International and Regional Economics

DOI: https://doi.org/10.12958/1817-3772-2024-4(78)-12-18

UDC 332.146.2:621

N. Bryukhovetska,

DrHab (Economics), Professor, ORCID 0000-0002-6652-4523, e-mail: buleev.ivan@gmail.com,

I. Bryl,

PhD (Economics), ORCID 0000-0003-1526-0094, e-mail: Bryl.irina@gmail.com,

O. Prykhodko,

ORCID 0000-0002-7425-1908, e-mail: prikhodko.iep@gmail.com, Institute of Industrial Economics of NAS of Ukraine, Kyiv

MECHANISMS TO SUPPORT THE ACTIVITIES OF MACHINE-BUILDING ENTERPRISES IN CRISIS CONDITIONS

Statement of the problem. The relevance of the research topic is due to the negative impact of the «corona crisis» on the real sector of Ukrainian economy, which deepens the existing systemic and creates latent problems of mechanical engineering, which are based on the loss of competitiveness by domestic manufacturers on the domestic and foreign markets, limited sources of investment development and a high share of imports. Therefore, effective incentives for the restoration of competitive domestic engineering and the development of the domestic market are needed, that can be implemented by systematic measures to support the state as an institution that has the power and appropriate resources for the economic growth of industry.

Military actions on the territory of Ukraine increased the negative impact of the «corona crisis» on the real sector of the economy. The existing systemic problems are deepening and new latent problems of the national industry development are emerging. It leads to the loss of competitiveness by domestic manufacturers on domestic and foreign markets, limiting sources of investment development and to a high share of imported goods and services. Many factories are destroyed. Therefore, new incentives and mechanisms are needed to restore production in the conditions of the mobilization economy.

Overcoming the crisis requires a long time and systematic measures. One of the directions can be state support for mechanical engineering and the development of the domestic market.

Developed and developing countries, at certain stages of socio-economic development, implemented measures of state support with the aim of increasing industrial and technological potential, reducing dependence on fluctuations in the foreign economic situation, developing the domestic market: flexible protectionism, direct subsidies from the budget, reduction of tax workload, mechanisms of customs policy and personnel support.

Today in Ukraine, there are several directions of state financial support, which provide compensation for the costs of domestic producers, in particular: state financial support for the agricultural sector; state financial support of micro and small business entities and support for export activities of national producers.

The state creates conditions for the functioning of industry in wartime [1; 2]. At the beginning of March, 74% of enterprises stopped their work, in April there were 21% of them, only 15% of businesses were able to increase production volumes. A business support course is currently being implemented. Thus, in the field of international trade, an agreement was reached with Great Britain, the European Union, and Canada on the abolition of import duties on Ukrainian goods. The EU also suspended for one year the collection of all antidumping duties on Ukrainian steel. The USA canceled the 25% tariff on Ukrainian steel. Canada does not plan to apply anti-dumping measures to rental cars from Ukraine. The key provisions of the new economic strategy for Ukraine have been developed, and the Plan for the post-war recovery of Ukraine's economy and industry is being formed. Its key tools are the government envisages deregulation, minimal state intervention in business operations, and localization at a level of at least 60%. The government expects that it is the private initiative that can withstand all the incredible loads and stabilize the economy in wartime.



© Publisher Institute of Industrial Economy of National Academy of Sciences of Ukraine, 2024 © Publisher State Higher Education Institution "Luhansk Taras Shevchenko National University", 2024 All this requires the generalization of state support experience and the search for ways to overcome obstacles to stimulating the development of mechanical engineering.

The purpose of the article is to provide practical recommendations for increasing the effectiveness of support mechanisms for machine-building enterprises in times of crisis.

Analysis of recent research and publications. The cessation destruction of the industrial potential determines the new role of state institutions regarding the activation of investment activities and the search for appropriate mechanisms to support mechanical engineering. Problems of the development of mechanical engineering in Ukraine are being studied [3–9].

Problems of implementation of mechanisms and instruments of state support for industrial enterprises are being investigated [10–16].

The issue of supporting national production and localization barriers in the economic policy of states (Local Content Requirements, LCR) is highlighted in numerous works of foreign scientists [17–19].

In the paper [20] four stages of the industrial revolution are presented and attention is focused on the features of the Fourth industrial revolution as a new industrial breakthrough, in which new information and communication technologies interact in production processes.

In the national report [21] of the Ukrainian leading economists there is a section «Engineering», where the work of the industry for 2000-2009 is analyzed and measures for its further development are planned. There is a low share of mechanical engineering in industrial output and GDP as well as substantiated programs for further development.

In the scientific report of the Institute of Industrial Economics of the National Academy of Sciences of Ukraine [22-23] the analysis of the mechanical engineering work for the period 2010-2016 is presented, proposals for improving the quantitative and qualitative indicators of the industry and individual enterprises are substantiated. At the same time, the role of mechanical engineering, its sub-sectors, technological chains and their impact on the results of work is not clearly defined.

Subsequently, these areas were developed in the work of specialists from the Institute of Industrial Economics of the National Academy of Sciences of Ukraine [20]. Studies of the state of mechanical engineering in Ukraine are devoted to the work of domestic experts in the field of economics [24–27].

The peculiarities of the development of innovative activity in the conditions of an imperfect sectoral structure of the economy are determined. The vector of innovative development of Ukrainian entrepreneurship is recognized as the integration of Ukraine into the EU and the application of medium and long-term programs and strategies. Burliai, 2020 determined the potential and factors of the innovative development of Ukraine in comparison with the innovative development of European countries [28].

The population of Ukraine in 2021 was 41.2 million, the labor force -17.4 million people, which was 42.2% of the population [29]. According to the Institute of demography and social research, at the beginning of 2023 the population is 37.6 million people, at the beginning of 2025 -33.6 million, in 2037 - about 30.5 million people according to an optimistic scenario [30]. With a reduction in the population to 33.6 million, the labor force will be 14 million people, which will not be enough for the full recovery of the industry.

Since the beginning of hostilities, about 8 million people have gone abroad, mostly of working age and with a high level of professional education (the average age of Ukrainian refugees was 36 years, while 76% of refugees in Poland have higher education). According to a study by the Center for economic strategy [31], 5.6– 6.7 million Ukrainians are abroad in June 2023. The largest share of Ukrainian refugees is in Germany (27%) and Poland (24%). According to the forecast, from 1.3 to 3.3 million Ukrainians may remain abroad. The National Bank of Ukraine concludes that Ukrainian refugees provide an additional impetus to the development of the economies of European countries as qualified workers, consumers of goods and taxpayers [32].

In the context of reducing the demographic potential of the country, reinforced by migration and military losses of the population, one of the priority tasks should be to improve the efficiency of managing the processes of forming and using the labor force [33]. It is expected that the post-war revival will lead to an increase in the need for workers, whose shortage in certain parts of industry was acutely felt in the pre-war period.

Presentation of the main research material. Analysis shows [34], that the most intellectually and professionally trained part of the middle class was formed in mechanical engineering. Mechanical engineering provides a high level of labor productivity, culture of production, science, contributes to the further division of labor, softening the stratification of society in terms of income and growth opportunities.

Different states deal with these issues in different ways. Thus, the PRC develops industry and engineering through domestic and foreign investment, the United States – by returning its companies and factories from abroad to its country, the EU countries – through the development of modern industry and engineering in the countries that make up the core of the EU (Germany, France, Italy), Great Britain and Japan - by protecting domestic markets and state support for manufacturers.

In the economic policy of most developing and post-socialist countries, the development of individual companies, high technologies take place, traditional enterprises and industries are significantly reduced (Poland, Bulgaria, the Republic of Korea).

Ukraine is currently following the deindustrialization path of industry and engineering. After 2014, the goal of creating an agro-industrial superpower was set. However, even an agrarian country must have a certain base of mechanical engineering, modern technologies and science-intensive industries. The totality of the above issues, the need to solve them are very relevant for the domestic engineering industry.

Used methods and approaches: historical, evolutionary, comparative analysis and synthesis.

It is believed that only when the share of mechanical engineering in the structure of the industrial complex exceeds 30%, the country can provide technical re-equipment of the national industry, the economy becomes self-sufficient.

In economically developed countries, the specific weight of mechanical engineering in the production of industry is from 30 to 60%. In Germany, this indicator is 53.6%, in Japan – 51.5%, England – 39.6%, China – 35.4% [35], Hungary - 49%, Slovenia – 36%, South Korea – 34%. In Ukraine, in 1991, the share of mechanical engineering in the structure of the industrial complex was more than 30%. In 2019, the volume of machine-building products sold as part of industrial products amounted to 7.6% (State Statistics Service of Ukraine).

There are other indicators for assessing foreign engineering [36], according to which in the USA mechanical engineering reaches 29% of industrial production, in Switzerland - 30%, in Germany - 42%. In the EU, the share of mechanical engineering in industrial output is 36-45%, including in Germany – 53.6%, Italy – 36.4%. In other countries: Japan – 51.52%, Great Britain – 36.6%, China – 35.21%. In the USA, the contribution of mechanical engineering to GDP is 5-10%, in the Russian Federation – 18% (Machine-building industry of Ukraine). Such a scatter of indicators indicates the need to improve the indicators themselves and methods for their assessment.

Analysis of the share of mechanical engineering in industry

In foreign countries, mechanical engineering in the value of products of the processing (manufacturing) industry is (Machine-building complex of Ukraine and the world):

- 33-38% in developed countries;

- 23-26% in newly industrialized countries;

- up to 10% in developing countries.

Modern directions of the world mechanical engineering development: science intensity (used ½ all expenses for research and development); miniaturization of machines; creation of machine complexes. There is a high specialization by country in the branches of engineering. So, six countries (Japan, Germany, USA, Italy, Switzerland, France) produce 75% of machine-tool products, and its export reaches 75%. It is due to the high qualification of the staff, modern technologies, scientific and design developments, the general high level of training and education in society.

In the 90s of the twentieth century, Ukraine was one of the 10 most developed industrial states in Europe, having a fairly modern, according to the criteria of that time, the structure of industry and engineering. The share of industry (section B, C, D according to KVED) in Ukraine's GDP in 1991 was 45%. Mechanical engineering in Ukraine in 1990 provided up to 14% of GDP, and its share in industry reached 30.5% [37].

The most powerful machine-building enterprises of Ukraine before the war were: «Azovmash» (Mariupol); SE «Electrovajmash Plant» (Kharkiv); «Kremenchuk Automobile Plant»; «Lvivsilmash»; «Lviv Bus Plant»; «Nikopol Crane Construction Plant»; «Southern Machine-Building Plant» (Dnipro); «Poltava Turbomechanical Plant»; «Sumy Machine-Building Research and Production Association»; «Turboatom» (Kharkov); «Kharkiv Plant of Tractor Engines»; «Kharkiv Tractor Plant»; «Kherson Machine-Building Plant» and others.

By 2020, the share of mechanical engineering in Ukraine has decreased to 7-12% of industrial production. By 2019, the machine-building industry of Ukraine included more than 11,000 enterprises of various forms of ownership and size, level of technology, etc., 15% of fixed assets, 6% of current assets, up to 20% of industry workers. The share of mechanical engineering in GDP is decreasing, in recent decades it is no more than 7%. It should be borne in mind that GDP is also steadily declining. The volumes in physical units are decreasing. Thus, the production of boring, drilling and milling machines decreased from 3715 in 2003 to 76 in 2010 (Ranking of countries in finance).

Exports decreased from \$13.2 billion in 2012 to \$5 billion in 2018. Imports significantly exceed deliveries abroad. The state did not provide enough assistance in increasing the quotas for the supply of products to Europe, in the development of world markets.

Civil servants recognize the leading role of mechanical engineering in the economy. The Committee of the Verkhovna Rada on Industrial and Regulatory Policy and Entrepreneurship recognizes mechanical engineering as one of the priority industries of Ukraine. Draft law No. 9310 provides for the granting of benefits to machine-building enterprises and the simplification of customs procedures: the payment of import duty for certain goods is canceled; the tax rate on profit from the sale of machine-building products for export is decreasing. Our research shows that the application of these measures will contribute to business processes at machine-building enterprises.

The Ministry of Strategic Industries of Ukraine (Department of Industry) aims to promote the investment activity of industrial enterprises. Thus, in August 2021, a tender was announced for an investment project for the creation of a new manufacturing enterprise or the reconstruction and restoration of an existing manufacturing enterprise with more than 500 employees. The selection criteria are entirely related to state policy, namely:

1) state industrial policy;

2) state military-industrial policy;

3) state policy in the field of state defense procurement, defense-industrial complex;

4) state policy in the aircraft industry, in the field of space activities.

The managers of the enterprises have some experience of transportation and setting up production in other regions. For example, «Korum Druzhkiv Machine-Building Plant» lost the assets of Horliv Machine-Building Plant and Donetskhormash in the uncontrolled territories of Donbas. The company quickly mastered the production of new products in the West of the country. The plant previously produced mechanized fasteners and underground mine transport. The qualifications of management and employees were sufficient to establish a new production: tunneling combines, main ventilation fans, mine stationary equipment and equipment for the metallurgical industry. In order to work in military conditions and simplify the relocation procedure, managers consider it necessary to focus on the following areas:

- preservation of production potential;

- provision of preferential tariffs for transportation of business equipment and capacities;

- state support in restoring logistics, purchasing raw materials and finding sales markets;

- support of local authorities. Ensuring prompt connection of the production capacities of relocated enterprises to gas, water, electricity and other engineering communications;

- provision of informational and organizational assistance in the placement of employees of displaced enterprises [38].

The experience of developed countries shows that modern engineering is capable of stabilizing the work of industry and accelerating the recovery of the economy, meeting the needs of the population by at least 80% with products and services of its own production. It shows the necessity for the state authorities and civil society to actively cooperate on the principles of public-private and public-private partnership.

In the scientific society of Ukraine and among those in power, a stable idea is being formed about the need to stop the destruction of industrial potential, to ensure the revival of traditional industries and reproduction on a modern technological basis. The actions of the Ministry of Strategic Industries of Ukraine regarding the preparation of the Law of Ukraine «On State Industrial Policy» deserve attention» [39]. Its tasks are planned to define the following:

1) maintaining optimal production volumes and increasing the competitiveness of industries that are based mainly on the use of their own material base and have developed sales markets;

2) the development of knowledge-intensive specialized industries, for which Ukraine already has or can have high competitive positions on a regional and global scale, and on this basis, the formation of modern competitive industrial structures of a national basis in the sector of high-tech industries;

3) comprehensive restructuring of industries with low competitive characteristics and potential, the need for functioning and development of which is determined by national security, social and environmental requirements;

4) development of a system of public-private partnership in the field of industry.

Military actions on the territory of Ukraine pose many threats to its industrial potential and require immediate measures of mobilization of the economy. The state should become the leading force in this process in order to mobilize domestic resources and ensure the development of the domestic market with the available volume of foreign aid. For these purposes, it will be effective to solve the following problems:

- support of domestic demand and development of the domestic market;

- ensuring macroeconomic stability;

- preservation of industrial production, including civilian production;

- the use of obsolete equipment for the production of simple things, the development of an economy of medium complexity and technologies;

- advance training of personnel;

- effective use of foreign aid for the development of industry, preservation of the number of jobs in the territory of Ukraine;

- state policy of support for the export of Ukrainian producers of final goods.

The totality of measures to preserve the stability of the economy in wartime conditions will create prerequisites for structural restructuring and post-war recovery.

Conclusions. Military actions cause great losses, the dynamics of their changes cannot be predicted. The restoration of traditional and creation of new machinebuilding enterprises requires a certain amount of time and effort. In economic policy, the issue of reproduction of some industries on a new technological basis is raised. It determines the new role of state institutions regarding the activation of investment activities, the search for appropriate mechanisms to support mechanical engineering.

For the successful development of the country, modern mechanical engineering is necessary, which ensures its own progress and the progress of industry and the economy as a whole. Currently, we consider it acceptable to focus on our own raw material base, training and retention of highly qualified personnel, building a system of public-private partnership. This requires well-founded tools and mechanisms of state influence on the activities of industrial enterprises in wartime.

The issue of restoring the industrial potential of the state in post-COVID conditions based on the use of internal resources and the development of the internal market requires active state support measures for the growth of mechanical engineering as a leading industry in ensuring the socio-economic interests of Ukraine.

In the future, we will actually be talking about a new industrialization – the reindustrialization of production in mechanical engineering. This requires the involvement of recovery mechanisms and the creation of a modern industry on a new technological basis. For this, the following conditions must be implemented:

- inventory of real material, financial and labor resources of the state;

- preservation and expansion of the domestic market;

- preservation and adjustment of the economy of simple things for the production of goods for the population;

- concentration of material and human resources on new science-intensive activities;

- determination and ranking of strategic priorities for industrial recovery;

- ensuring the country's economic security;

- development and implementation of projects of localization, import substitution, support of national production;

- training of high-tech workforce;

- review of the state request for personnel training in relevant fields.

Effective state instruments and measures of stimulation become the following:

- an effective tax and credit policy aimed at attracting private funds to innovative processes of reindustrialization of production;

- establishing a private-state partnership with the appropriate distribution of tasks and functions, which prevents corruption deals;

- formulation of goals for the reconstruction of industry on a new technological basis and development of the economy of simple things.

The mechanism for managing the recovery of industry and engineering should provide for the following:

- justification and formulation of strategic tasks of industrial development;

- identification of qualitative and quantitative parameters of industry potential;

- assessment of the degree of compliance of the potential with the set strategic tasks;

- determination of priority sectors for the recovery and reindustrialization of industry, taking into account national interests;

- monitoring and adjusting the recovery and new industrialization program.

In the future, the various scenarios development for the development of machine-building enterprises is provided in accordance with the methods and mechanisms of state participation, the necessary resources, risks and consequences for industry, the domestic market and business. The development of proposals will contribute to the post-war structural restructuring, the reproduction of production chains in industry on its own material and technical base, the creation of new jobs and the equalization of the socioeconomic status of conflict regions.

References

1. Svyridenko, Yu. (2022). Druhyi front velykoi viiny: Yak Ukraina pereishla do voiennoi ekonomiky [The Second Front of the Great War: How Ukraine Transitioned to a War Economy]. *Business*. June 8. Retrieved from https://biz.nv.ua/ukr/experts/shcho-vidbuvayetsya-z-ukrajinskoyu-ekonomikoyu-zaraz-pid-chas-viyni-ministr-ekonomiki-sviridenko-50248351.html [in Ukrainian].

2. Chorna, O. A., Bryukhovetskyi, Y. S. (2022). Mobilizatsiina ekonomika v Ukraini: ohliad derzhavnykh priorytetiv ta mozhlyvostei vykorystannia tsyfrovykh instrumentiv [Mobilization economy in Ukraine: a review of state priorities and opportunities for using digital tools]. *Ekonomichnyi visnyk Donbasu – Economic Herald of the Donbas*, 3 (69), pp. 15-26. DOI: https://doi.org/10.12958/1817-3772-2022-3(69)-15-26 [in Ukrainian].

3. Korytko, T. Yu., Bryl, I. V. (2021). Intelektualnyi kapital pidpryiemstva ta yoho otsinka v umovakh tsyfrovizatsii [Intellectual capital of the enterprise and its assessment in the conditions of digitalization]. *Econ. promisl.*, 1(93), pp. 92-110. DOI: https://doi.org/10.15407/econindustry2021.01.092 [in Ukrainian].

4. Geets, V. (2014). Instytutsiina obumovlenist innovatsiinykh protsesiv u promyslovomu rozvytku Ukrainy [Institutional conditioning of innovative processes in the industrial development of Ukraine]. *Ekon. Ukr.*, 12, pp. 4-19. [in Ukrainian].

5. Danylyshyn, B. (2017). Yak ukraini Povernutysia v klub promyslovo rozvynenykh krain [How can Ukraine return to the club of industrialized countries]. *Dzerkalo tyzhnia – Mirror of the week*, Issue 46, December 2 – December 8. Retrieved from https://dt.ua/promyshliennost/yak-ukrayini-povernutisya-v-klub-promislovo-rozvinenih-krayin-262070_.html [in Ukrainian].

6. Kyzym, M. O., Oliynyk, A. D., Matyushenko, I. Yu., Khaustova, V. E., Omarov, Sh. A. O., Moiseyenko, Yu. M., Buntov, I. Yu. (2014). Mozhlyvosti ta zahrozy vid chlenstva Ukrainy v SOT dlia mashynobuduvannia v umovakh spivpratsi z krainamy YeS i Mytnoho soiuzu YevrAzES [Opportunities and Threats of Ukrainian Membership in WTO for Engineering under Conditions of Cooperation with EU Countries and Customs Union of Belarus, Kazakhstan and Russia]. *Biznes Inform – Business Inform*, 2, pp. 59-70 [in Ukrainian].

7. Cherep, A. V., Soloviova, N. V. (2016). Modernizatsiia orhanizatsii vyrobnytstva pidpryiemstv mashynobuduvannia na zasadakh innovatsiinoho rozvytku [Modernization of the production organization of machine-building enterprises on the basis of innovative development]. *Derzhava ta rehiony. Seriia: Ekonomika ta pidpryiemnytstvo – State and regions. Series: Economy and Entrepreneurship*, 3, pp. 63-66 [in Ukrainian].

8. Romanenko, V. A. (2013). Rozvytok mashynobuduvannia v Ukraini: systemnyi pidkhid [Development of mechanical engineering in Ukraine: a systematic approach]. *Ekon. Ukr.*, 10(623), pp. 56-66 [in Ukrainian].

9. Chupyr, O. M. (2013). Тенденції розвитку машинобудівного комплексу України: сучасний стан і перспективи [Trends in the development of the machine-building complex of Ukraine: current state and prospects]. Вісник економіки транспорту і промисловості – Herald of the economy of transport and industry, 43, pp. 99-103 [in Ukrainian].

10. Korytko, T. Yu. (2023). Otsinka vplyvu dysbalansiv v umovakh transformatsii ekonomiky [Assessment of the impact of imbalances in the conditions of economic transformation]. *Ekonomichnyi visnyk Donbasu – Economic Herald of the Donbas*, 3(73), pp. 71-81. DOI: https://doi.org/10.12958/1817-3772-2023-3(73)-71-81 [in Ukrainian].

11. Guzhva, I. Yu. (2015). Torhovi domy ta eksportno-kredytni ahentstva v systemi derzhavnoi polityky spryiannia eksportu [Trading houses and export credit agencies in the system of export promotion policy]. *Formuvannia rynkovykh vidnosyn v Ukraini – Formation of market relations in Ukraine*, 12, pp. 93–96 [in Ukrainian].

12. Volosovych, S. V. (2017). Eksportno-kredytni ahentstva yak instytut [Export credit agencies as a development institution]. Zovnishnia torhivlia: ekonomika, finansy, pravo – Foreign trade: economy, finance, law, 4, pp. 98–107 [in Ukrainian].

13. Ivanova, I. M. (2015). Derzhavna pidtrymka eksportu yak instrument zakhystu natsionalnykh interesiv: dosvid YeS, SOT ta uroky dlia Ukrainy [State export support as a tool for protecting national interests: experience of the EU, WTO and lessons for Ukraine]. *Stratehichni priorytety – Strategic priorities*, 1, pp. 51-55 [in Ukrainian].

14. Halasiuk, V. V. (2018). Eksportno-kredytne ahentstvo yak mekhanizm rozvytku vysokotekhnolohichnoho eksportu Ukrainy [Export credit agency as a mechanism for the development of high-tech exports of Ukraine]. *Naukovyi visnyk Uzhhorodskoho natsionalnoho universytetu – Scientific Bulletin of the Uzhhorod National University*, 18 (1), pp. 89-93 [in Ukrainian].

15. Danylenko, A. I. (2019). Finansuvannia ta ekonomichni metody stymuliuvannia naroshchennia vypusku konkurentospromozhnoi produktsii [Financing and economic methods of stimulating the increase in the production of competitive products]. *Finansy Ukrainy – Finances of Ukraine*, 7, pp. 7-34. DOI: https://doi.org/10.33763/finukr2019.07.007 [in Ukrainian].

16. Stone, S., Flaig D., Van Tongeren F. (2014). Modelling Local Content Requirements: Quantitative Restrictions in a CGE Model. *OECD, Trade and Agriculture Directorate*. Retrieved from https://www.gtap.agecon.purdue.edu/resources/download/ 7203.pdf.

17. Ankeny, C. (2016). Local Content Requirements: Measures Intended to Boost Domestic Industry Boomerang to Bring Failure. Retrieved from https://www.itic.org/news-events/techwonk-blog/local-content-requirements-measures-intended-to-boost-domestic-industry-boomerang-to-bring-failure.

18. Deringer, H., Erixon, F., Lamprecht, P., Marel, E. (2018). The Economic Impact of Local Content Requirements: A Case Study of Heavy Vehicles. *Ecipe Occasional Paper*, 1. Retrieved from https://ecipe.org/wp-content/uploads/2018/01/LCR-Paper-final-2-KL.pdf.

19. Kraus, K., Kraus, N., Buzhdykhan, K. (2022). The fourth industrial revolution as a driver of digitization of production and urbanization. *VUZF Review*, 7 (1), pp. 177-191. DOI: https://doi.org/10.38188/2534-9228.22.1.18.

20. Heiets, V. M. (Ed.). (2009). Sotsialno-ekonomichnyi stan Ukrainy: naslidky dlia narodu ta derzhavy [Socio-economic state of Ukraine: consequences for the people and the state]. Kyiv, NVTs NBUV [in Ukrainian].

21. Amosha, O. et al. (2017). Promyslovist Ukrainy 2014-2016: nevykorystani mozhlyvosti, shliakhy vidnovlennia, modernizatsii ta suchasnoi rozbudovy [Industry of Ukraine 2014-2016: unused opportunities, ways of recovery, modernization and modern development]. Kyiv, IIE of NAS of Ukraine [in Ukrainian].

22. Amosha, O., Bryukhovetska, N., Buleev, I. (2020). Industry as a dominant factor in the formation of a self-sufficient economy of Ukraine. *Ekonomichnyi visnyk Donbasu – Economic Herald of the Donbas*, 4, pp. 30-37. DOI: https://doi.org/10.12958/1817-3772-2020-4(62)-30-37.

23. Bryukhovetska, N. Yu. Chernykh O. (2020). Industriia 4.0 ta tsyfrovizatsiia ekonomiky: mozhlyvosti vykorystannia zarubizhnoho dosvidu na promyslovykh pidpryiemstvakh Ukrainy [Industry 4.0 and digitalization of the economy: opportunities for using foreign experience at industrial enterprises of Ukraine]. *Econ. promisl.*, 2(90), pp. 116-132. DOI: https://doi.org/10.15407/econindustry2020.02.116 [in Ukrainian].

24. Zarichna, T. S., Tarasova K. I. (2019). Mashynobuduvannia Ukrainy: suchasnyi stan, struktura ta tendentsii rozvytku haluzi [Mechanical engineering of Ukraine: current state, structure and development trends of the industry]. *Statystyka – instrument sotsialno-ekonomichnykh doslidzhen* [*Statistics – a tool of socio-economic research*]. (Issue 5, Part 1, pp. 68-76). Odesa, ONEU [in Ukrainian].

25. Onishchenko, V. P., Huzhva, I. Yu. (2017). Stymuliuvannia natsionalnoho eksportu [Stimulation of national exports]. Zovnishnia torhivlia: ekonomika, finansy, pravo – Foreign trade: economy, finance, law, 6, pp. 33–47 [in Ukrainian].

26. Sydorov, D. (2022). Tetiana Kaluhina: «Korum Druzhkivskyi mashynobudivnyi zavod» vzhe vdruhe provodyt uspishnu ta, na zhal, vymushenu relokatsiiu» [Tetyana Kalugina: "Korum Druzhki Machine-Building Plant" is carrying out a successful and, unfortunately, forced relocation for the second time"]. *Ekonomichna pravda*, 9 (1253). Retrieved from https://e-b.com.ua/tetyana-kalugina-korum-druzkivskii-masinobudivnii-zavod-vze-vdruge-provodit-uspisnu-ta-na-zal-vimusenu-relokaciyu-4236 [in Ukrainian].

27. Korotkyi, Y. V. (2015). Mashynobudivna promyslovist Ukrainy: zdobutky ta perspektyvy [Machine-building industry of Ukraine: achievements and prospects]. Naukovyi visnyk Mizhnarodnoho humanitarnoho universytetu. Seriia : Ekonomika i menedzhment – Scientific Bulletin of the International Humanitarian University. Economics and management, 1, pp. 117-120 [in Ukrainian].

28. Burliai, O. L., Smerteniuk, I. I. (2020). Innovatsii yak instrument adaptatsii silskohospodarskykh pidpryiemstv do klimatychnykh zmin [Innovations as a tool for adapting agricultural enterprises to climate change]. *Modern Economics*, 23, pp. 26-30. DOI: https://doi.org/10.31521/modecon.V23(2020)-04 [in Ukrainian].

29. Sokolova, L. V., Stoika, O. V. (2019). Suchasnyi stan mashynobuduvannia Ukrainy ta tendentsii yoho rozvytku za umov nezbalansovanoi ekonomiky [The current state of mechanical engineering in Ukraine and trends in its development under the conditions of an unbalanced economy]. *Efektyvna ekonomika*, 11. DOI: https://doi.org/10.32702/2307-2105-2019.11.5 [in Ukrainian].

30. Pihul, N. H., Pihul, Ye. I. (2018). Suchasnyi stan ta perspektyvy rozvytku mashynobudivnoho kompleksu Ukrainy [The current state and prospects for the development of the machine-building complex of Ukraine]. *Ekonomika ta suspilstvo – Economy and society*, 15. pp. 444-449 [in Ukrainian].

31. Horiashchenko, Yu. (2022). Comparative analysis of innovative and socio-economic development of enterprises and other purposeful systems. *VUZF Review*, 7(1), pp. 97-107. DOI: https://doi.org/10.38188/2534-9228.22.1.10.

32. Chyselnist naselennia ta robochoi syly u 2021 rotsi [Population and labor force size in 2021]. *State Statistics Service of Ukraine*. Retrieved from https://www.ukrstat.gov.ua/ [in Ukrainian].

33. Skilky ukraintsiv? Viina vbyvaie nas skorishe, nizh demohrafy vstyhaiut rakhuvaty [How many Ukrainians? The war is killing us faster than demographers can count]. (2023). *Hromadske*, June 19. Retrieved from https://hromadske.ua/posts/skilki-

ukrayinciv-vijna-vbivaye-nas-skorishe-nizh-demografi-vstigayutrahuvati?gclid=CjwKCAjwvrOpBhBdEiwAR58-3DEe9nAxLOYh-iv69DFP4ohDuVhNDafz4PMO9IS77wxRgf7Yezq YyRoCg3MQAvD_BwE [in Ukrainian].

34. Bizhentsi z Ukrainy: khto vony, skilky yikh ta yak yikh povernuty? [Refugees from Ukraine: Who are they, how many are there, and how to return them?]. *Final report*. Retrieved from https://ces.org.ua/refugees-from-ukraine-ukr-final-report/ [in Ukrainian].

35. Ukrainski mihranty v Yevropi – ne tiahar, a tsinnyi liudskyi kapital. Yak vymusheni pereselentsi z Ukrainy nadaiut dodatkovoho impulsu yevropeiskii ekonomitsi [Ukrainian migrants in Europe are not a burden, but valuable human capital. How forced migrants from Ukraine provide additional impetus to the European economy]. (2022). *Ekonomichna pravda*, 15. Retrieved from https://www.epravda.com.ua/columns/2022/12/15/695056 [in Ukrainian].

36. Novikova, O. F., Zaloznova, Yu. S., Antonyuk, V. P. et al. (2024). Otsinka problem i mozhlyvostei zabezpechennia promyslovosti robochoiu syloiu v umovakh voiennoho stanu ta povoiennoi rozbudovy Ukrainy [Assessment of problems and opportunities of providing industry with labor force under martial law and post-war development of Ukraine]. Kyiv, IIE of NAS of Ukraine. 108 p. [in Ukrainian].

37. Amosha, O. I., Bryukhovetska, N. Yu., Buleev, I. P. (2021). Pro vidnovlennia providnoi roli mashynobuduvannia v pobudovi novoi ekonomiky Ukraing [On the restoration of the leading role of mechanical engineering in the construction of the new economy of Ukraine]. *Ekonomichnyi visnyk Donbasu – Economic Herald of the Donbas*, 2 (64), pp. 94–107. DOI: https://doi.org/10.12958/1817-3772-2021-2(64)-94-107 [in Ukrainian].

38. Dykan, V. L. (2014). Mekhanizm vidtvorennia mashynobudivelnoho kompleksu Ukrainy v umovakh lohistychnoi intehratsii [The mechanism of restoration of the machine-building complex of Ukraine in the conditions of logistic integration]. *Visnyk ekonomiky transportu i promyslovosti – Herald of the economy of transport and industry*, 47, pp. 9-14. [in Ukrainian].

39. Korytko, T., Piletska, S. (2022). Model of the Adaptive Management System of an Industrial Enterprise in the Conditions of Industry 4.0. *Ekonomichnyi visnyk Donbasu – Economic Herald of the Donbas*, 4 (70), pp. 76-88. DOI: https://doi.org/10.12958/1817-3772-2022-4(70)-76-88.

Брюховецька Н., Бриль I., Приходько О. Механізми підтримки діяльності машинобудівних підприємств в умовах кризи

Низька сприятливість машинобудівних підприємств до інвестицій та адаптації до зовнішніх і внутрішніх викликів і загроз формують необхідність пошуку ефективних механізмів функціонування та розвитку. Держава як інституція, що володіє владою, коштами та іншими ресурсами, у своїй діяльності здатна нівелювати та компенсувати ризики невизначеності, сприяючи розширенню внутрішнього ринку та використовуючи механізми активізації внутрішніх ресурсів розвитку.

Орієнтація України на відновлення конкурентоспроможності машинобудівної галузі у повоєнних умовах вимагає виваженого підходу до розуміння нової ролі держави, можливостей використання необхідних механізмів та інструментів державної підтримки вітчизняних підприємств.

Розробки та результати наукових досліджень можуть бути використані в діяльності державних і регіональних органів державної влади та управління, промислових підприємств, інтегрованих структур, навчальних закладів у формуванні та реалізації промислової політики, визначенні державних пріоритетів та механізмів розвитку, консолідації внутрішніх національних ресурсів, зміцненні національних ресурсів, розвитку промисловості та ін. відновлення та модернізація промислового виробництва в умовах мобілізаційної економіки.

У подальшому передбачається розробка різноманітних сценаріїв розвитку машинобудівних підприємств відповідно до методів та механізмів участі держави, необхідних ресурсів, ризиків та наслідків для промисловості, внутрішнього ринку та бізнесу. Розробка пропозицій сприятиме післявоєнній структурній перебудові промисловості.

Ключові слова: машинобудування, державна підтримка, держава як інститут влади та ресурсів, механізми та інструменти державної підтримки, відродження внутрішнього ринку, мобілізаційна економіка.

Bryukhovetska N., Bryl I., Prykhodko O. Mechanisms to Support the Activities of Machine-Building Enterprises in Crisis Conditions

The low favorability of machine-building enterprises to investments and adaptation to external and internal challenges and threats form the need to find effective mechanisms of functioning and development. The state, as an institution that has power, funds and other resources, in its activities is capable of leveling and compensating the risks of uncertainty, promoting the expansion of the domestic market and using mechanisms to activate internal development resources.

Ukraine's orientation towards the restoration of competitive machine-building industries in post-war conditions requires a balanced approach to understanding the new role of the state, the possibilities of using the necessary mechanisms and state support tools for domestic enterprises.

A set of measures related to activities under martial law, creation of prerequisites for structural restructuring and post-war recovery of enterprises is provided. It ensures macroeconomic stability, supporting domestic demand, preserving industrial production and jobs on the territory of Ukraine, targeted use of foreign aid.

Developments and research results can be used in the activities of state and regional government and management bodies, industrial enterprises, integrated structures, educational institutions in the formation and implementation of industrial policy, determination of state priorities and development mechanisms, consolidation of internal national resources, restoration and modernization of industrial production according to conditions of the mobilization economy.

In the future, the development of various scenarios for the development of machine-building enterprises is provided in accordance with the methods and mechanisms of state participation, the necessary resources, risks and consequences for industry, the domestic market and business. The development of proposals will contribute to the post-war structural restructuring of industry.

Keywords: mechanical engineering, state support, the state as an institution of power and resources, mechanisms and tools of state support, revival of the internal market, mobilization economy.

Received by the editors: 04.10.2024 Reviewed: 24.10.2024