



Socio-Economic Effects from the Implementation of Mechanisms for Increasing the Competitiveness of Mechanical Engineering

Svitlana Koshova ^{1*} • Rostyslav Palahusynets ²

¹ National Academy of Internal Affairs (Ukraine). Associate Professor at the Department of Administrative and Legal Disciplines, PhD in Public Administration, Associate Professor.

² Ministry of Foreign Affairs of Ukraine (Ukraine). Deputy Permanent Representative of Ukraine to the International Organizations in Vienna, Doctor of Science in Public Administration, Candidate of Economic Sciences, Associate Professor.

* Corresponding Author, e-mail: svet.lana.koshova@gmail.com

ARTICLE INFO

ABSTRACT

Research Article

DOI:

[10.70651/3041-248X/2025.11.08](https://doi.org/10.70651/3041-248X/2025.11.08)

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The article considers the socio-economic effects of the implementation of mechanisms for increasing the competitiveness of mechanical engineering in the context of transformational changes in the economy of Ukraine. It is established that the development of the machine-building industry is determined by a combination of state strategic priorities and internal factors of the functioning of enterprises. It is found that strategic documents, in particular the National Economic Strategy until 2030, determine important areas of modernization and form an institutional basis for the implementation of the competitiveness policy. It was emphasized that an important task is to expand the financial capabilities of the industry, reduce overregulation and create favorable conditions for innovative activity. It is determined that strategic imperatives should be based on a systematic approach that combines the modernization of capacities, the diversification of the production structure and the provision of technological sovereignty. It is noted that the development of public-private partnerships is a tool for mobilizing investment resources for high-tech projects. The importance of the innovation activity of enterprises as an important indicator of the effectiveness of the implemented mechanisms is revealed. It is emphasized that the shortage of skilled labor and the intensification of labor migration limit the opportunities for technological renewal of production. It is determined that the dynamics of the introduction of innovative products is characterized by significant fluctuations, which indicates the presence of system barriers. The relationship between innovation activity and labor productivity in industry and mechanical engineering is considered. It is emphasized that the legal environment requires effective tax, customs and institutional solutions. It was stated that investment mechanisms should be directed to the modernization and renewal of production capacities. The importance of integration of the state, business and educational and scientific environment to ensure synergy in the development of mechanical engineering is revealed.

KEYWORDS

mechanical engineering, competitiveness, innovation activity, labor productivity, modernization, mechanisms.



Соціально-економічні ефекти від реалізації механізмів підвищення конкурентоспроможності машинобудування

Світлана П. Кошова  ^{1*} • Ростислав В. Палагусинець  ²

¹ Національна академія внутрішніх справ (Україна). Доцент кафедри адміністративно-правових дисциплін, канд. держ. упр., доцент.

² Міністерство закордонних справ України (Україна). Заступник постійного представника України при міжнародних організаціях у Відні, д-р держ. упр., канд. екон. наук, доцент.

* Автор-кореспондент, e-mail: svet.lana.koshova@gmail.com

СТАТТЯ

АНОТАЦІЯ

Дослідницька

DOI:

[10.70651/3041-248X/2025.11.08](https://doi.org/10.70651/3041-248X/2025.11.08)

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У статті розглянуто соціально-економічні ефекти від реалізації механізмів підвищення конкурентоспроможності машинобудування в умовах трансформаційних змін економіки України. Встановлено, що розвиток машинобудівної галузі зумовлюється поєднанням державних стратегічних пріоритетів і внутрішніх чинників функціонування підприємств. З'ясовано, що стратегічні документи, зокрема Національна економічна стратегія до 2030 року, визначають важливі напрями модернізації та формують інституційну основу для реалізації політики конкурентоспроможності. Наголошено, що важливим завданням виступає розширення фінансових можливостей галузі, зниження зарегульованості та створення сприятливих умов для інноваційної діяльності. Визначено, що стратегічні імперативи повинні ґрунтуватися на системному підході, який поєднує модернізацію потужностей, диверсифікацію виробничої структури та забезпечення технологічного суверенітету. Зауважено, що розвиток державно-приватного партнерства є інструментом мобілізації інвестиційних ресурсів для високотехнологічних проєктів. Розкрито значення інноваційної активності підприємств як важливого індикатора ефективності впроваджуваних механізмів. Підкреслено, що дефіцит кваліфікованої робочої сили та активізація трудової міграції обмежують можливості для технологічного оновлення виробництва. Визначено, що динаміка впровадження інноваційної продукції характеризується значними коливаннями, що свідчить про наявність системних бар'єрів. Розглянуто взаємозв'язок між інноваційною активністю та продуктивністю праці у промисловості й машинобудуванні. Підкреслено, що правове середовище потребує дієвих податкових, митних та інституційних рішень. Констатовано, що інвестиційні механізми мають спрямовуватися на модернізацію та оновлення виробничих потужностей. Розкрито значення інтеграції держави, бізнесу та освітньо-наукового середовища для забезпечення синергії у розвитку машинобудування.

КЛЮЧОВІ СЛОВА

машинобудування, конкурентоспроможність, інноваційна активність, продуктивність праці, модернізація, механізми.

1. Introduction

The article is aimed at identifying and substantiating the socio-economic effects of the implementation of mechanisms for increasing the competitiveness of mechanical engineering in the context of transformational changes in the economy of Ukraine.

The study uses a set of methods that provide a systematic analysis of the socio-economic effects of the implementation of mechanisms for increasing the competitiveness of mechanical engineering in Ukraine. The materials of the study were: strategic documents of Ukraine: National Economic Strategy until 2030, Industrial Development Strategy, state programs to support innovation activity; statistical data of the State Statistics Service of Ukraine for 2015–2024 on innovation activity of enterprises, investment volumes, labor productivity and output of innovative products; analytical reports of international organizations (OECD, UNIDO, World Bank) on industrial competitiveness; reporting and open data of enterprises in the machine-building industry; the results of research by domestic and foreign scientists in the field of industrial policy, innovative development and increasing the competitiveness of industry.

2. Literature Review

The analysis of recent studies and publications shows that the scientific community pays considerable attention to the problems of transformation and increasing the competitiveness of the machine-building complex of Ukraine. In particular, O. Pinchuk substantiates the impact of hostilities on transformational changes in mechanical engineering and focuses on the need to adapt the industry to new operating conditions [1]. I. Kosmidailo and V. Markov investigate structural transformations and strategic imperatives of the development of a machine-building complex, which creates the basis for the formation of long-term guidelines [2]. Instead, I. Epifanova et al. offer specific directions for improving the level of competitiveness of enterprises, emphasizing the importance of innovative solutions and organizational changes [3]. M. Samofalova focuses on forecasting the level of competitiveness of machine-building enterprises and determines the possibilities of assessing future trends in their development [4]. In addition, O. Fedorchak analyzes the improvement of public management of financial activities of machine-building enterprises, which opens up prospects for strengthening the socio-economic effects of the functioning of the industry in modern conditions [5].

3. Problem Statement

Modern transformation processes in the economy of Ukraine are accompanied by increased competition in domestic and foreign markets, which directly determines the need to strengthen the position of Ukrainian mechanical engineering as a strategically important industry. Taking into account the dynamic changes in the world market environment and the growing requirements for innovation and efficiency of production, it is the machine-building complex that can become an important driver of structural modernization of the national economy. of this industry to ensure industrial development, maintain economic security and expand export opportunities determines its central place in the system of long-term economic priorities of the state. Therefore, the task of a comprehensive scientific analysis of the conditions and mechanisms for increasing the competitiveness of mechanical engineering, the results of which will make it possible to form effective guidelines for state policy and corporate strategies, is urgent.

4. Methods and Materials

Research methods:

1. System-structural method. It was used to determine the relationship between the mechanisms of state regulation, internal factors of enterprise activity and their impact on the competitiveness of mechanical engineering. It made it possible to generalize the institutional prerequisites and identify the key systemic barriers to the development of the industry.

2. Comparative and analytical method. It was used to compare the dynamics of development of the machine-building industry of Ukraine with trends in industrialized countries. This ensured the

identification of common patterns and differences in the implementation of investment and innovation mechanisms.

3. Economic and statistical methods. Statistical indicators of innovation activity, labor productivity, capital investments, and export of machine-building products have been worked out. Methods of dynamic series, index analysis, and assessment of variational fluctuations of indicators have been used, which made it possible to trace trends and identify structural problems.

4. Method of economic modeling and evaluation of effects. It is used to determine the impact of innovation, investment and regulatory mechanisms on the socio-economic results of the industry. The correlations between the level of innovation activity, labor productivity and the volume of output of innovative products are assessed.

5. Institutional analysis. It is aimed at assessing the role of the state, business, educational and scientific spheres and public-private partnership in creating conditions for the modernization of mechanical engineering. The method made it possible to study the influence of the legal environment, tax and customs incentives on the investment attractiveness of the industry.

6. Expert and analytical method. The conclusions of industry experts, reports of think tanks, and recommendations of industry associations are involved in clarifying the factors that hinder competitiveness and assessing the potential of modernization tools.

5. Results and Discussion

The development of the machine-building industry is determined by a combination of state strategic priorities and internal factors of the functioning of enterprises. In this context, it is important to consider program documents that outline long-term directions of modernization and increase of the competitiveness of production. They form the basis for further analysis of the socio-economic effects of the implementation of mechanisms for increasing competitiveness.

Thus, it should be noted that the ways to achieve the strategic goal "Creation of new production capacities through stimulation of innovative activities of enterprises in all regions of the country using the competitive advantages of each of them" of the National Economic Strategy for the period up to 2030 [6] determine the development of Ukrainian mechanical engineering, in particular transport and railway, production of agricultural machinery and shipbuilding. In addition, to achieve this goal, it is envisaged to implement such tasks as expanding the financial capabilities of sectors and their ability to attract investors, adapting tariff policies and practices in accordance with the needs of the industry, reducing overregulation, as well as supporting innovation and the dissemination of effective production practices. An important place is occupied by the introduction of incentive and compensation mechanisms at various levels of management for priority export-oriented subsectors of mechanical engineering. In this context, the emphasis is also placed on state support for the shipbuilding industry, as well as on the involvement of young people in educational programs, which contributes to the formation of highly qualified human resources.

In turn, the strategic imperatives for the development of mechanical engineering should be formed based on a systematic and synergistic approach focused on the modernization of production capacities, the introduction of innovative technologies, the diversification of the production structure and the strengthening of export potential. Ensuring technological sovereignty through the creation of closed production cycles, localization of critical industries and the development of import-substituting technological chains should also be an important direction [2, p. 103].

Within the framework of a systematic approach, it is also advisable to introduce public-private partnership mechanisms that can attract investment resources for high-tech projects and promote their implementation in regions with existing production and human resources. In view of this, the formation of new institutional platforms for coordinating the interaction of the state, business and the educational and scientific environment is of particular importance. Also, an important indicator of the effectiveness of such mechanisms is the innovative activity of enterprises, which reflects their ability to update production processes and develop new markets (Table 1).

The analysis of the dynamics of the introduction of innovations in the industry of Ukraine indicates the instability of this process in 2020-2024. In general, the number of enterprises that carried out innovative activities in the industry tended to decrease in 2021-2023, but in 2024, there is a significant increase (from 293 to 586 enterprises). This reflects the cyclical nature of innovation processes and the dependence of their intensity on the economic and political situation in the country.

Table 1. Number of enterprises that implemented innovations (products and/or innovation processes), units

Type of economic activity of the industry	2020	2021	2022	2023	2024
Industry	718	292	319	293	586
Processing industry	668	259	290	266	515
Mechanical engineering	185	89	86	81	147
In particular:					
Production of computers, electronic and optical products	34	17	18	19	8
Production of electrical equipment	38	22	21	15	33
Production of machinery and equipment not classified in other groups	67	29	22	22	41
Production of motor vehicles, trailers and semi-trailers	21	4	9	9	13
Production of other vehicles	25	17	16	16	52

Source: Compiled based on [7].

The processing industry, which is an important segment of industrial production, showed similar trends. After a decrease in the number of innovatively active enterprises in 2021–2023. The indicator increased significantly in 2024, which indicates the intensification of state and regional incentive measures. This creates the basis for the formation of prerequisites for the growth of the competitiveness of the industry.

Of particular interest are the indicators of mechanical engineering, which is a strategic branch of the economy. In 2020, 185 enterprises introduced innovations, but already in 2021–2023. Their number has almost halved, reaching a minimum value in 2023 (81 enterprises). In 2024, a certain revival of innovation activity was recorded (147 enterprises), but the indicators remain lower than in 2020.

A detailed analysis of individual sub-branches of mechanical engineering allows you to identify the unevenness of innovative processes. Thus, in the production of computers, electronic and optical products, the indicator decreased from 34 enterprises in 2020 to 8 in 2024, which demonstrates deep stagnation. In the segment of the production of electrical equipment, the situation looks more stable, because after a decline in 2021–2023. In 2024, up to 33 enterprises were restored. Similar dynamics are observed in the production of machinery and equipment not attributed to other groups: 67 enterprises in 2020, 22 enterprises in 2023, and already 41 enterprises in 2024. The production of motor vehicles, trailers and semi-trailers in 2021 experienced the largest reduction (to 4 enterprises), but gradually the indicators began to grow, reaching 13 in 2024. The most positive dynamics were demonstrated by the production of other vehicles, where in 2024 the number of innovatively active enterprises more than doubled compared to previous years (from 16 to 52). This indicates the significant potential of this sub-industry and its ability to become a driver of technological development.

A significant barrier to increasing the competitiveness of enterprises in the machine-building industry is the shortage of qualified labor. The educational system does not provide an adequate level of professional training, since a significant part of graduates do not have the practical skills necessary to meet the real needs of the production sector. This situation leads to an imbalance between the demand of enterprises for competent specialists and the supply of educational institutions [4, p. 9].

Along with this, there is a shortage of personnel in the areas of marketing, financial planning, budgeting, and organization of interaction with customers. The lack of specialists capable of carrying out managerial activities on the basis of customer-oriented approaches complicates the processes of organizing production and business processes at machine-building enterprises. This limits the possibilities of forming effective management strategies and reduces the level of flexibility in decision-making.

An additional factor that deepens the personnel problem is the intensification of labor migration. Qualified technical specialists who have the necessary experience and knowledge travel abroad or move to related fields of activity, which are seen as more attractive in terms of wages and working conditions. As a result, machine-building enterprises lose important human resources necessary for modernization and technological renewal of production.

At the same time, the reduction of human resources directly affects the level of innovation activity of enterprises, since the possibility of developing and introducing new goods and services is limited. To confirm this relationship, it is advisable to analyze the indicators on the number of innovative products introduced by enterprises in the period under study (Table 2).

Table 2. Number of innovative products (goods, services) introduced, units

Type of economic activity of industry	Number of innovative products (goods, services) introduced														
	Total					including									
						new to the market					new only for the enterprise				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
Industry	4066	1756	2347	2715	3382	691	375	405	437	401	3375	1381	1942	2278	2981
Processing industry	4006	1625	2299	c/c*	3340	680	374	392	430	397	3326	1251	1907	2213	2943
Mechanical engineering	1228	778	699	c/c	786	c/c	c/c	c/c	c/c	c/c	903	c/c	c/c	c/c	c/c
In particular:															
Production of computers, electronic and optical products	100	71	205	c/c	14	35	52	106	173	c/c	65	c/c	99	c/c	c/c
Production of electrical equipment	220	120	42	c/c	142	62	c/c	c/c	c/c	c/c	158	c/c	c/c	c/c	c/c
production of machinery and equipment not classified in other groups	540	428	219	c/c	166	106	c/c	72	c/c	22	434	373	147	c/c	144
Production of motor vehicles, trailers and semi-trailers	245	13	181	c/c	162	c/c	c/c	c/c	c/c	c/c	155	11	c/c	c/c	c/c
Production of other vehicles	123	146	52	136	302	32	c/c	10	c/c	38	91	c/c	42	c/c	264

* Critical condition.

Source: Compiled based on [7].

Analysis of the dynamics of the introduction of innovative products in the industry of Ukraine in 2020–2024 indicates significant fluctuations in indicators. The total number of new goods and services that appeared on the market more than halved in 2021 (from 4066 to 1756 units), but in the following years, there is a gradual increase to 3382 in 2024.

The processing industry reproduces the general dynamics, because it is within it that the main array of innovative products is formed. Decrease in indicators in 2021–2022 was due to economic instability and at the same time, a decrease in the investment attractiveness of enterprises. Instead, in 2024, there is a significant recovery (3340 units), which indicates the potential for rapid adaptation of this segment to new economic conditions.

In mechanical engineering, the situation has its own characteristics. In 2020, the number of innovative products introduced was 1228 units, but in 2021 it decreased to 778, and in 2022, to 699. Part of the data for the following years is marked as confidential, but the available indicators allow us to conclude that the tendency to reduce the volume of innovative products remains. This indicates the presence of systemic barriers that slow down the technological renewal of the industry.

Detailed data by subsectors of mechanical engineering demonstrate significant differentiation. The production of computers, electronic and optical products in 2020 had 100 innovative products, but in 2022 this figure doubled (205 units), after which a reduction can be traced. This may indicate situational activation due to the demand for technological solutions, which was not sustainable. On the contrary, there is a decline in the production of electrical equipment: from 220 units in 2020 to 42 in 2022. The production of machinery and equipment not classified as other groups also shows a decrease, from 540 units in 2020 to 219 in 2022, which confirms the loss of the industry's positions in the

domestic and foreign markets. The most contrasting is the example of the production of motor vehicles. If in 2020 it was characterized by a high level of innovation activity (245 units), then in 2021, only 13 new products were recorded. Further growth in 2022 to 181 units indicates the instability of development and dependence on external and internal factors, in particular, the level of demand and import substitution conditions. The production of other vehicles is characterized by relatively stable dynamics, with a gradual increase to 302 innovative products in 2024, which indicates that the sub-sector has sufficient potential for development, confirming the need to strengthen state support in the direction of stimulating demand and promotion to foreign markets. The production of other vehicles is characterized by relatively stable dynamics, with a gradual increase to 302 innovative products in 2024, which indicates that the sub-sector has sufficient potential for development, confirming the need to strengthen state support in the direction of stimulating demand and promotion to foreign markets.

At the same time, the quantitative characteristics of innovation activity do not give a complete picture of the effectiveness of the implemented measures, since an important criterion of effectiveness is the growth of both the number of innovations and their impact on the economic performance of enterprises. That is why it is advisable to analyze the dynamics of labor productivity, which reflects the degree of efficiency of the use of labor resources in industry and in mechanical engineering in particular. Comparison of these indicators during 2020–2023. allows you to identify the correlation between innovation activity and economic results, as well as to outline structural differences between individual sub-sectors of mechanical engineering (Fig. 1).

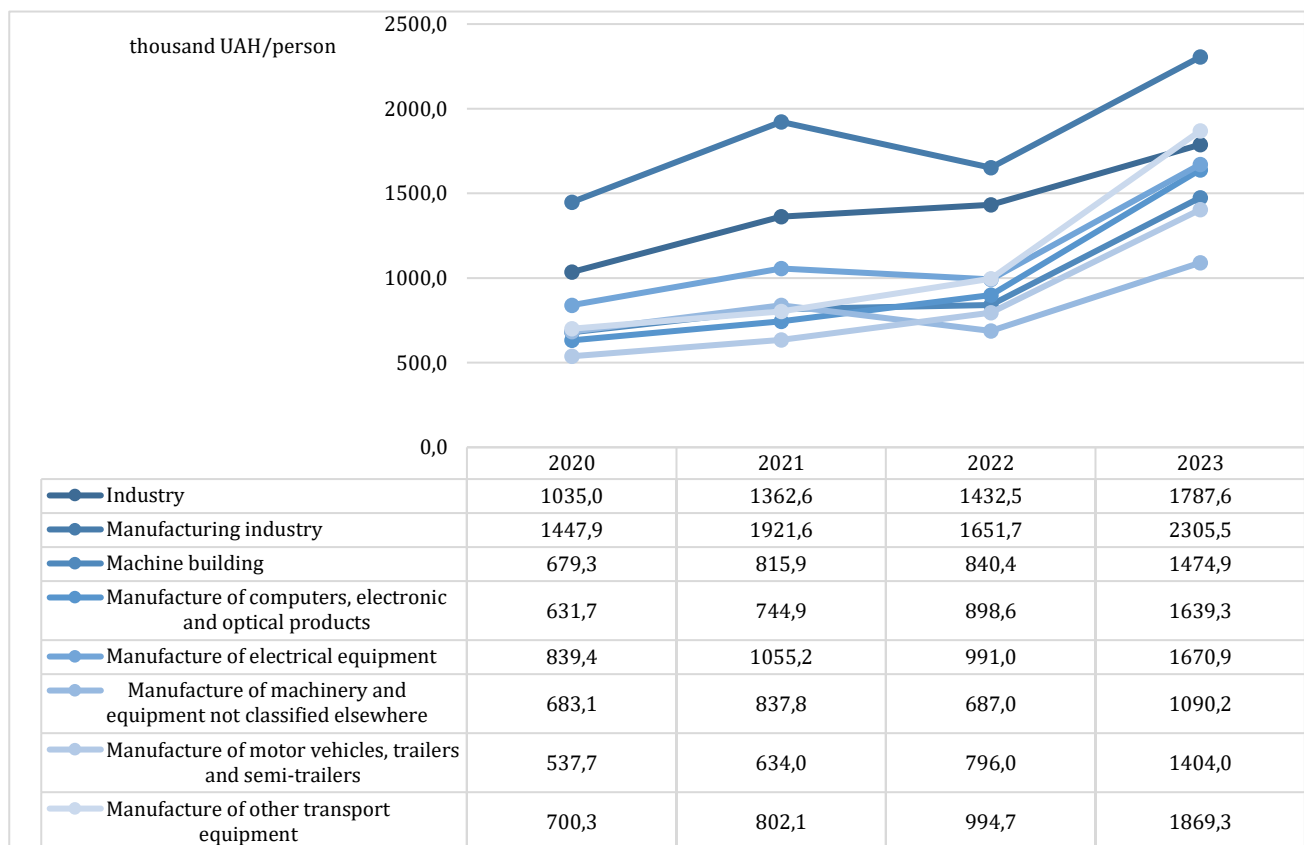


Figure 1. Labor productivity in industry and mechanical engineering and its varieties, in particular, thousands UAH / person.

Source: Calculated as the ratio of the volume of manufactured products (goods, services) to the number of employees according to the data [8].

The analysis of the submitted data shows that during 2020–2023. There is a steady increase in labor productivity in industry in general, as well as in the processing industry and mechanical engineering. In particular, labor productivity in industry increased from 1035.0 thousand UAH/person in 2020 to 1787.6 thousand UAH/person in 2023, which confirms the gradual strengthening of resource efficiency in the manufacturing sector. The processing industry showed even more pronounced dynamics, rising from 1447.9 thousand UAH/person in 2020 to 2305.5 thousand UAH/person in 2023, despite a certain decrease in 2022, which is explained by the impact of the full-scale invasion.

Mechanical engineering in general is characterized by lower values of labor productivity compared to the industry and the processing industry, but in 2023, there was a sharp increase in this indicator, from 840.4 thousand UAH/person in 2022 to 1474.9 thousand UAH/person. Such dynamics indicate an increase in the intensity of the introduction of innovative mechanisms and a more efficient use of labor potential, which creates prerequisites for the consolidation of long-term positive trends. A detailed analysis of individual sub-sectors of mechanical engineering reveals significant differences in the growth rate of labor productivity. The production of computers, electronic and optical products is characterized by the highest rates of efficiency improvement, from 631.7 thousand UAH/person in 2020 to 1639.3 thousand UAH/person in 2023, which indicates an active renewal of the technological base. Similar trends are observed in the production of electrical equipment, where the indicator has almost doubled, which emphasizes the role of innovation in ensuring competitiveness. At the same time, the production of machinery and equipment not classified as other groups showed more unstable dynamics: after growth in 2021, productivity decreased in 2022, and in 2023 it recovered to the level of 1090.2 thousand UAH/person. Such fluctuations indicate the sensitivity of this subsector to external challenges and internal constraints, which require a comprehensive state policy to stabilize its development. Especially indicative is the rapid growth in productivity in the production of motor vehicles, trailers and semi-trailers, where in 2020–2023. The figure more than doubled, reaching 1404.0 thousand UAH. UAH/person. This reflects the effect of modernizing production processes and intensifying innovative solutions. An even more pronounced positive dynamics was recorded in the production of other vehicles: from 700.3 thousand UAH/person in 2020 to 1869.3 thousand UAH/person. In 2023, this result indicates a successful combination of innovation activity with the effective use of human resources, which significantly increases the competitive position of this subsector.

It should be noted that the effective functioning and sustainable growth of domestic machine-building enterprises is possible only if an integral institutional environment is formed that combines legal, investment and innovation factors [4, p. 93]. Therefore, the legal environment should be based on the adoption of effective tax, customs, credit and institutional regulations that will provide favorable conditions for the activities of producers. The investment component provides for the development and implementation of mechanisms aimed at attracting additional financial resources necessary for the modernization of production facilities and technological renewal. At the same time, the innovation environment requires the introduction of organizational, production and financial innovations that can activate the internal reserves of enterprises and increase their competitiveness in global markets.

In this context, it is advisable to emphasize that the interaction of these components is systemic. The insufficiency of any of the elements – regulatory and legislative support, investment flows, or innovative development – significantly limits the opportunities to achieve high socio-economic effects. That is why it is important to coordinate the functioning of state institutions, business environment and research institutions in the direction of forming a balanced policy to support the machine-building industry.

Given the modern challenges of globalization and digitalization, the creation of conditions for the accelerated commercialization of innovations in mechanical engineering is of particular relevance. This provides for increasing financial accessibility for enterprises, as well as the development of innovative infrastructure - technology parks, incubators and cluster associations that contribute to the integration of science, production and business. This makes it possible to form long-term competitive advantages of Ukrainian mechanical engineering, while strengthening its contribution to the socio-economic development of the country.

In this context, an important indicator of the effectiveness of the implementation of innovative mechanisms is the volume of innovative products sold, which reflects the level of technological modernization of enterprises, as well as their ability to commercialize developments in the domestic and foreign markets. The analysis of these indicators allows us to trace the dynamics of economic return from the implemented innovations and assess their impact on the growth of the competitiveness of the industry (Table 3).

Analysis of the dynamics of the volume of innovative products sold in the industry of Ukraine in 2020–2024 indicates significant fluctuations caused by internal economic transformations and, at the same time, external factors. The overall indicator for industry decreased in 2021–2023, but in 2024, there was a sharp increase to UAH 136.9 billion, which is almost seven times higher than the previous year. Such dynamics demonstrate a high dependence of innovation activity on financial and economic

conditions and state support, and also indicate the possibility of intensifying innovation activity under the condition of the formation of a favorable environment.

Table 3. The volume of innovative products (goods, services) sold by enterprises, thousand UAH

Type of economic activity of the industry	2020	2021	2022	2023	2024
Industry	47526197,0	36838397,4	31678549,2	19381815,0	136879495,8
Processing industry	41538460,0	22651040,0	21902827,4	19206936,0	122422200,2
Mechanical engineering	10218558	5893798,0	6147156,5	4471458,0	40372392,9
In particular:					
Production of computers, electronic and optical products	1293497,0	229178,0	892480,1	777999,0	3177861,8
Production of electrical equipment	2442555,0	1067131,0	611341,4	595325,0	1546421,5
Production of machinery and equipment not classified in other groups	3571537,0	2719665,0	1662744,3	518867,0	2717008,8
Production of motor vehicles, trailers and semi-trailers	957927,0	111802,0	156769,7	143861,0	2530598,8
Production of other vehicles	1953042,0	1766022,0	2823821,0	2435406,0	30400502,0

Source: Compiled based on [7].

The processing industry, as an important segment of industrial production, generally repeats this trend. After a decrease in the volume of innovative products sold in 2021–2023, the figure in 2024 reached 122422200.2 thousand UAH. This confirms that the innovative development of processing enterprises can become a driver of structural modernization of the entire economy. At the same time, there is an increase in the role of individual industries in the formation of the overall result, which indicates the uneven spread of innovation processes.

Special attention should be paid to the machine-building industry, where the volume of innovative products sold increased from 4471458.0 thousand UAH in 2023 to 40372392.9 thousand UAH. In 2024, such a jump indicates the intensification of the production of high-tech products and the growth of their market attractiveness. At the same time, sharp fluctuations in previous years indicate the instability of development, which necessitates long-term mechanisms to support innovation activity.

The distribution of results by subsectors of mechanical engineering demonstrates differences in the scale of innovation activity. Thus, the production of computers, electronic and optical products in 2024 more than tripled the sales of innovative products compared to 2023, which confirms the significant potential of this area. The production of electrical equipment is characterized by less pronounced dynamics, but maintains an upward trend, which indicates the stability of the segment. The production of machinery and equipment not attributed to other groups shows downward trends in 2020–2023, but in 2024, there is a certain recovery. This suggests that this particular sub-sector needs additional institutional and financial incentives to build innovation capacity. The production of motor vehicles and trailers, despite relatively low indicators in previous years, recorded an increase of almost 18 times in 2024, which indicates the possibility of a quick response of the industry to market demand, subject to proper support. The most noticeable growth is demonstrated by the production of other vehicles: in 2024, the volume of innovative products sold exceeded 30400502.0 thousand UAH, which is more than 75% of the total result of the machine-building industry. This indicates the concentration of innovation activity in this area, which can have long-term socio-economic effects – from creating new jobs to strengthening export potential.

Thus, the analysis of indicators confirms the significant role of mechanical engineering in the formation of competitive advantages of the national economy. The identified structural shifts indicate that the effective implementation of the proposed mechanisms can ensure the sustainable development of the industry and its integration into global production and technological chains.

In the conditions of a difficult economic and political situation in Ukraine, increasing the efficiency and competitiveness of enterprises of the machine-building complex requires coordination of actions and the formation of a common vision of strategies for their development at the state and local levels. Taking into account the priority importance of mechanical engineering in strengthening the defense capability of the state, the production of innovative samples of military equipment, meeting the needs of enterprises in the real sector of the economy and the population, it is urgent to improve the areas of

budgetary, tax, customs, investment policy, as well as state policy in the field of science and digital transformation. This creates opportunities for a more accurate assessment of the needs for budget resources, tax and customs preferences for enterprises of the machine-building complex depending on their size, degree of innovative renewal and level of export orientation [5, p. 192].

In this context, the formation of a system of tools capable of ensuring a balance between state regulation and market mechanisms for the development of the industry is decisive. This allows to reduce the risks of excessive dependence of enterprises on external factors, in particular fluctuations in world markets, and at the same time creates conditions for the active introduction of innovative technologies and digital solutions in production processes.

It is predicted that the machine-building sector of Ukraine has the potential to become a significant element of the national economy, capable of providing stable growth and a tangible contribution to the formation of the country's gross domestic product. The realization of this potential is possible under the condition of a combination of effective state support, targeted attraction of investments, modernization of production facilities and gradual integration into global markets. Of particular importance is the development of research and implementation of the results of innovative activity, which creates the basis for strengthening Ukraine's competitive position at the world level [1, p. 44].

A new aspect of consideration is also the justification of the need to create cluster associations in the machine-building industry, which will contribute to more effective cooperation between industry, science and investment structures. Clustering will attract financial resources, accelerate technology transfer, increase labor productivity and provide a synergistic effect in the development of innovative industries.

At the same time, the coordination of state strategies with the needs of the industry, the formation of a favorable investment climate, the stabilization of the political and economic environment, as well as further integration into European economic and political structures, will become important prerequisites for the entry of the machine-building sector of Ukraine to a qualitatively new level. Under the implementation of the proposed mechanisms, enterprises in the industry will be able to achieve an increase in productivity, expansion of export opportunities and strengthening of positions in the European and world industrial space.

6. Conclusions

The analysis of the results shows that increasing the competitiveness of the machine-building industry of Ukraine is possible under the condition of a combination of state strategic guidelines and internal potentials of enterprises. In this context, the dynamics of innovation activity and labor productivity demonstrates significant fluctuations due to economic and political factors, lack of qualified personnel and increased labor migration. resumption of innovation processes in a number of sub-sectors confirm the ability of the sector to adapt to external challenges in the presence of appropriate incentives.

Taking into account the identified trends, an important condition for the sustainable development of mechanical engineering is the modernization of production capacities, the introduction of innovative technologies, the diversification of the production structure and the strengthening of export potential. The implementation of such measures becomes possible under the condition of the formation of an integral institutional environment, within which legal, investment and innovation mechanisms should be organically combined. At the same time, the absence or insufficiency of any of these components significantly limits the industry's potential to strengthen its competitive position in the domestic and foreign markets.

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