

Some study revealed the absence of a generally accepted approach to determining the requirements for the efficiency and effectiveness of technology as an object of civil and economic relations. The need to form recommendations on the content of legal norms and contractual clauses that can be used to fix them in the specified means of regulation is substantiated. It is proved that provided that the current legislation of a particular country fixes universal criteria for determining the effectiveness of technology, this will have a positive impact on their transfer. Thus, on the one hand, all participants in the relationship of technology circulation will receive indicators and an understanding of how to separate an effective technology from pseudo- and outdated technologies. On the other hand, public officials will have a guideline on what technologies cannot be provided with budget funding and support. And the parties to the contractual relationship will be able to fix in the relevant agreements more effective protective clauses, which will help protect their legitimate interests and stabilize investment risks.

Existing approaches to determining the degree of efficiency of technologies were defined and systematized. The analysis of the feasibility and possibility of using macroeconomic and local performance indicators was carried out. General circumstances have been formed that affect the formation of the category of technology efficiency. These include the territory and level of technological development of the implementation area. The suitability and adaptability of the technology to the ability to perform the tasks assigned to it and others.

As a result of the study, universal designs for identifying the effectiveness of the technology were proposed. They are proposed for use in the formation of national and international legislation and protective contractual clauses

Keywords: technology efficiency criteria, technology efficiency, technology effectiveness, technology turnover, technology

FORMATION OF REGULATORY MEANS TO FIX TECHNOLOGY EFFICIENCY CRITERIA FOR ITS FURTHER FINANCING AND BUDGET SUPPORT. THE EXPERIENCE OF UKRAINE AND PROSPECTS FOR IMPROVEMENT UNDER THE CONDITIONS OF MARTIAL LAW

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1. Introduction

It is obvious that the success of any national economy depends on its manufacturing sector. And it, in turn, on what technologies will underlie the production of consumer goods or products for industrial and technical purposes.

Technology is a very complex object of economic relations. On the one hand, it can also become a means of production, on the other hand, it can be embodied in a certain product. The technology plays the role of the basis for the implementation of economic activities and interests investors within the process of investing resources in its development. It is endowed with signs of an object of intellectual property rights and is able to radically change the production capacity of the country. Nevertheless, in any case, the process of

its creation and implementation is complex and risky. Any investor or recipient of funds that will be invested in the process of creating technologies should be convinced that the technology will be created in the end. He must have guarantees that it will provide an opportunity to get the production result for which the investment process took place. Any state that implements measures of direct or indirect support for the intensification of technology transfer should have criteria for distinguishing between pseudo and outdated technologies. Any grant process must be accompanied by the implementation of criteria for its effectiveness.

These needs are realized by many means, techniques, and methods. Sometimes, this is an individual expert study in which representatives of science form personal conclusions about the suitability of technology. Someone uses general

distinguishing criteria based on value judgments. Sometimes general conjuncture studies of the potential properties of the technology are carried out. However, all these techniques are based on one thing – criteria, the achievement of which makes it possible to talk about the effectiveness or inefficiency of a particular technology.

When determining the criteria for the effectiveness of technology, it should be remembered that there is no single coordinated approach to determining the legal nature of the technology. Thus, for post-Soviet countries, it is characteristic of classifying this object as objects of industrial property rights. For the countries of the European Union – taking the technology beyond the legal regulation and assigning it to the list of those objects, the essence, and characteristics of which the parties to the transfer must determine independently. The institutional qualification of technology as an object of economic or civil turnover also affects determining what tasks it should meet. In other words, the question of what effective technology means will depend on it. If the legislation of a particular country, the technology is identified as an object of intellectual property rights. The technology that has received legal protection will be considered effective. If the technology is defined as an innovative product, then its effectiveness will be determined by the ability to form the basis of innovative production. However, if participants in technology transfer are entitled to independently determine the content of its effectiveness, then it will not be possible to achieve a general level of unification of this category. In this case, public authorities, within the framework of the distribution of budget support, will be able to implement corruption offenses, due to the lack of uniform defined criteria.

Within Ukraine, the issue of technology efficiency is extremely acute. This is especially evident under the conditions of open armed aggression of the neighboring state and the orientation of the economy to the needs of the defense sector. In the absence of free resources and funding, business and public authorities should have the tools to effectively manage limited resources.

The main task of scientists, in such circumstances, is to form a holistic complete concept of criteria and requirements for the effectiveness of technology. It is science that should form the criteria for what is an effective technology and indicate to the participants in technology transfer and states how they can be used within the regulatory framework of these relations.

The high level of interest of all participants in technology transfer in the preliminary determination of the potential effectiveness of the technology indicates the need for appropriate scientific research. Since within its limits the relevant universal criteria can be formed, which can become both the basis for further scientific research and the development of national or international legislation. Effective technologies will make it possible for any state to achieve a higher level of its economic development and perform more social functions.

2. Literature review and problem statement

Issues related to determining the effectiveness of technology have been investigated in numerous scientific works and have been the subject of scientific research by many scientists. Work [1] provides a detailed analysis of the effectiveness of production technologies in the context of their

resource cost but does not form universal criteria for this category. In [2], the evaluation of the criteria for determining the effectiveness of investment processes for the implementation of new technologies is provided. The individual approach of technology transfer participants to the methods of determining the effectiveness of their activities has been criticized. However, questions about the formation of general approaches to the identification of this category remained uncovered. Within the framework of work [3], a comprehensive study of the system for assessing the effectiveness of mining technologies was carried out. Among other things, such methods of evaluation as the number of patents received, publications, the level of financial achievements from the use of technology are highlighted. But the authors come to conclusions about the inefficiency of such a system, due to the lack of real indicators of economic growth across the region, and do not provide alternative ways to solve the issue of forming universal performance indicators. Many scientific works consider the effectiveness of technologies through indirect indicators of the number of scientific research, research and development work. In them, as criteria for the effectiveness of their implementation, it is proposed to take the number of scientific works in well-known scientific journals or publications [4], or the number of scientific or scientific-pedagogical workers working at scientific or research institutions involved in technology transfer [5]. In a number of works, it is proved the necessity to use the mathematical application Data Envelopment Analysis (DEA). This method of determining the effectiveness of the technology was used to determine the effectiveness of grant support within research projects [6] and assess the effectiveness of technology implementation within national innovation systems [7].

But among all the above works [1–7] and the proposed direct or indirect ways to determine the degree of effectiveness of technologies, there are no conclusions on the formation of its universal criteria. Questions about what exactly business representatives, officials of public authorities should focus on when deciding on the effectiveness of technology remained unexplored.

All the works analyzed above [1–7] testify to the focus of scientific research on solving individual manifestations of efficiency, within a certain sector, cluster, or individual activity. No works have been identified within which a comprehensive system of universal criteria for determining the effectiveness of technology would be formed. Also, there are no works in which the essence of a special approach to the identification of effective technology under conditions of martial law would be substantiated.

All this suggests that it is expedient to conduct research on the formation of universal criteria, which, if enshrined in legislation or contract, will be able to separate pseudo and outdated technologies. Such criteria will help public authorities to use their financial resources more rationally with budget support for technology.

3. The aim and objectives of the study

The aim of this study is to form universal regulatory structures and contractual clauses that, if used, can help identify the effectiveness of technologies. The obtained achievements can become the basis for changing the national legislation of Ukraine, the legal systems of other countries, contractual clauses.

To accomplish the aim, the following tasks have been set:

- to systematize and classify existing approaches to determining the effectiveness of technology;
- to analyze the circumstances that influence the formation of criteria for the effectiveness of technology;
- to form proposals on the means of regulatory regulation and recommendations for fixing universal criteria for identifying the effectiveness of the technology.

4. The study materials and methods

The object of the study is the state of national and international regulatory support for technology transfer, in terms of regulating the criteria for the effectiveness of technology.

In the course of the study, the provisions of international legislation, current regulations, information from open sources were used. In addition, recommendations of leading international institutions, statistical information, and public information were involved. For the formation of conclusions, formal-logical methods of cognition, methods of modeling, deduction, induction, comparison, methods of formal-logical interpretation of the content of scientific and normative categories and concepts were used.

5. Results of investigating the criteria for the effectiveness of the technology for its further financing and budget support

5.1. Analysis of existing approaches to determining the effectiveness of technology

The etymological meaning of the term “efficiency” (from the English “efficiency”, “performance”, and the German “effektivität f”, “wirkungsgrad m”, wirksamkeit f) is the ratio of the beneficial effect (result) to the cost of obtaining it. Efficiency in general terms is as follows:

- the ability to give the declared result;
- to give a better result than the cost of achieving it;
- to give a result that was unattainable, provided that the objects spent on its achievement are used.

In 1994, the Organization for Economic Co-operation and Development (OECD) formed the main recommendations on the effectiveness of technology [8]. As the main criterion for determining the effectiveness of technology, a formal indicator was chosen – the number of patents issued to protect intellectual property rights for the technology. Also, within the framework of the proposed approach, it was proposed to investigate the content of patents, according to the following criteria:

- patenting by type of inventor, firms, or groups of firms;
- applications in one or more branches of technology;
- patent activity of a country or region;
- patenting samples over time.

System analysis of these factors, according to the developers of these criteria, should show the degree of penetration of technologies into the production sector and indicate the scale of their use. And the analysis of indicators such as quoting previously issued patents will determine how much technology affects society and the economy.

This kind of approach cannot be used in the realities of developing countries. Thus, the procedure for obtaining a patent, as a special security document, requires the developer of the technology and special knowledge to obtain it, and

funds to pay for its issuance. Most developers prefer not to go through this procedure since they have neither the resources nor the time to do so. Due to these reasons, the criterion of the number and content of issued patents cannot reflect the real picture of the effectiveness of the technology.

In 1995, the Organization for Economic Co-operation and Development (OECD) formed indicators of the effectiveness of scientific and technical activities and the attraction of human resources [9]. Within this guideline, the use of a specialized category as “human resources in science and technology” (HRST) has been proposed. This category is intended to reflect the degree of penetration of highly educated personnel (scientists) into the field of production and implementation of technologies. According to the level of such penetration, it was proposed to determine many macroeconomic indicators of technological development, including performance indicators from the implementation of technologies.

Such indicators cannot be used to assess the effectiveness of technologies since they represent only a macroeconomic picture of the involvement of scientists in the production sector. Under the conditions of most economies of the world, including Ukraine, not all technologies go through the stage of testing at the level of scientific checks or research. The results of the study, established using the HRST method, are guaranteed not to reflect all the technologies that are actually embodied in the production sector. Because of this, this approach cannot be used to determine the effectiveness of technologies, for the purposes of their financing and budget support.

From 1992 to 2018, within the framework of joint activities of the Organization for Economic Co-operation and Development (OECD) and the Statistical Office of the European Community (SOEC), a number of recommendations for innovation (OSLO guidance) were developed. The third edition of these recommendations, published in 2018, contains a completely different approach to understanding the effectiveness of technology [10]. Thus, as criteria for which technology as a type of innovation must meet, novelty and technical suitability were attributed. Technology must be effective when it is new. This means that it must be unknown to a certain market until its creation or give a result that was not achievable before. It is impossible to talk about the effectiveness of technology when it is not implemented within any production process or does not have a plan (project) for such implementation.

The use of universal categories of generalized type within the framework of the process of evaluating the effectiveness of technologies makes it possible to ensure the possibility of their use in all areas where they are used. This kind of criteria is the result of a generalized analysis of not only production technologies but also technologies from other areas of the economy and society. Their versatility allows them to be applied to any process or phenomenon, including the process of financing and budget support of technologies. It is the approach of distinguishing universal criteria that is the approach that is potentially capable of producing the result necessary for participants in investment relations or budget support relations. Nevertheless, the criteria of novelty and technical suitability themselves are clearly not enough to predict all the risks of technology efficiency. Because of this, the content of universal criteria for determining the effectiveness of technology requires their further research.

The current Law of Ukraine “On State Regulation of Activities in the Field of Technology Transfer” does not operate with the concept of technology efficiency, leaving this

issue to independently determine by the parties to these relations [11]. At the same time, for the purposes of budget financing, this regulatory document provides for certain requirements for the content of the technology. Thus, when conducting a state examination of technologies, which is a prerequisite for making a decision on the use of support tools, the following should be taken into account:

- technological level and novelty of technologies, their components and equipment;
- approximate market price of technology and equipment or the amount of payment for their use;
- competitiveness of technologies and products that will be manufactured using these technologies;
- patent purity of technologies, their components;
- compliance of technologies with the norms of technogenic and environmental safety, technical regulation.

In other words, technologies that do not meet this kind of requirements will not be able to pass the state examination and receive budget funding and support. An analysis of the above requirements indicates that some of them are focused on integrity requirements and some on performance requirements. Thus, the technology that does not make it possible to ensure the release of competitive products or is not itself competitive is inefficient and cannot be implemented. The criterion of competitiveness of the results of technology can also be used for research purposes since it is endowed with signs of universality.

In general, we can state that within the framework of global cooperation there are no mechanisms for generalizing approaches to determining the effectiveness of technologies. This is due to the fact that countries highly value and protect the implemented technologies. The lack of universal approaches to identifying the essence of technologies does not allow their free circulation on the world market and makes it possible for them to be concentrated at the level of a separate country. And national approaches to determining performance criteria are guaranteed to be different. This leads to the lack of common approaches to understanding the effectiveness of technology.

5. 2. Generalization of circumstances that affect the formation of criteria for the effectiveness of technology

Based on the existing approaches and attempts to determine the criteria for the effectiveness of technology, it is advisable to form them at the level of universal criteria. At the same time, such criteria should correspond to the external and internal circumstances that affect them. Universal criteria will make it possible to more effectively distinguish suitable technology from pseudo and outdated technologies. And their generalization will allow them to be used for a wider range of public relations, including the issues of expediency of financing or budget support for their implementation.

It is expedient to form criteria by which the technology is effective:

- it makes it possible to get a result that was not achievable before;
- it makes it possible to get a significantly improved result with a higher level of competitiveness;
- it is locally new, unknown, or not available within the relevant market or territory;
- it meets the requirements of technogenic, environmental, and industrial safety.

Such a criterion as obtaining an unattainable result is the ability to obtain a new object of economic relations. Such

an object may be a new consumer product, new products for industrial and technical purposes or a work (service). At the same time, the new result does not mean not known to society or the economy. This indicates that it was not achievable earlier, due to the existing technical features of the prevailing production process. The expediency of using this element is that any new product, work, or service will always be in high demand. Until the appearance of such a previously unattainable result, consumers within a certain commodity market were not able to satisfy their consumer needs at the expense of other objects. Due to pent-up demand, this kind of goods, works, and services will be actively purchased and a larger percentage of future profits can be laid in them. In addition, new objects of market turnover are devoid of competition and will not feel pressure from similar product offers.

Requirements for a significantly improved result with a higher level of competitiveness are that the result of the implementation of technology is the emergence of already known products. Nevertheless, it is endowed with a level of production cost that was not achievable earlier with the level of development of technology and technology, which was recognized as predominant. This kind of advantage can be achieved by reducing raw material or resource costs. Or by increasing the level of cultivation of consumables, or a significant increase in the quality of the final product. It is these objects that will receive advantages within the framework of commodity competition in the market. Their implementation is guaranteed to become greater, and the profits from the use of their production technology – greater.

The formal criterion of local novelty indicates that this kind of technology does not apply to the dominant or already actively used within the economy of a particular country. Novelty within the concept of efficiency should be exclusively regional or local. The absence of global processes of systematization of information about technologies, in general, makes it impossible to determine the novelty of the absolute. In addition, the different state of development of each individual country significantly complicates this process. However, the new technology is more likely to produce an attractive economic result than those that are already actively used. It is because of it that it should be taken into account in the general complex of efficiency factors.

Environmental, man-made, and industrial compliance is that every technology must be safe. Any production process cannot harm the general public interest, be dangerous to others or other business entities. These requirements apply to all means of production without exception and technology, despite its uniqueness, in no way can avoid them. Because of this, these kinds of requirements are included in the content category of technology efficiency. In addition, their non-compliance will exclude the possibility of using such technology without regard to any results of its work. In other words, safety requirements must be taken into account beyond the will of the parties to technology transfer.

First of all, it is necessary to indicate that technology is involved in many areas and aspects of economic and social life. This necessitates consideration of efficiency requirements from these areas as well. Thus, technology is the object of innovative relations, and it is subject to the requirements of efficiency that are characteristic of innovation. The technology is characterized by signs of the object of intellectual property rights, respectively, it is necessary to take into account these requirements as well. The material embodiment of technology is a full-fledged object of eco-

conomic and civil turnover, which must be taken into account to assess its effectiveness as a separate unit of property.

The effectiveness of the technology is influenced by the territory and terrain within which it must be implemented. Very often, this kind of terrain and territory coincide with a particular state. Territorial characteristics depend on the degree of infrastructural development of a particular country, the rules of access to resources and raw materials, the existing (predominant) level of production development. In addition, the territorial component is determined by the presence or absence of rules for the circulation of technologies, prerequisites for protecting the rights and legitimate interests of participants in these relations.

It is because of this that the territory in which this kind of technology will be implemented in the future should be taken into account when deciding on its effectiveness. This kind of feature can be described as a sign of local (territorial) awareness.

The next circumstance affecting the efficiency of technology is the level of technological development (type of technological device). The technological structure (way of life) is a set of related industries that use common basic technologies and develop synchronously. The change in the type of technological structure (way of life, paradigms) is influenced by mass radical innovations and technological innovations [12]. Ukraine is at the level of 4–5 technological structure associated with inorganic chemistry, ferrous metallurgy, conveyor type of production, petrochemistry. At the same time, most developed economies have already moved to the 6th level of the technological structure based on nanoelectronics, molecular and nano photonics. It is because of this technological lag that any lagging technology of the 5th technological level imported to Ukraine will have revolutionary significance within its economy. In other words, if technology is recognized as obsolete within a developed economy, at the same time, it will be considered advanced within the developing economy. This property can be defined as the local ability to change the type of production relationship or technological structure. However, this kind of characteristic may manifest itself in the future, after the implementation of technology in the production sector and the penetration of its results into the relevant commodity markets. This result is highly desirable for those investors who invest in technology. Nevertheless, the probability of its occurrence will depend on a large number of variable factors of a macroeconomic nature. And this leads to difficulties in the possibility of identifying these properties at the level of investment financing or state support for its implementation.

Many aspects of the effectiveness of the technology will depend on its purpose. Thus, the main task of any technology is the production of consumer goods, industrial and technical products, or the execution of work (provision of services). The adaptability of technology to its intended purpose plays a key role in determining its effectiveness. Under no circumstances can a technology that cannot provide such a result be recognized as effective.

Suitability for embodiment within the production processes of economic activity should also be taken into account when determining the degree of efficiency of technology. More interesting for the investor and bodies authorized for budget financing and support is the technology that has the ability to be implemented within a specific production process. This kind of feature is called industrial suitability. However, it does not appear that the sign of industrial suitability, for financing

purposes, will not play a decisive role. Yes, it will influence the decision to allocate such funding. Nevertheless, industrial suitability without the presence of other characteristics reduces the essence of technology to equipment, machines, and mechanisms.

Do not forget about the requirements of technogenic, environmental, and industrial safety. Whatever the technology in terms of its performance, but it cannot be used to the detriment of staff, the environment, and others. Failure to meet these requirements makes it impossible to use the technology as a whole, and not just to raise the question of its effectiveness.

The results of the use of technology (products, goods, services, results of work) in their final result should come into the sphere of its social exchange. The economy of Ukraine, as well as the economy of most countries of the world, is classified as market-type economies. This means that the technology should give the result that can interest the potential buyer (purchaser) and become a product in the relevant product market. In other words, the result of the use of technology should have both general consumer properties and special ones. That is, it must have consumer and exchange value and compete with other similar goods in the relevant market. If the technology is not able to provide a competitive result, it is difficult to talk about any of its effectiveness.

The level of efficiency will be influenced by the level of consumption of raw materials, resources, and stocks during the use of technology. If the result of its operation is new, but the cost of achieving it exceeds the permissible consumption rates or significantly increases the cost of the production process, then the efficiency will be low.

In general, all the above circumstances that affect the definition of the concept of technology effectiveness can be classified according to the source of circumstances, as follows:

- external circumstances that affect the effectiveness of the technology;
- internal circumstances that affect the effectiveness of the technology.

External ones include the territory of implementation and the technological structure of the economy, the level of competition in the market where the results of the technology will be implemented. The internal ones include industrial suitability of technology, the ability to give production results, the level of consumption of resources and raw materials.

The generalization of the circumstances arising from determining the effectiveness of technologies makes it possible to form reasonable criteria for its effectiveness. Understanding the essence of economic and social processes, during the creation of regulatory mechanisms for regulating economic relations, is the key to their further effectiveness. The main disadvantage of the legal regulation of technology transfer in Ukraine is its detachment from business needs. The Ukrainian legislator, forming legal means of regulation, is very often guided by other circumstances of the introduction of one or another means of regulation. Sometimes it can be foreign experience or a subjective understanding of the essence of a certain phenomenon on the part of an official. The introduction of criteria for the effectiveness of technology, based on circumstances that affect its content and significance, will eliminate the subjectivism of legal regulation, and make it more effective. The above system of circumstances that affect the level of efficiency of technologies is the intellectual result that can be the basis for making a decision on the introduction of certain means of regulatory

regulation. Within the system of scientific research, no similar, or at least similar, results were found. Until this time, scientists did not propose to lay the basis for the normative influence of the state, those circumstances that determine the essence of a particular phenomenon, or process.

5.3. Research of means of regulatory regulation and fixation of criteria for the effectiveness of technology within the framework of legislative acts and contractual clauses

The proposed universal criteria for the effectiveness of technology can be fully used in the formation of regulatory mechanisms for regulating social relations. For example, they can be reflected in the provisions of the Law of Ukraine “On State Regulation of Activities in the Field of Technology Transfer”. In this legal act, they can be enshrined as requirements for the technology that claims to be budget funding or support. Similar prescriptions can be reflected within the legal system of any country, provided that such a country uses codified or systematized regulatory documents. At the practice level of applying the recommendations of international institutions, such as the OECD, these same constructions can be the basis of their decisions and methods. In general, the same constructions can become the basis for building full-fledged international agreements and conventions, if adopted.

Fixing the criteria for the ability to give a new or significantly improved result, as well as signs of local novelty, can also be used in the formation of contractual regulation of certain economic relations. Thus, any customer of a new technology seeks to obtain guarantees that his investments will give the expected result. He will seek to introduce appropriate protective clauses to the contract that will determine the general investment algorithm. The basis of this kind of reservations can also be laid the proposed criteria for the effectiveness of the technology. This will make it possible for the parties to clearly define the method and degree of fulfillment of previously accepted economic obligations.

It is a well-known fact that any state is interested in the mass distribution of advanced and high-tech technologies. For this, most of them are even willing to spend taxpayers' money. That is, to carry out budget financing of technological projects or scientific research on the development of new technologies. Ukraine is no exception to this rule. Thus, the Law of Ukraine “On the State Budget of Ukraine for 2021” [13] provides for a number of investment projects financed from the state budget. At the same time, no provision of the current legislation of Ukraine provides for the criteria by which a decision should be made to allocate such funding. Thus, it remains not clear what guided the legislator in approving the possibility of financing specific projects. The content of the said Law of Ukraine makes it possible to determine that funding is allocated when a particular local authority proves the need to invest in order to achieve some goals of the territorial community. In other words, the initiator of the provision of budget funding is one public authority, and this kind of proposal is considered by another authority. At the same time, officials of such bodies are not limited in their right to support a particular project. The practice of making such decisions shows that budget support is not always allocated to projects that are potentially capable of giving a specific result. This approach is not rational and cannot be used in the future. Its use is permissible when, as a result of the implementation of a state investment project, an infrastructure object or a certain kind of structure is created. Nevertheless, it cannot be used when it comes to the development and implementation of

new technologies. Absolute freedom of decision-making for a responsible official is not permissible here. Technology is a multidimensional and multifaceted phenomenon. Determining whether it can give a certain result or not is a very complex and lengthy process. In such circumstances, the official of the management body responsible for the distribution of state funding should have categories of effectiveness of the future technology with which it will be possible to compare the project submitted to provide such support. The proposed universal criteria for determining the effectiveness of the technology will be useful. Thus, they should be enshrined in the provisions of the current legislation of Ukraine, as those principles that under no circumstances can be ignored when deciding on the provision of budget financing. In other words, no official should be entitled to decide on budget funding for a project to implement a technology that does not meet these performance criteria. Subject to the introduction of these restrictions, to the provisions of the current legislation, any decision to provide budget support will be aimed at creating technologies that will potentially be able to either create a new or significantly improved product and are endowed with signs of local novelty. Under such conditions, the efficiency of using budget funds will increase significantly.

But it must be remembered that all of the listed elements of technology efficiency are designed for use under the conditions of the full functioning of a market-type economy. If the economic system of a particular country finds itself in a state of economic failure (fiasco), then these criteria lose their effectiveness. Self-regulatory mechanisms of the Ukrainian economy are not able to fully meet all the existing needs of society. Especially within defense needs and energy supply. The reason for this is the open armed aggression of the neighboring state and the imposed restrictions due to martial law. Now Ukraine needs not technologies aimed at producing highly competitive goods or services but technologies for an effective fast production cycle. The experience of our state makes it possible to determine that under conditions when the economy is not full-fledged, approaches to the production process also change. In the first place, according to needs, are those technologies that make it possible to achieve mass production of goods and services and can be quickly deployed. And questions of the level of novelty and reach of new consumer properties of goods fade into the background. Given this, it is possible to form a special set of criteria that should be used to assess the effectiveness of the technology to be used in a special period. Whether it will be an economy operating under martial law, environmental disaster, natural disaster. They can be formulated as follows:

- the ability to get a mass result with a high level of resource savings;
- high level of industrial suitability, which makes it possible to achieve quick adjustment and launch;
- suitability for the production of essential goods and goods that meet the critical needs of the population.

6. Discussion of results of investigating the criteria for the effectiveness of technology for its further financing and budget support

The proposed universal criteria for the effectiveness of the technology will make it possible to obtain convenient tools for quick and effective settlement of social relations within the framework of technology transfer. They are equally suitable

both for use within the framework of legal technology for the formation of regulatory legal acts and contractual regulation. Their essence reflects most of the approaches to understanding the essence and manifestations of technology in all spheres of economic and social life. Without any reservations, they can be the basis of both state regulatory influence and individual forms of contractual cooperation. Under any conditions and applications, they will equally reflect the criteria for separating effective technology from their outdated or pseudo analogues.

The research is aimed at forming a conceptual approach to understanding the criteria for the effectiveness of technologies. It is possible that in certain areas or activities, the proposed concept of performance criteria will require some refinement. However, in any case, all previous scientific studies [1–7] either studied macroeconomic indicators of the degree of technological equipment, or the level of their scientific support. None of the scientists who investigated this issue proposed to form universal performance criteria. Most of the improvements are aimed at specialized, industry applications and evaluate exclusively narrowly focused technological processes. The results of this scientific study contain conclusions that can become the basis for the formation of acts of promising legislation of national and international legislation, which is their advantage over similar studies. In addition, recommendations within the framework of this work can be used in the practice of public administration and contractual work, which no one has previously paid any attention to.

The main disadvantage of the study is the lack of objectively systematized information about the results of the implementation of technologies within the private sector of the economy. And information on standard essential conditions for contractual and investment cooperation and analytical information on the practice of implementing budget support projects for the introduction of new technologies. Business entities are drawn to the concealment of this information, due to the component of a trade secret. And public authorities are inclined to an individual approach when deciding on the application of budget support measures. The lack of such information makes it impossible to form proposals for determining performance criteria, with a higher coefficient of effectiveness.

When conducting this study, not all socio-economic technologies were taken into account in its subject. Only production technologies that can be the basis of the production process were taken into account. Technologies for the implementation of social, psychological, pedagogical, political, and other processes were not taken into account.

Further development of this study will make it possible to obtain the results of a practical orientation. On its basis, draft laws of Ukraine, draft acts of national legislation of other countries, draft international documents can be formed. The results of this study can become the basis for the formation of specialized (industry) criteria for the effectiveness of technologies.

7. Conclusions

1. The study of the criteria for the effectiveness of technology has established that the approach to their understanding is not unified and unanimous. Within each sector or direction of social or economic life, the effectiveness of technology is understood differently. This negatively affects the process of financing technologies through investment funds or budget support funds.

2. During the study of the circumstances that affect the degree of effectiveness of the technology, a number of factors of dependence of external and internal nature were identified. It is proved that the effectiveness of technology depends on the territory of implementation and the level of technological development of the economy, its suitability for implementation in the production process. The dependence of the effectiveness of technology on the level of competition in the market, the degree of consumption of raw materials and safety for the environment has been formed. (need stylistic adjustment).

3. Proposals were formed on regulatory means and recommendations for fixing universal criteria for identifying the effectiveness of technology, which can be used to determine the possibility of their financing. It is justified that these include:

- the possibility of obtaining a result that was not achievable before;
- the ability to get a significantly improved result with a higher level of competitiveness;
- the level of local novelty, due to the fact that the technology was unknown or not available within the relevant market or territory;
- compliance with the requirements of technogenic, environmental and industrial safety.

Proposals have been formed to determine the effectiveness of the technology, which should be implemented within the economy operating under conditions of martial law, man-made disasters, natural disasters. It is proposed to attribute to them the following:

- the ability to get a mass result with a high level of resource savings;
- high level of industrial suitability which makes it possible to achieve quick adjustment and launch;
- suitability for the production of essential goods and goods that meet the critical needs of the population.

It is proved that these changes will create the necessary prerequisites for the financial support of the processes of creation, transfer of rights and implementation of technologies at the expense of the non-banking financial market.

It is proved that it is the universal constructions for determining the degree of efficiency of technology that can be used to improve the content of the Law of Ukraine “On State Regulation of Activities in the Field of Technology Transfer”. Or become the basis for the formation of regulatory prescriptions of national legal systems or the basis for international agreements and economic treaties.

Conflicts of interest

The authors declare that they have no conflict of interest in relation to this research, whether financial, personal, authorship or otherwise, that could affect the research and its results presented in this paper.

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Data availability

All data are available in the main text of the manuscript.

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