not provide a distinct delineation of the respective authority of the Scientific Council and the Head of the National Foundation. However, it does empower the Supervisory Board to determine the foundation's involvement in international organisations that provide financial support for research (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

It is noteworthy that the issue of international and foreign co-operation is not directly addressed in Articles 33 and 34 of the Law, which regulate aspects of scientific business trips and scientific internships. With regard to the latter, the Law merely states that "the receiving party may be a non-resident of Ukraine". The international dimension of these processes is only indirectly implied in Article 36 of the Law, which provides for forms of motivation for young scientists, such as "financing internships at leading scientific institutions, including abroad" and "financing scientific business trips, including international ones, to participate in scientific events". In addition, this article mentions "foreign clients of works" in the context of remuneration of scientific workers (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Moreover, in Section IV of the Law, which deals with the powers of public authorities, the international dimension of activity is assigned exclusively to the Ministry of Education and Science of Ukraine (MESU), which, according to Article 42 of the Act, is required to:

- Coordinate international scientific and technical co-operation, ensuring "the fulfilment of obligations undertaken under international treaties of Ukraine on issues within its competence";

- ensure the implementation of international scientific and technical programmes and projects in accordance with international agreements;
- conclude, in accordance with the Law, international agreements on co-operation in the field of scientific and technical activities and develop draft intergovernmental programmes to ensure the implementation of such international agreements;
- ensure the integration of national science into the global scientific space and the European Research Area (ERA) while preserving and protecting national priorities;
- secure the fulfilment of obligations arising from Ukraine's membership in international organisations in the field of scientific and technical activities;
- interact "in accordance with the established procedure with the relevant authorities of foreign states and international organisations" (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Particularly noteworthy is the absence of references to international co-operation in Articles 43 and 44 of the Law, which deal with the powers of other central, regional and local executive authorities. This absence, which is in direct contrast to interagency agreements concluded outside the MESU over the past thirty years, may explain the lack of references to the international component in the aforementioned Regulation of 2024 No. 480 (The Order of the Ministry of Defence of Ukraine "On Approval of the Regulation on the Organisation of Scientific and Scientific-Technical Activities in the System of the Ministry of Defence of Ukraine", 2024).

Nevertheless, among the principles of state management and regulation in the field of scientific and scientific-technical activities, Article 46 of the Law enumerates the utilisation of the achievements of world science, the opportunities of international scientific co-operation, and openness to international scientific collaboration. Furthermore, the aforementioned principles include the fostering of technical co-operation, as well as the integration of Ukrainian science into the global scientific space and the ERA. In addition, the Law stipulates the protection of national security interests (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Regarding the financing of scientific and technical activities, Articles 47 and 48 of the Law provide for the receipt of funds from "foreign customers of works, grants and other sources not prohibited by legislation" and mention the need to "ensure by 2025 an increase in funding for science from all sources to 3 per cent of gross domestic product – the target set by the EU Lisbon Strategy" (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Concurrently, the legislation does not contemplate an international dimension with respect to scientific and scientific-technical data, scientific and scientific-technical expertise, or targeted scientific and scientific-technical initiatives. Instead, it refers to the pertinent legislation of Ukraine. The following legislative acts are relevant in this context: "On State Target Programmes", "On Scientific and Scientific-Technical Expertise", "On Scientific and Technical Information", "On Priority Branches of Science and Technology Development", and "On Government Regulation of Activities in the Field of Technology Transfer" (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

However, the Law contains a separate Article 66 entitled "State Support for International Scientific and Scientific-Technical Co-operation", which guarantees the National Research Foundation (NRF) and entities engaged in scientific and technological activities relevant opportunities for "free and equal relations" with foreign and international structures, "provided that these relations do not contradict the legislation of Ukraine". Furthermore, these structures are entitled to participate in the activities of foreign and international scientific societies, associations, and unions as their members (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

The forms of international scientific and scientific-technical co-operation outlined in this article include the following:

- Joint scientific research, scientific and technical programmes and "co-operative development", as well as joint coordination agreements and agreements with organisations of foreign states or international organisations;
- participation in international research programmes, including the EU Framework Programmes for Research and Innovation;
- mutual exchange of scientific, scientific-pedagogical and scientific-technical personnel and joint training of specialists;
- joint research and development with "international teams of specialists, international institutions and joint ventures";
- international conferences, congresses and symposia;
- use of consolidated international information funds and databases, mutual exchange of scientific and technical information (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

With regard to state support for integration into the European Research Area (ERA), this article of the Law effectively reproduces the priorities established in EU acts concerning "optimising international co-operation to address the global challenges facing humanity," participation in framework and joint international programmes of the EU, alignment of the strategy for the establishment of state research

infrastructures with the roadmap for European research infrastructures; creation of favourable conditions for the mobility of researchers, ensuring gender equality, and "full exchange, transfer, and access to scientific knowledge" (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

Furthermore, Article 66 bestows upon MESU the authority to determine the procedure for the registration of international scientific-technical programmes and projects implemented within the framework of international scientific-technical co-operation by Ukrainian scientists, as well as grants provided under such co-operation, and to conduct such state registration. Furthermore, this article offers certain assurances regarding the financing of international technical programmes and projects, particularly with regard to the handling of foreign currency receipts and budget payments for expenses (The Law of Ukraine "On Scientific and Scientific-Technical Activities", 2015).

It is noteworthy that in June 2024, parliamentary resolutions No. 3800-IX (2024) and No. 3802-IX (2026) were adopted as a basis for government Draft Laws No. 10218 and No. 10424, which propose amendments to the Law, including those pertaining to international co-operation. In particular, Draft Law No. 10218 (2023) proposes the inclusion of definitions of postdoctoral researchers, open science, metadata, optimised research data and the principles of proper management of research data (FAIR principles), which effectively implement the corresponding standards of EU legislation.

Moreover, Draft Law No. 10218 provides for the establishment of a Register of Research Infrastructures, which will facilitate their entry into international associations of research infrastructures. In this context, the project proposes that the remit of national scientific centres should be expanded to include participation in international associations of research infrastructures and the promotion of international scientific-technical co-operation. Furthermore, it suggests that the duties of state key laboratories should be extended to encompass participation in joint scientific research, international scientific-technical co-operation, the mutual exchange of scientific and scientific-technical information, and international and state research infrastructures and/or their associations (The Draft Law of Ukraine "On Amendments to the Law of Ukraine 'On Scientific and Scientific-Technical Activities' Regarding Research Infrastructure and Support for Young Scientists", 2023).

Additionally, Draft Law No. 10218 also establishes as a characteristic of state key laboratories for basic scientific research that they support "competitive basic scientific research at the international level in order to increase the international authority of the state in specific fields of scientific research and integrate

scientists into international research infrastructures". At the same time, for similar laboratories of applied scientific research, it establishes the characteristic of supporting "competitive applied scientific research and development for the commercialisation of research results by scientists and other subjects of innovative activity and their implementation in the national and international markets" (The Draft Law of Ukraine "On Amendments to the Law of Ukraine 'On Scientific and Scientific-Technical Activities' Regarding Research Infrastructure and Support for Young Scientists", 2023).

It is worth noting that despite the absence of references to international co-operation of state key laboratories in the current version of the Law, this issue is somewhat regulated by Resolution of the Cabinet of Ministers of Ukraine No. 607 of July 10, 2019, which approved the Model Regulation on the State Key Laboratory and the Model Regulation on the Academic Council and Supervisory Board of such a laboratory. This Resolution No. 607 assigns the laboratory tasks to engage in international scientific and technical co-operation, conduct joint scientific research, engage in mutual exchange of scientific and scientific-technical information, and participate in international and state research infrastructures.

Resolution No. 607 grants the laboratories the authority to engage in the implementation of international scientific and technical programmes and projects, including the conclusion of agreements and contracts with foreign organisations, participation in the activities of foreign and international scientific societies, associations, unions and federations, the conduct of joint research and development within the framework of international scientific and technical co-operation based on contracts, the organisation of international scientific forums, congresses, symposia, conferences and thematic scientific seminars, and the promotion of joint training of specialists within the framework of international scientific and technical co-operation (The Resolution of the Cabinet of Ministers of Ukraine "Issues of State Key Laboratories", 2019).

In addition, Resolution No. 607 stipulates that the Academic Council of the State Key Laboratory should promote international scientific and technical co-operation, mutual exchange of scientific and scientific and technical information, use of consolidated international information funds and databases; nominate outstanding scientific works for international awards, medals and other forms of recognition. For the Supervisory Board of the State Key Laboratory, this resolution emphasises the need to support the laboratory's activities to "integrate into the global scientific space, search for ways to expand and improve international scientific and technical co-operation". To this end, the Supervisory Board

may "propose, taking into account international requirements, criteria for assessing the results of the laboratory's activities" (The Resolution of the Cabinet of Ministers of Ukraine "Issues of State Key Laboratories", 2019).

In turn, Draft Law No. 10424 (2024) establishes a category for the strategic development plan of a research institution, which should be developed for five years by a candidate for the position of head of a state research institution. This plan should include, among other things, "forecast indicators on the number of grant applications submitted and registered and/or grants received in the framework of international co-operation projects". In addition, it is proposed that the newly elected head of the research institution be given the task of "facilitating the acquisition of extra-budgetary funding for scientific (scientific-technical) work".

Concurrently, the extant Methodological Recommendations on the particulars of selecting the head of a state scientific institution, sanctioned by the Cabinet of Ministers of Ukraine Resolution No. 998 dated December 14, 2016, are devoid of any stipulations pertaining to international collaboration. Similarly, the Regulations on the certification of scientific workers, approved by the Cabinet of Ministers of Ukraine Resolution No. 1475 dated August 13, 1999, do not include any provisions pertaining to international interaction. Similarly, there is no mention of international co-operation in the current Regulation on the National Science Centre, approved by the Cabinet of Ministers of Ukraine by Resolution No. 174 of March 19, 1994, or in the Regulation on the Procedure for Determining Scientific Objects of National Assets and Cancellation of Certain Resolutions of the Cabinet of Ministers of Ukraine No. 723 of October 19, 2016.

4. Further Scientific Pursuits

The implementation of international standards in scientific and scientific-technical activities is of paramount importance for Ukraine, not only in terms of aligning with global practices but also for the country's economic development. The capacity to participate in international scientific networks provides opportunities for securing international funding, attracting investments, and fostering technological innovations that can significantly enhance Ukraine's economic growth. It is therefore recommended that a comprehensive examination of regulatory models and their doctrinal interpretations be conducted, with a view to identifying ways in which Ukraine can more effectively exploit these opportunities.

A key area of future research should be the examination of methods for meeting the requirements

set out in EU programme documents pertaining to scientific activities. These endeavours will assist in aligning Ukraine's legislative framework with its commitments as set forth in EU agreements and programmes, thereby facilitating a more profound integration into the European research space. This will, in turn, facilitate enhanced access for Ukraine to EU research funds, infrastructure and markets, thereby offering substantial economic benefits through collaborative research and innovation.

In this context, the programmatic aspect of international scientific co-operation is of particular significance. The economic potential of enhanced scientific collaboration, including the capacity to attract foreign investment and engage in pioneering research consortia, highlights the necessity for a more comprehensive legal and financial framework. Nevertheless, the existing doctrinal analysis of legal and programmatic regulation remains fragmented and requires a more systematic approach to fully realise its potential in supporting Ukraine's economic and scientific goals.

It is also worth noting that in the last decade of the 20th century and the first decade of the 21st century, Ukraine was actively entering into bilateral intergovernmental agreements in the field of scientific and technological co-operation. These agreements, often related to economic or cultural co-operation, have slowed down considerably in recent years, limiting the potential for economic growth through joint scientific and technological progress. The renewal of such agreements, with an emphasis on programmatic regulation and the establishment of coordinating bodies, will be essential in overcoming the aforementioned challenges and unlocking new economic opportunities.

Furthermore, the bilateral agreements on the mutual recognition of academic degrees and qualifications represent another significant area that necessitates attention. The reinforcement of these agreements could facilitate the involvement of Ukrainian researchers and institutions in the global knowledge economy, thereby promoting international collaboration and innovation.

In light of the persistent hostility demonstrated by the Russian Federation, a comprehensive reassessment and renegotiation of bilateral agreements concluded prior to 2014 in the scientific domain is imperative to effectively counteract the destructive actions perpetrated by the aforementioned entity. Such agreements, if restructured, could prove pivotal in enhancing Ukraine's capacity to respond to provocations and ensuring the integrity of its scientific

collaborations. Furthermore, it is of paramount importance to address negative trends within European scientific structures, such as the abuse of co-operation mechanisms, in order to safeguard Ukraine's interests in the global scientific community.

It is therefore imperative that Ukraine prioritises the systematic enhancement of its mechanisms for the implementation of international standards in scientific and scientific-technical activities, in order to ensure the country's economic resilience and facilitate its scientific advancement. By fostering stronger international collaborations and revising outdated agreements, Ukraine can enhance its capacity to counter external threats, attract foreign investments, and participate in global research networks. Moreover, the ongoing development of legal frameworks will facilitate Ukraine's integration into the European Research Area, stimulating both scientific advancement and economic expansion.

5. Conclusions

The current legislative framework of Ukraine for scientific and scientific-technical activities addresses aspects of international scientific co-operation in an inadequate and inconsistent manner. Gaps in the Law of Ukraine "On Scientific and Scientific-Technical Activities" are only partially filled by subordinate legal acts, mainly issued by the government.

It is noteworthy that the international dimension of scientific co-operation is primarily regulated by the Ministry of Education and Science of Ukraine (MESU) and the National Research Foundation of Ukraine, rather than directly benefiting the subjects of scientific and scientific-technical activities themselves. This regulatory approach not only constrains the practical scope for academic freedom but also undermines the bedrock upon which international scientific collaboration, coordinated by other central government bodies, is based, particularly in critical domains such as security and defence. This limitation has clear negative economic implications, as it reduces the potential for shared scientific advancements, resource pooling, and cost-effective research in strategic sectors.

In order to address these legislative challenges, it is necessary to conduct further scientific research, particularly in view of Ukraine's economic requirements during its process of European integration. Some of these issues are addressed in draft laws submitted to the Verkhovna Rada, but there is still much to be done to ensure that international standards for scientific co-operation are fully integrated into Ukraine's legal and organisational frameworks.

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