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Current trends in the military-industrial integration of the EU countries and implications for Ukraine

Abstract. In the face of common security challenges, the issue of protecting civilised countries from external military aggression is of utmost importance for the entire European continent. The research aims to analyse the existing integration processes in Europe and extrapolate them to the military-industrial complex of Ukraine since the Ukrainian state is an outpost of the European Union, where the entire range of modern military technologies is used. The objectives of the study are to identify trends in the military industries of the leading European countries and to assess the prospects for their further integration in the context of the current external military aggression. The key indicators were collected and analysed using statistical and regression analysis, as well as the longitudinal method. The study provided results on the development of defence spending in individual countries, data on the participation of EU countries in joint projects, the scope of sanctions imposed on the aggressor country, indicators of Ukraine's participation in the common customs area, and the volume of military assistance from partner countries. The analysis of the data led to the conclusion that the defence capability of both Ukraine and the entire European Union has significantly improved. It was also found that the replacement of outdated Soviet standards with modern Western ones has led to a significant increase in defence capabilities. In addition, the study found that the unjustified armed aggression against Ukraine strengthened relations between the countries of the European Defence Agency and gave them an impetus to develop collective defence capabilities and conclude joint agreements involving military-industrial complexes. From a practical point of view, the obtained indicators of changes on the continent made it possible to draw conclusions about the directions of further integration and to correct the identified shortcomings

Keywords: weapons; war; weapons standards; re-equipment; defence technology; security strategy

Introduction

For centuries, the concept of common security has been one of the ideas underpinning the worldview of a united Europe. After the Second World War, in addition to purely economic and political factors, the governments and peoples of post-war Europe needed a guarantee to prevent another war and to some extent to "bind" the countries together through a series of strong economic, trade, cultural and educational relations, the breakdown of which would be a much greater loss for the participant than the potential benefits of new conquests. That is why, along with the signing of the Treaty on the European Union (EU) in Maastricht in 1992, the concept of a common foreign and security policy for the new political entity was also enshrined (Treaty No. 994_017..., 1992).

However, as of 2023, the issue of security on the European continent is more urgent than even on the eve of the Second World War, as the threat from the aggressor country, russia is no longer potential or possible, but real. Ukraine has managed to keep the enemy from direct aggression in the EU with great effort, but the risk of terrorist acts remains high.

Accordingly, the importance of military integration is growing. In particular, K. Kyzymenko & M. Kravchenko (2021), analysing the experience of leading European countries in ensuring efficiency in the field of military-industrial policy, concluded that for the practical implementation of security programmes, it is necessary to introduce innovative technologies in the defence sector, create special independent funds for advanced research, and introduce military innovation technological policies.

T. Kim & Yu. Ukrainets (2022) concluded that the military-industrial complexes, due to their specificity, should be artificially restrained from uncontrolled development and not turn from a deterrent into a threat. The authors

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compared the key economic indicators of several countries with the dynamics of their militarisation and called for additional control over the development of the military-industrial complex by reputable international organisations.

Participation in the European Defence Agency (EDA) is an important and relevant aspect of the mutual military-industrial integration of European countries. To O. Vojtech & K. Vojtech (2022), the urgent need to strengthen cooperation has become more acute due to the full-scale invasion of Ukraine. Due to the previous preparatory work towards integration with Ukraine, the EDA, as an institution that manages the level of logistics in the defence sector, promptly resumed its coordination and facilitated further cooperation between the military-industrial enterprises.

The United Kingdom, a country with centuries-old traditions of military leadership, remains an important factor in influencing the security of the EU and the entire continent even after its withdrawal from the European Union in 2020. As Yu. Stuzhuk (2022), the UK is one of Ukraine's key partners in helping to counteract aggression and taking the most steadfast, uncompromising, and unequivocal position. It was the UK that initiated the transfer of fundamentally new types of weapons to Ukraine several times, without having to coordinate such decisions with the rest of the EU after Brexit.

In addition to the purely European dimension of the issue, consideration should also be given to the impact on continental security of the world's largest defence alliance, the North Atlantic Treaty Organisation (hereinafter - NATO). K. Kulahin *et al.* (2022) in their study of the life cycles of sophisticated weapons in NATO countries found out the availability and sufficiency of the necessary prerequisites for the implementation of these technologies in the Armed Forces of Ukraine (hereinafter – AFU) and proposed a corresponding Roadmap, considering NATO policies and standards.

A somewhat unusual, but no less important dimension of combining the standards of the defence industry of different countries is the issue of terminology. O. Kruglii (2022) studied this issue on the example of problems with the adaptation of foreign military terms into Ukrainian and formed three key principles for translating military terminology into another language: accurate translation of individual military terms; verification of each term in terms of the terminology system it is part of in the original language, as well as taking into account the differences in terms due to the specifics of each language.

At the same time, despite the extensive study of various aspects of the topic of military technology integration, there is no updated comprehensive data yet, and the study aims to fill this gap. The research aims to analyse updated indicators in such areas as defence industry financing, economic security, and economic diplomacy and to understand current trends in the development of a united Europe in the realities of a full-scale war.

Materials and Methods

Methods such as statistical analysis and forecasting were used in the study. The study also analysed the dynamics of indicators over a certain period to identify trends, and for some indicators, the materials allowed the use of a longitudinal method, when the analysis period covered up to 17 years, from 2005 to 2021.

To understand the integration of the EU defence industries, the statistics of the European Defence Agency (2021) were used up to 2021, as the last year for which the final report was compiled. To understand the overall picture, 12 representative countries were randomly selected from four conventional EU regions – Western Europe, the Mediterranean, Eastern Europe, and the Baltic States. These countries were analysed for such key indicators as total defence spending, total defence investment and defence spending as a percentage of GDP. The Agency's aggregate statistics were also compiled and visualised in a line graph format.

To better understand the innovation processes occurring in the EU defence structures, an empirical study was conducted and the correlation between GDP and defence spending of the studied countries was estimated using regression analysis. Also, based on the processed data, a theoretical model of integration for Ukraine was developed.

The study also examined the integration of countries in the defence sector within the European Union, where the European Cooperation Index was used to obtain the volume of agreements concluded between at least two EU member states' ministries of defence-on-defence projects.

As part of the study of the impact of the EU's military integration on Ukraine, the amount of assistance received by the country since the beginning of the full-scale military aggression was studied based on data obtained from open sources. In particular, two areas were analysed - on the one hand, financial assistance provided by partners to compensate for military expenditures and purchase necessary military equipment, and on the other hand, direct transfers of weapons, ammunition, military equipment, and machinery.

For a more objective understanding of the assistance processes, statistics for the period from January 2022 to February 2023 were studied. The amount of aid transferred for each EU country was also compared with the national GDP, from which the corresponding percentage was calculated, which made it possible to perceive the support of partners not only in absolute terms but also following the actual capabilities of a particular economy. In this way, the countries whose contribution is the largest in terms of economic size were identified.

The data obtained were analysed, systematised, and compared, which allowed us to conclude the degree of military integration of Europe, the impact of the beginning of military aggression against Ukraine on this process, and changes in aid policy.

Results

To understand the participation of each EU country in the common defence policy, the contribution of each country was examined in terms of three key parameters: total direct defence spending in absolute terms (EUR); total defence investment in absolute terms (EUR); and the percentage of defence spending as a share of GDP.

To obtain objective information without having to reload data from all 27 countries of the European Defence Agency, it was decided to randomly select three representative countries from each conventional EU area. The powerful economies of Western Europe were represented by Germany, France and Belgium, the indicators of Southern Europe were assessed for Greece, Italy and Spain, Eastern Europe was represented by the defence spending of the Czech Republic, Poland and Hungary, and the countries of the former Soviet Union were represented by Lithuania, Latvia and Estonia. Thus, information from 12 different economies was processed, and then the total data of the entire EDA was analysed. The data for Germany is shown in Table 1.

Table 1. Key indicators of German defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	40265	42127	46936	51392	52431
Total defence investments, EUR million	4886	5373	7113	8969	9350
Total defence expenditures as a percentage of GDP, %.	1.23%	1.25%	1.35%	1.53%	1.47%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

As can be seen from Table 1, total defence investment in Germany has been growing steadily and has doubled in the last five years. The same can be said for direct defence spending, although the growth rate is not as intense. As for the percentage of expenditures relative to the country's GDP, there was a slight increase in 2020, although there were no radical jumps in spending.

Accordingly, such an increase in the relative value can only be justified by a decline in GDP itself. There is every reason to believe that in 2020, this economic decline was due to the COVID-19 pandemic, but it did not affect defence spending. France's figures are slightly different from the previous ones. They are shown in detail in Table 2.

Table 2. Key indicators of French defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	40852	42748	44361	46000	47900
Total defence investments, EUR million	9873	10116	10846	12200	13300
Total defence expenditures as a percentage of GDP, %.	1.78%	1.81%	1.82%	2.00%	1.93%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Despite a slightly lower defence budget, France invests more resources in development, which is a positive sign in terms of innovation. In terms of percentage, there was also a slight increase in 2020, with an increase in spending in euros. As for Belgium, its defence spending as a share of GDP has remained almost unchanged over the last two years of data. For more information, see Table 3.

Table 3. Key indicators of Belgium's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	3932	4101	4303	4808	5358
Total defence investments, EUR million	263	424	471	550	920
Total defence expenditures as a percentage of GDP, %.	0.88%	0.89%	0.90%	1.05%	1.06%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

As shown in Table 3, investments in the development of new technologies are growing at a high rate and have increased 3.5 times in the previous 5 years. At the same time, in the case of Belgium, it is also possible to observe an increase in defence spending in 2020 as a percentage of GDP, while the absolute figure is growing, which is a common trend in developed European economies. The analysis of countries in the Southern and Mediterranean region begins with Greece. Its key defence spending indicators are shown in Table 4.

Table 4. Key indicators of Greece's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	4208	4560	4320	4837	6578
Total defence investments, EUR million	485	518	533	535	2542
Total defence expenditures as a percentage of GDP, %.	2.38%	2.54%	2.36%	2.93%	3.60%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Of the data shown in Table 4, the most remarkable is the significant increase in investment in the country's military-industrial complex in 2021 – after several years of almost unchanged levels. In the same year, direct defence spending also increased significantly. Such changes are likely to be due to the intensification of the permanent Aegean conflict between Greece and Turkey, which escalated several times in 2020-2021. As for Italy, its military indicators are shown in Table 5.

Table 5. Key indicators of Italy's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	21166	21702	21143	22844	27365
Total defence investments, EUR million	4378	4152	4235	5618	5969
Total defence expenditures as a percentage of GDP, %.	1.22%	1.23%	1.18%	1.38%	1.54%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

In 2021, there was a significant increase in defence spending compared to previous years, but not a significant one. The situation is somewhat different in Spain, whose key indicators are shown in Table 6.

Table 6. Key indicators of Spain's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	10528	11172	11281	11240	12546
Total defence investments, EUR million	2218	2545	2443	2252	2882
Total defence expenditures as a percentage of GDP, %.	0.91%	0.93%	0.91%	1.00%	1.04%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Based on Table 6, the percentage of GDP spent on defence declined in 2019, before the pandemic. This indicates a certain crisis in the country's economy that occurred during this period, as in absolute terms, defence spending in 2018 and 2019 was almost unchanged. The next block of countries is Eastern Europe, which in the twentieth century was in the orbit of influence of the Soviet Union. Consequently, after the collapse of the Warsaw Pact defence bloc, it was particularly difficult for these countries to transition to the European defence standard. Nevertheless, as can be seen from Table 7, the Czech Republic has managed to accomplish this task.

Table 7. Key indicators of Czech defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	1944	2298	2586	2809	3331
Total defence investments, EUR million	304	302	392	469	667
Total defence expenditures as a percentage of GDP, %.	1.00%	1.09%	1.15%	1.30%	1.39%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Although in absolute terms the Czech Republic still lags behind Old Europe, the percentage of defence spending as a percentage of GDP is at a decent European average. The volume of investment in defence, which has doubled since 2017, is also worth noting. Another former socialist country, Poland, is also successfully integrating into the renewed European defence system, as shown in Table 8.

Table 8. Key indicators of Poland's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	8821	10047	10559	11724	12765
Total defence investments, EUR million	2002	2764	2651	3436	4405
Total defence expenditures as a percentage of GDP, %.	1.89%	2.02%	1.98%	2.23%	2.22%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Particular attention is drawn to the relatively large investments in the defence sector – unlike other countries, they reach up to a third of defence spending in Poland. This is caused by the fact that during the preparation of military aggression against Ukraine in 2021, Poland, as the country closest to the potential theatre of war, was also preparing for defence, which is reflected in the indicators. The last Eastern European country analysed, Hungary, also has its defence integration scenario. It is shown in Table 9.

Table 9. Key indicators of Hungarian defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	1516	1369	1832	2427	2591
Total defence investments, EUR million	282	174	441	1106	963
Total defence expenditures as a percentage of GDP, %.	1.19%	1.01%	1.25%	1.77%	1.68%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

When analysing the data in Table 9, the relatively large investments in the development of the defence industry that took place in the country in the previous two years are the first to catch the eye.

The last block of analysis of the military integration of European countries is the former republics of the USSR (Union of Soviet Socialist Republics), which not only managed to fully join the common European community but also demonstrated their readiness to defend their independence from the revanchism of the aggressor country. The indicators of the Estonian MIC are shown in Table 10.

Table 10. Key indicators of Estonian defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	479	514	556	615	647
Total defence investments, EUR million	95	89	81	156	185
Total defence expenditures as a percentage of GDP, %.	2.01%	1.99%	2.01%	2.29%	2.11%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Comparatively, the euro-denominated figures are offset by Estonia's sufficient attention to future challenges and relatively strong investment in technology and research. The data for Latvia are shown in Table 11 and demonstrate that the percentage of GDP spent on defence has remained almost constant over the years.

Table 11. Key indicators of Latvian defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	430	613	634	651	696
Total defence investments, EUR million	65	192	154	136	204
Total defence expenditures as a percentage of GDP, %.	1.59%	2.10%	2.07%	2.21%	2.12%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

According to Table 11, this Baltic country also pays sufficient attention to security investments – in 2021, the volume of investments in innovation reached more than a third of direct defence spending. The key indicators of Lithuania's military-industrial complex are shown in Table 12.

Table 12. Key indicators of Lithuania's defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	724	895	979	1028	1105
Total defence investments, EUR million	229	331	291	362	248
Total defence expenditures as a percentage of GDP, %.	1.71%	1.97%	2.00%	2.08%	2.00%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

Lithuania's indicators in Table 12 are in line with the trend shared by the other Baltic states, as the proximity to the aggressor country forces them to keep investments in defence research and development at a high level. In general, for the 27 countries of the European Defence Association, the three key indicators of defence industry development over the previous 5 years are as follows (Table 13).

Table 13. Key indicators of EDA defence spending in the period from 2017 to 2021

Year	2017	2018	2019	2020	2021
Total defence spending, EUR million	164431	173516	185943	197785	214309
Total defence investments, EUR million	30601	34303	41441	43991	52247
Total defence expenditures as a percentage of GDP, %.	1.29%	1.31%	1.36%	1.51%	1.52%

Source: compiled by the author based on EDA portal research (Defence data..., 2021)

As can be seen from Table 13, the overall picture is generally in line with the trends of the individual countries studied, which means that military integration in Europe is proceeding smoothly and harmoniously. Considering the defence integration of European countries, it is important to model Ukraine's place in the continent's common security. Table 14 shows the key parameters of the countries under study.

Table 14. Key country indicators for 2021

Country	GDP-2021, million euros	Total defence expenditures in 2021,
million euros	197785	214309
Belgium	425009	6278
Germany	3047462	61781
France	2116000	61200
Italy	1507803	33334
Greece	153715	9120
Spain	1021116	15428
Czech Republic	201577	3998
Poland	486059	17170
Hungary	130090	3554
Lithuania	47533	1353
Latvia	28510	900
Estonia	26606	832

Source: compiled by the author based on EDA (Defence data..., 2021) portal and World Bank (2021) research

To calculate the relationship between these indicators and to model Ukraine's needs, a regression analysis of the data was conducted, the results of which are presented in Table 15. The regression visualisation as a dot plot and a trend line can be seen in Figure 1.

Table 15. Regression statistics

R multiplier	0.96646484
R-square	0.934054288
Normalized R-square	0.927459717
Standard error	6028.289456
Observations	12
Y-intersection	987.4624531
X 1 variable	0.022096383

Source: compiled by the author

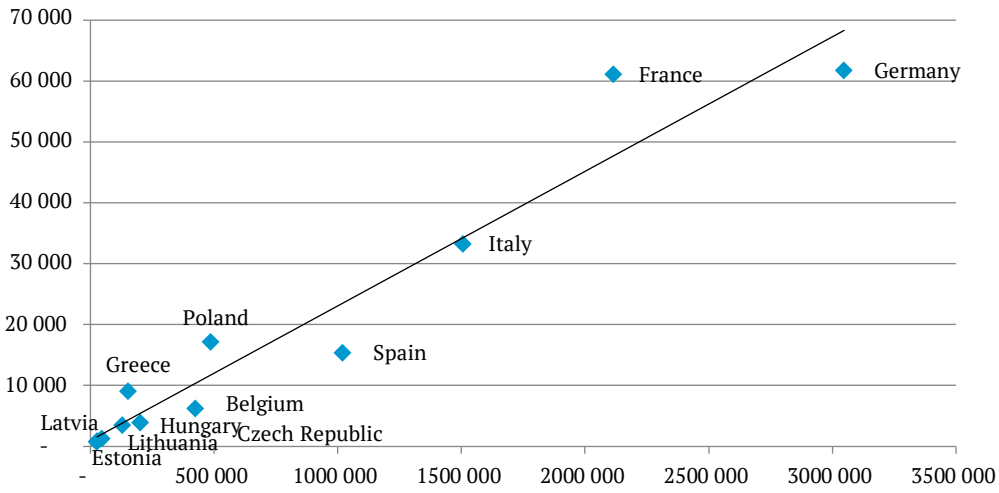

Figure 1. Dependence of defence spending on GDP
Source: compiled by the author based on EDA (Defence data..., 2021) portal and World Bank (2021) research

Based on the data obtained and the analysis of the determination coefficient R^2, which is 0.934, it is possible to assume a strong dependence between the parameters under study. With a certain margin of error, it can also be argued that the relationship between the GDP of European countries and their defence spending is calculated by formula (1):

$$U_m = 987.46 + 0.022 * GDP, \quad (1)$$

where: U_m – the amount of recommended investment in the defence industry, and GDP is the gross domestic product of the state. According to this model, to be in line with the European average, Ukraine's defence spending in 2021 should be (2):

$$U_m = 987.46 + 0.022 * 143279 = 4153 \text{ million euros.} \quad (2)$$

This calculation approach is relevant for peacetime, so it should be used as a benchmark after the victory. For better visualisation, the theoretical model of Ukraine's integration into the European military-industrial complex can be presented in the form of a flowchart (Fig. 2).

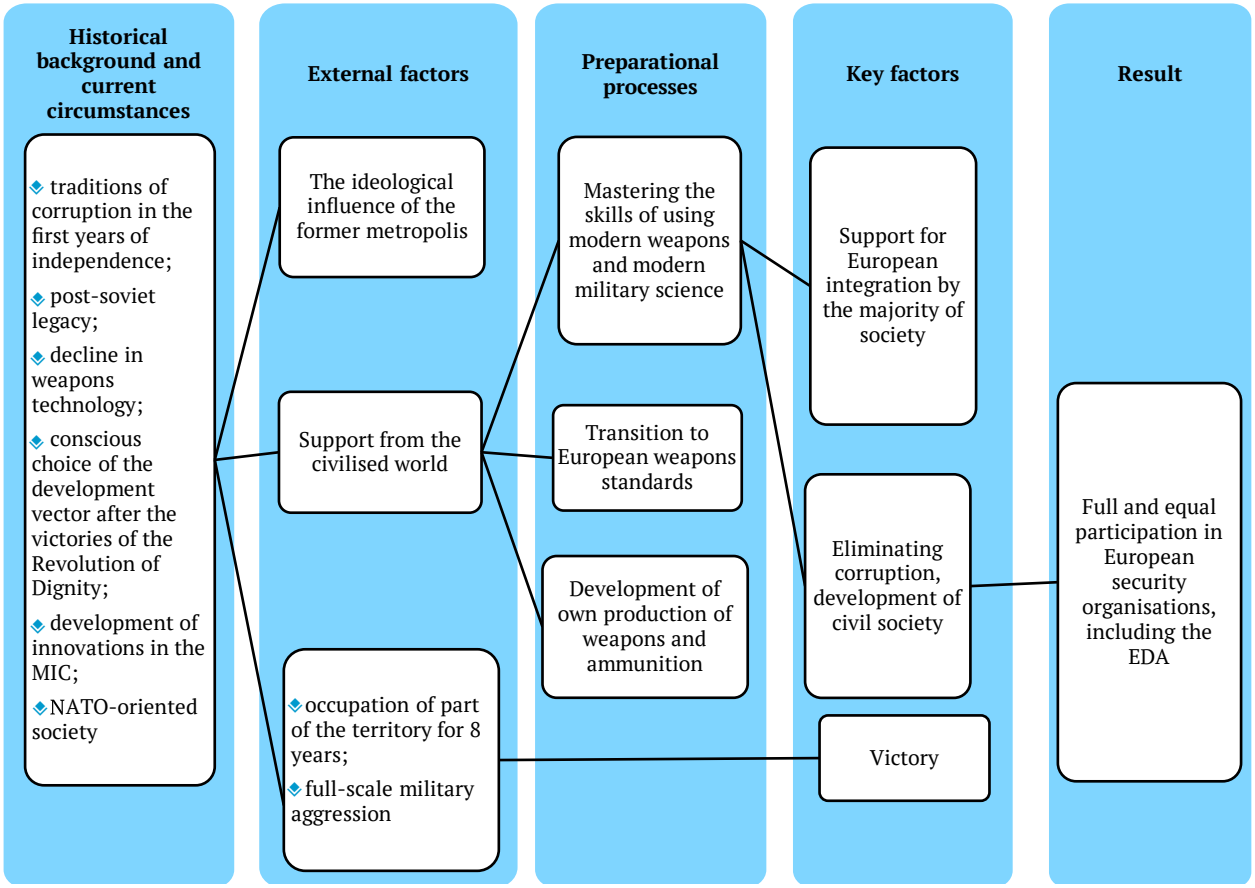

Figure 2. A theoretical model of Ukraine's military integration
Source: compiled by the author

Defence research and development is also an important overall indicator of development and integration. In 2021, the European community allocated more than €3.5 billion to defence research and technology (R&T), a new record. Compared to the historic low of 2016, defence R&D spending has almost tripled. See Figure 3 for more information on the entire period of research.

However, the most telling indicator of the integration of the European defence industry is joint contracts for the purchase of defence equipment. In 2021, this figure reached a powerful €8 billion, as can be seen in Figure 4.

The graph in Figure 4 is highly non-linear, reflecting how a period of interest in joint projects in the mid-2000s gave way to a period of disbelief in the need for a common defence policy in 2013. However, after the russian annexation of Crimea in 2014, the threat became real, and Europe began to prepare for a joint response to the aggressor. This integration has been given a special impetus by the enemy's apparent preparations for aggression in 2021, which is also reflected in the timeline.

An analysis of the dynamics of the EU's defence spending in 2022, after the outbreak of full-scale aggression, could be very revealing, but as of 2023, these figures have not yet been processed and systematised.

Nevertheless, the Annual Report provides general information on the strengthening of the organisation's position in 2022. In particular, it announced a paradigm shift in security and defence in Europe and an increase

in defence spending by member states (EDA annual report, 2022). In total, in 2022, the Agency managed 97 joint special projects and programmes in areas such as research and training with a total estimated value of €672 million. Also in November 2022, Defence Ministers launched a new EDA project, the Military Computer Emergency Response Network (MICNET), which will significantly enhance EU defence cooperation in cyberspace. Another important event in terms of European defence integration was the strengthening of the coordination of the Defence Joint Procurement Task Force project, which is responsible for the rapid replenishment of weapons stocks, including for Ukraine (European defence in..., 2023).

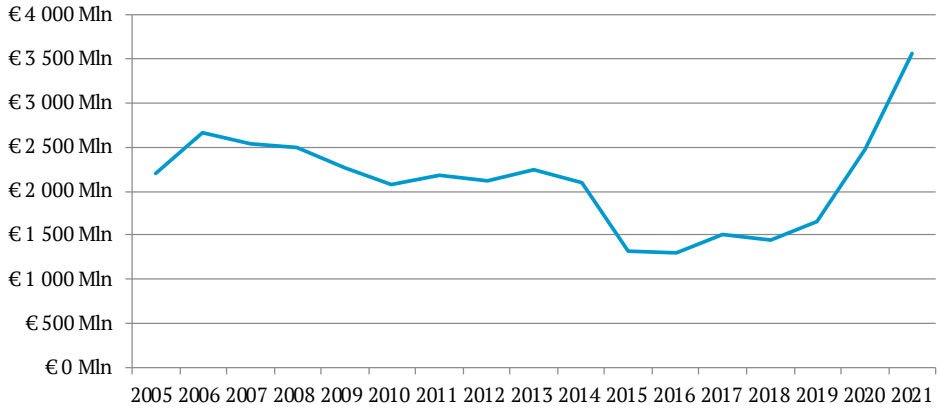

Figure 3. Total spending by EDA member countries on defence research and technology
Source: compiled by the author based on EDA portal research (Defence data..., 2021)

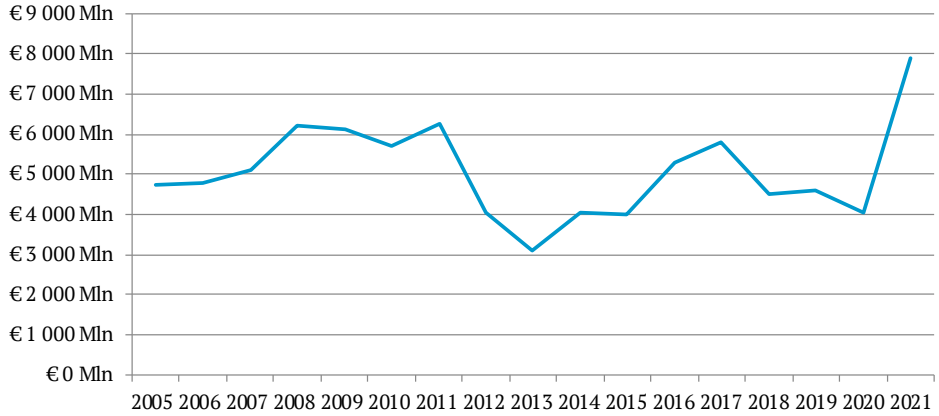

Figure 4. Budgets of joint EU contracts for the purchase of military products
Source: compiled by the author based on EDA portal research (Defence data..., 2021)

In addition to purely military and defence measures, economic diplomacy plays an important role in the integration of countries, as it helps to find a compromise faster and preserve the financial interests of the parties to the maximum extent possible. It is through economic diplomacy that states manage to make foreign markets more receptive to their products and reduce the influence of competitors.

At the same time, such diplomacy has another aspect: if a member of the community violates the rules of peaceful coexistence, it is possible to activate sanctions mechanisms and deprive the aggressor of certain goods or technologies. In particular, since the beginning of full-scale military operations by russia, 11 packages of economic sanctions have been applied to the aggressor country in the banking, defence, energy sectors, etc. In addition to sectoral restrictions, sanctions were imposed on specific companies and organisations.

Along with such a powerful lever as economic diplomacy, it is worth considering the impact of economic security. In general, economic security is a guarantee of the existence of economic sovereignty and national security of a country, as well as a guarantee of sustainable development of citizens, but in the context of military aggression, this concept takes on more fundamental features. While economic security is manifested in the form of an embargo concerning the aggressor country, for partner countries, on the contrary, it is a source of additional integration processes. In particular, on 1 October 2022, Ukraine joined the NCTS Common European Transit

Regime (the so-called "customs visa-free regime"), which greatly simplifies the transport of goods on the continent and works on the principle of one transport – one declaration – one guarantee. According to the official portal of the Ministry of Finance of Ukraine ("Customs visa-free"..., 2023), 4474 declarations were issued under this project in just 7 months, including 3276 for departure from Ukraine and 1198 for receipt by Ukraine. Another dimension of European defence and industrial integration is military assistance to Ukraine, especially after the start of the large-scale invasion in February 2022. This assistance should be viewed in two ways: a) financing the Ukrainian defence industry and providing it with funds to purchase weapons and ammunition from private entities, and b) centralised in-kind transfers of weapons and military equipment on behalf of states. The total military and financial assistance to Ukraine from European countries in the period from January 2022 to February 2023 is shown in Table 16.

Table 16. Total military and financial assistance to Ukraine from European countries

Country	Financial assistance, billion euros	Military assistance, billion euros	Total, billion euros
Germany	1.30	3.57	4.87
Poland	0.93	2.42	3.36
Great Britain	2.94	6.63	0.58
Netherlands	0.99	2.36	3.35
Czech Republic	-	0.57	0.57
France	0.70	0.65	1.35
Spain	0.35	0.32	0.67
Norway	0.96	1.26	2.22
Italy	0.31	0.66	0.97
Sweden	0.17	1.13	1.30
Austria	0.04	-	0.04
Switzerland	0.06	-	0.06
Denmark	0.06	0.80	0.86
Romania	-	-	0.00
Belgium	0.01	0.24	0.25
Finland	0.08	0.77	0.85
Bulgaria	-	0.24	0.24
Slovakia	-	0.21	0.21
Lithuania	0.02	0.41	0.43
Portugal	0.25	0.07	0.32
Ireland	0.03	-	0.03
Latvia	0.02	0.37	0.39
Estonia	-	0.31	0.31
Greece	-	0.19	0.19
Croatia	-	0.12	0.12
Luxemburg	-	0.09	0.09
Slovenia	-	0.06	0.06
Total	9.23	23.45	32.68

Source: compiled by the author based on Kiel Institute of World Economics portal data (Ukraine support tracker, 2023)

To better understand the contribution of each partner to the common security on the continent through military support to Ukraine, two separate line charts were created – one for financial (Fig. 5) and one for military (Fig. 6) assistance. The sequence of countries was ranked according to the absolute amount of their contributions.

According to the graph above, the leading donors of military aid to Ukraine are the United Kingdom and Germany, while the contribution of, for example, Lithuania and Latvia is almost invisible. However, such an assessment is not completely objective, as the size of the economy of the country that shares the aid should also be considered. Accordingly, Figure 7 shows the ranking of countries by the share of their GDP that they were able to help Ukraine defend itself against the aggressor country of Russia.

After analysing the available data, it appears that the contribution of the Baltic states is much greater than it seems at first glance, as they have donated about one per cent of their GDP to Ukraine's defence. Even though these amounts are not very large in absolute terms compared to such giants of the European economy as Germany and the UK, the Baltic states' assistance should be valued the most, as their investment in the security of their neighbouring country is almost identical to the cost of defending their own country.

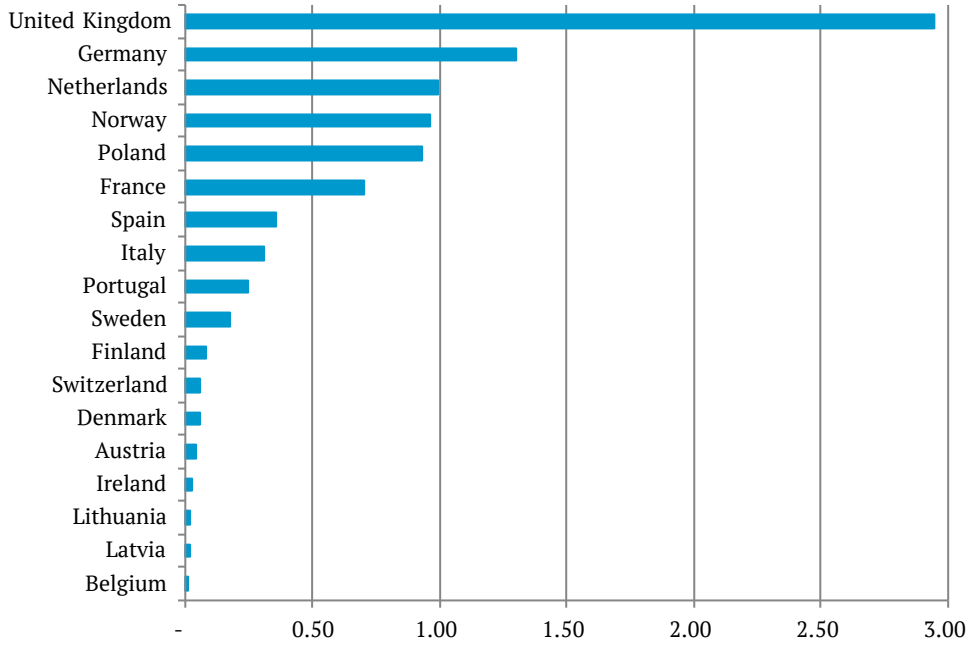

Figure 5. Financial assistance from European countries for Ukraine's military needs, billion euros
Source: compiled by the author based on Kiel Institute of World Economics portal data (Ukraine support tracker, 2023)

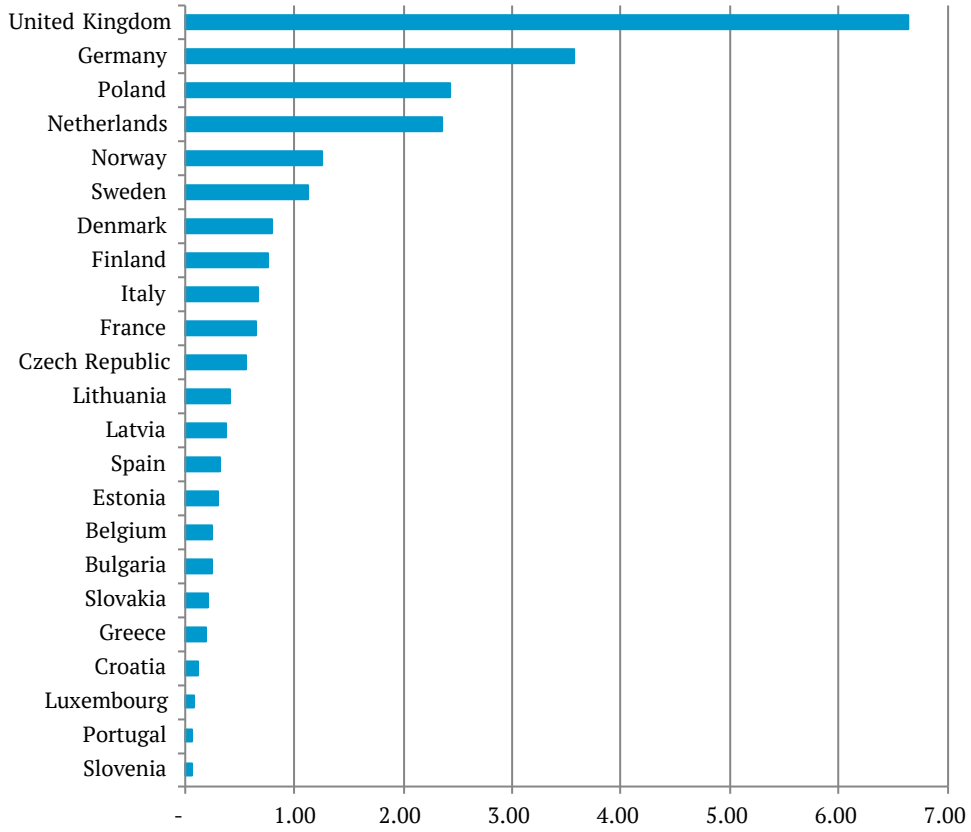

Figure 6. European military assistance to Ukraine with weapons and equipment, billion euros
Source: compiled by the author based on Kiel Institute of World Economics portal data (Ukraine support tracker, 2023)

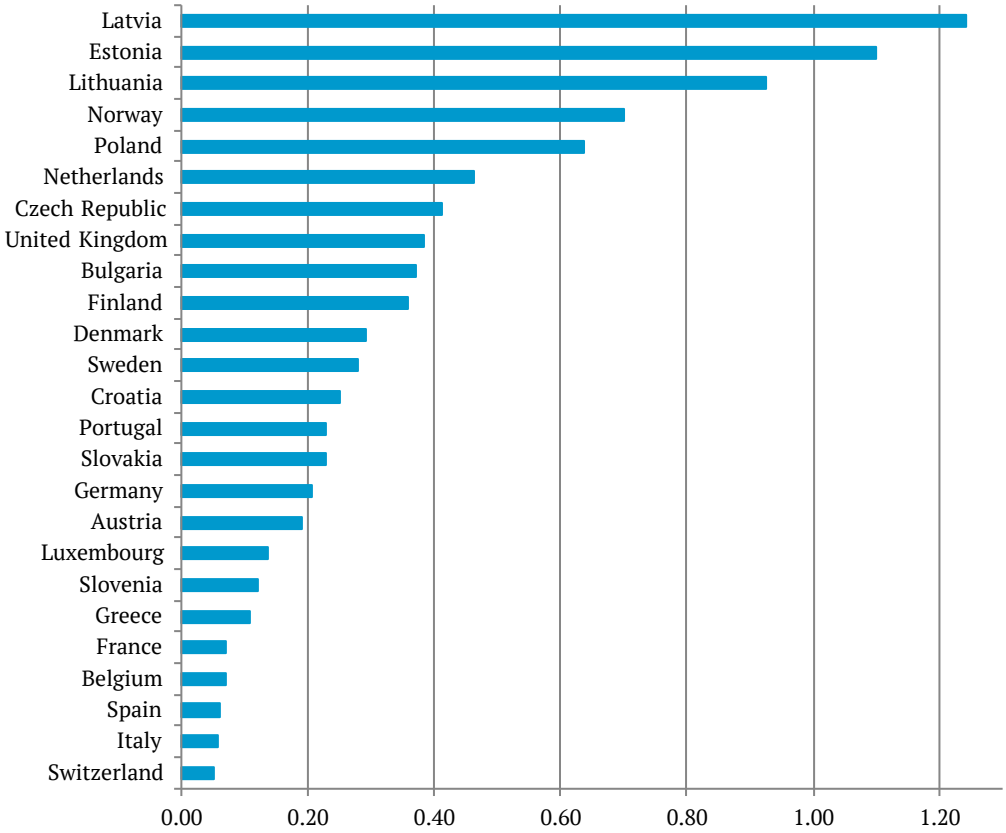

Figure 7. Military aid to Ukraine from European countries, % of GDP
Source: compiled by the author based on Kiel Institute of World Economics portal data (Ukraine support tracker, 2023)

Thus, the integration of the military complexes of European countries – at the level of technology, standards, and knowledge exchange - is quite high. The armed aggression against Ukraine gave an additional impetus to this integration, forcing the EU to unite more closely in the face of a common challenge.

It is worth mentioning an additional advantage of joint continental defence, such as the standardisation of weapons. Although many developed countries in Europe have their production of, for example, tanks, the many years of joint work on security policy have led to the fact that all major tank models have a single and interchangeable standard of shells, which means that different national defence industries can produce them in the same format without fear of logistical problems. In practice, this has helped Ukraine, while receiving assistance from different countries, not to be distracted by additional control over the flow of equipment and ammunition.

Discussion

When analysing the results of this study, it is worth paying attention to previous works on assessing the integration of the European military-industrial complex, as this issue has been studied before. According to the observations of B. Martins & J. Mawdsley (2021), back in the 1970s, the continent developed a common view of collective security, which, on the one hand, was driven by transatlantic military competition with the United States, and on the other hand, was a guarantor of innovation in the civilian sphere. This idea was translated into a project of the European Defence Fund (EDF) in 2017, which manages joint defence-industrial projects and supports military research in the EU in an autonomous manner. Accordingly, the authors argued that independent technologies and innovations play a key role in the EU's vision of its secure future, which was reflected in such 2020 documents as the updated cybersecurity strategy and the EU digitalisation strategy.

In 2020, J. Shea (2020), analysing Brexit in terms of changing security balances, stressed that it is in the pragmatic mutual interest of the EU and the UK to find ways to continue working together in the field of security and defence, as the UK's exit from the EU in 2020 looked like an institutional crisis and a blow to collective security. However, as demonstrated in this paper, such a "split", on the contrary, has led to increased security for the UK, its neighbours, and Ukraine, as the UK has lost its obligations to coordinate its actions collectively and gained greater manoeuvrability and independence, including in terms of transferring its weapons to other countries.

With the outbreak of full-scale military aggression against Ukraine on 24 February 2022, theoretical issues of military integration within Europe received a new impetus and moved into the practical plane. P. Genschel *et al.* (2023) examined the EU's institutional development through the prism of the outbreak of war and identified two main conditions for military integration: the "functional"

condition refers to increasing the efficiency of centralisation (no federation without functional benefits), and the "political" condition refers to the forced alignment of interests and identities (no federation without public support). After assessing the realities of the first months of the war in Ukraine, they concluded that a temporary "stress" decentralisation of the European military alliance was necessary.

A similar dynamic of public opinion reactions to the invasion – from despair at the beginning to confidence over time – was noted by O. Fernández *et al.* (2023), who examined the sentiments of news sources, reflecting the widely accepted link between media coverage and public opinion. The authors conclude that the EU's contributions to security and defence are increasingly perceived favourably by the public and suggest that "mass politicisation" in this area could improve the prospects for European defence integration. Another indicator of the "initial shock" caused by the attack on Ukraine in 2022 is a survey conducted among EU students by N. Steiner *et al.* (2023). It was a coincidence that the research team received some of the respondents' answers before 22 February, and the rest shortly after. After analysing the answers to the same questions regarding deeper integration within the EU, the authors came up with a clear result: the outbreak of war in Europe increased students' interest in EU policies and strengthened their commitment to common values. A similar surge in awareness and rethinking in the spring of 2022, but on the part of institutions, was identified in the current study.

A crisis of this magnitude, such as military aggression, affected not only citizens but also the political elite of European countries. Germany, which had been pursuing an emphatically inactive military policy after the Second World War, was forced to break the usual order. V. Handl *et al.* (2023) studied the impact of Chancellor O. Scholz's declaration of full-scale war a few days after the outbreak of the war and found that Germany was ready to take a leading role in the defence of Europe, despite its guilt complex. The increase in military assistance noted in the current paper is a confirmation of the new Zeitenwende policy and a significant contribution to the military integration of the continent.

O. Ditrych & T. Kucera (2022) also devoted their study to the general situation with the balance of power in Europe and the world. Their analysis shows that economic rather than political factors remain the key driver of defence integration, as traced by social network analysis (SNA), and for a long time, before the emergence of formal institutions, they ensured European military balances.

The topic of economic sanctions against the aggressor, mentioned in this study, was also studied by A. Gaur *et al.* (2023). Their conclusion at this stage is the lack of effectiveness and the need for greater control over sanctions circumvention. Another topic that was investigated in this paper in the context of economic integration - "customs visa-free travel" - was studied by D.T. Ünal (2023). Having analysed the effect of the introduction of electronic customs using the method of fuzzy analytical hierarchy, he concluded that the most important factor in the NCTS system is the time factor.

Discussing European security, NATO cannot be ignored, as the North Atlantic Alliance is the most powerful defence bloc in the world. Accordingly, European policymakers need to constantly maintain a balance between pursuing their interests and working together as a team with the defence industries of the United States, Canada, and Turkey. L. Ratti and A. Leonardi (2023) traced the relationship between NATO and European defence cooperation from the end of World War II to the beginning of the war in Ukraine and noted that while Western European defence initiatives during the Cold War were aimed at securing US support, in the twenty-first century the Alliance began to lose its role. Paradoxically, it was the war in Ukraine that drove NATO's expansion and strengthening. The expansion of the defence capabilities of European countries, which has been documented in this paper, also illustrates this observation.

At the same time, the impact on a country after joining NATO is not only in the military sphere - according to A. Mayberry (2022), even obtaining a Membership Action Plan (MAP) has a positive impact on the country's economic situation. Bypassing the methodological difficulties caused by the heterogeneity of countries, the author proved that in each of the NATO countries, without North Atlantic defence integration, per capita income would be, on average, about 15% lower than it is now. Given the prospects of Ukraine's membership, which follows from the results of this paper, this statement is a relevant additional argument.

R. Alcaro (2022) suggests considering the current crisis in European security from the perspective of new opportunities. After analysing the state of EU defence integration and how supranational and intergovernmental institutions have responded to the current crisis, the author concludes that EU countries have received an additional incentive to further military and economic integration to jointly counter the economic consequences of the war, finance Ukraine's reconstruction and support the enlargement process.

However, the war in Ukraine is still ongoing and the future of the continent remains unpredictable. The more casualties the aggressor suffers on the battlefield, the more conventional weapons it loses, and the more often concerns are raised about the use of nuclear weapons in Europe. Having examined this possibility, A. Bollfrass & S. Herzog (2022), M. Smetana & M. Onderco (2023) state that a hypothetical victory of the aggressor would advertise the coercive power of nuclear weapons and the vulnerability of non-nuclear-weapon states, which would significantly affect military integration within the EU. Accordingly, the strengthening of integration processes reflected in the results of this paper aimed at preventing the aggressor's victory gains additional motivation.

Conclusions

The idea of a united Europe, known since the Middle Ages, is being finalised in the twenty-first century with the creation of the EU as a new full-fledged subject of international relations. Although with the development of technology, each country and each nation have more opportunities

to exist autonomously, only by combining their efforts and resources, using the mental characteristics of different peoples, will the European continent be able to achieve sustainable development. A special aspect of such an association is common security. This study has shown that each European country makes its contribution to the development of a common defence system.

Every year not only are the overall budgets for military needs increasing but also investments in the development of innovative products that also strengthen common European security. Another important indicator of military integration is the volume of contracts concluded jointly by the Ministries of Defence. In 2021, it reached a record high, almost tripling the value of 2013.

Back in the early 2000s, new armed aggression on the continent was considered impossible, and the activities of European defence structures became more formal over the years, with budgeting for these needs based on the final principle. However, the annexation of territories in the heart of Europe in 2014 demonstrated the reality of war, and before the outbreak of full-scale aggression in 2022, the European Defence Agency managed to regain its potential and strengthen the military integration of its member states.

Another marker of the increased interaction of European defence complexes is assistance to Ukraine. This study has provided convincing evidence of strong support, both in terms of financing military needs and in terms of the transfer of modern weapons, equipment, and ammunition.

It would be even more informative to understand the coordination of military assistance to Ukraine between Europe, the United States and Canada. Such a study could form the basis for further work on military integration.

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Conflict of Interest

None.

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Сучасні тенденції військово-промислової інтеграції країн ЄС та наслідки для України

Анотація. У час спільних безпекових викликів, для усього європейського континенту найактуальнішим постає питання захисту цивілізованих країн від зовнішньої військової агресії. Мета роботи – проаналізувати існуючі інтеграційні процеси в Європі та екстраполювати їх на військово-промисловий комплекс України, оскільки саме вона зараз є аванпостом Євросоюзу, де використовується весь спектр сучасних військових технологій. Завданнями дослідження, у свою чергу, є визначення тенденцій, що відбувались у військовій промисловості передових країн Європи, та оцінка перспектив їх подальшої інтеграції у контексті наявної зовнішньої військової агресії. За допомогою методів статистичного та регресивного аналізу, а також лонгітюдного метода були зібрані та проаналізовані ключові показники. У процесі дослідження були отримані результати щодо розвитку оборонних витрат окремих країн, дані щодо участі країн ЄС у спільних проектах, обсяг санкцій, застосованих до країни-агресора, показники участі України у спільному митному просторі, а також обсяги військової допомоги від країн-партнерів. Аналіз отриманих даних привів до висновків про суттєве покращення обороноздатності як України, так і усього Європейського Союзу. Також було виявлено, що заміна застарілих радянських стандартів на сучасні західні призвели до суттєвого збільшення оборонного потенціалу. Крім того, у процесі дослідження вдалося з'ясувати, що невиправдана збройна агресія проти України зміцнила відносини і між країнами Європейського оборонного агентства та дала їм поштовх щодо розвитку колективних оборонних спроможностей та укладення спільних угод за участю військово-промислових комплексів. З практичної точки зору, отримані індикатори змін на континенті дали змогу зробити висновки щодо напрямків подальшої інтеграції, а також виправити виявлені недоліки

Ключові слова: зброя; війна; стандарти озброєння; переоснащення; оборонні технології; безпекова стратегія