

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SUMY STATE UNIVERSITY

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MASTER'S LEVEL QUALIFICATION PAPER

on the topic "UKRAINE'S INTEGRATION INTO THE WORLD ARMS MARKET"

Specialty 292 "International Economic Relations"

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It is submitted for the Master's level degree requirements fulfillment.

Master's level degree qualification paper contains the results of own research. The use of the ideas, results and texts of other authors has a link to the corresponding source

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Sumy, 2021

SUMMARY

of Master's level degree qualification paper on the theme
“UKRAINE'S INTEGRATION INTO THE WORLD ARMS MARKET”

student Tetiana Makarenko

(full name)

The main content of the master's level degree qualification paper is set out on 61 pages, including a list of used sources of 70 titles, which is placed on 9 pages. The work contains 8 tables, 19 figures, as well as 2 applications, which are placed on 6 pages.

KEYWORDS: WORLD ARMS MARKET, MILITARY EQUIPMENT, EXPORT POTENTIAL, ARMS IMPORTS, DEFENSE-INDUSTRIAL COMPLEX

The purpose of the master's level degree qualification paper is to assess the prospects of Ukraine's integration into the world arms market and formulate proposals for the realization and development of the potential of Ukraine's defense-industrial complex to provide both its own armed forces and achieve the highest possible level of arms exports.

The object of the study is integration processes of the state to the international arms market.

The subject of the study is relations arising between the stakeholders of the defense-industrial complex in the system of the international arms market.

To achieve the set goal and objectives the following scientific research methods were used: comparative analysis (in determining the leaders of the world arms market), expert assessment (in determining the indicators of financing the defense sector of Ukraine), monitoring (in determining the problematic issues of arms imports to Ukraine), literature study (analysis of recent research and publications), systematization and generalization (in determining the role of joint projects in the development of the defense industry).

The information base of the master's level degree qualification paper is statistical information, publications in world and Ukrainian mass media, various charts and diagrams, electronic resources, scientific papers of domestic and foreign scientists.

The main scientific results of the work are as follows:

1) offers to rise the potential of the defense-industrial complex to meet the needs of the Armed Forces of Ukraine and increase the country's export potential through the introduction of offset agreements when importing military equipment and joint projects in the production of weapons;

2) proposals on organizational and economic support of optimization of the structure of the Armed Forces of Ukraine.

The obtained results can be used by the relevant public authorities when forming the strategy of development of the defense-industrial complex of Ukraine.

The results of the approbation of the main provisions of the master's level degree qualification paper were considered at:

1) All-Ukrainian competition of student research papers on the specialization "International Trade" in the 2020-2021 academic year (second place in the second round, April 23, 2021, Kharkiv. Theme of scientific work – "International Arms Trade")

Year of Master's level qualification paper fulfillment is 2021

Year of Master's level paper defense is 2021

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

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“ ___ ” _____ 2021.

TASKS FOR MASTER'S LEVEL DEGREE QUALIFICATION PAPER

(specialty 292 “International Economic Relations”)

student II course, group ME.m-01a.an

(course number)

(group's code)

Tetiana Makarenko

(student's full name)

1. The theme of the paper is “Ukraine’s integration into the world arms market” approved by the order of the university from “ ___ ” _____ 20 ___ №___
2. The term of completed paper submission by the student is 13 December 2021.
3. The purpose of the qualification paper is assessing the prospects of Ukraine’s integration into the world arms market and formulate proposals for the realization and development of the potential of Ukraine’s defense-industrial complex to provide both its own armed forces and achieve the highest possible level of arms exports.
4. The object of the research is integration processes of the state to the international arms market.

5. The subject of research is relations arising between the stakeholders of the defense-industrial complex in the system of the international arms market.

6. The qualification paper is carried out on materials: expert information; specialized literature and publications in the media.

7. Approximate master's level degree qualification paper plan, terms for submitting chapters to the research advisor and the content of tasks for the accomplished purpose is as follows:

Chapter 1 Analysis of the world arms market

Date of submission: 19 November 2021

(title, the deadline for submission)

Chapter 1 deals with: to determine the state and trends of the world arms market.

(the content of concrete tasks to the section to be performed by the student)

Chapter 2 Defense-industrial complex and the armed forces of Ukraine. State and prospects

Date of submission: 03 December 2021

(title, the deadline for submission)

Chapter 2 deals with: to analyze the state of the Ukrainian defense-industrial complex and its prospects on world markets; to outline the needs and identify problematic issues of the Ukrainian army.

(the content of concrete tasks to the chapter to be performed by the student)

Chapter 3 Integration of Ukraine into the world arms market

Date of submission: 10 December 2021

(title, the deadline for submission)

Chapter 3 deals with: to study the economic indicators of arms exports and imports; to determine Ukraine's place in the international arms market before the beginning of the hybrid war, nowadays and in the future.

(the content of concrete tasks to the chapter to be performed by the student)

8. Supervision on work:

Chapter	Full name and position of the advisor	Date, signature	
		task issued by	task accepted by
1	Professor, Doctor of Economics Fedir Zhuravka		
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9. Date of issue of the task: “ ___ ” _____ 2021

Research Advisor: _____ Fedir Zhuravka
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The tasks has been received: _____ Tetiana Makarenko
 (signature) (full name)

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INTRODUCTION

Justification of the choice of topic and its relevance. The conflict in eastern Ukraine has highlighted the need for accelerated modernization of the armed forces and strengthening the country's defense capabilities.

Ensuring such modernization should take place by the forces of the domestic defense-industrial complex (DIC), which should produce a wide range of weapons and military equipment, perform modernization and to provide repair of military equipment. Part of the army's needs, which cannot be met by its own industry, must be imported.

The supply of the army should be carried out on a competitive basis, of course giving preference to domestic producers, but only if the appropriate quality and competitive value of weapons and military equipment are ensured in comparison with imported samples. One of the ways to reduce the cost of production of the domestic DIC is the export of weapons, especially since the production capacity of the domestic DIC, as a rule, exceeds the needs of the Armed Forces of Ukraine. Degradation, and sometimes the collapse of the domestic DIC, which took place before 2014, as well as the needs of own armed forces, which increased significantly with the beginning of the hybrid conflict, led to the displacement of Ukraine from the top ten world leaders in arms exports. Thus, following the results of 2020, our state took only the twelfth place in the corresponding rating, by 2021 we forecast a more optimistic picture, and this is much lower than the indicators that Ukraine should claim. Therefore, the issues of realization of the export potential of the DIC, taking into account its development and technological growth, are relevant. To do this, it is necessary to understand not only conjunctural, but also qualitative structural and technological changes in the international arms market. It is important to determine the correct vector of development of the Ukrainian DIC, to achieve the highest possible positions in the world market, its weaknesses and prospects.

Ukraine has lagged behind the world's leading countries in terms of technology for decades, most of the weapons produced by the domestic DIC are the developments of the 70-80s of last century, at best, in some way upgraded with the improvement of some characteristics.

In this perspective, it is important to have access to modern weapons, both in the form of assistance from partner countries and the possibility of their free systematic procurement without any restrictions, which in some ways, of course, does not suit the aggressor state, which uses any opportunities to address this issue in their favor. It would seem that it is not such a difficult issue, having the funds (although not all is well with it), to import military products selected according to the optimal indicators, but not in our case. Politicians in many countries around the world are trying to distance themselves from Ukraine's problems, considering the armed conflict in Ukraine not a war but a civil confrontation.

Thus, full-scale integration of Ukraine into the world arms market is perhaps the most important task of the government and politicians today. Of course, many efforts of the Ukrainian authorities are focused on solving this problem, but in such a complex issue it is necessary to weigh all possible directions of movement, because at stake (given the enemy group at the borders), neither much nor little - the fate of the state.

Analysis of relevant studies and publications. Ukraine inherited a third of its military-industrial complex from the USSR, so the issues of realizing the capabilities of the DIC and its export orientation, have always received considerable attention. These issues are explored in the works of: Alexandrov O., Badrak V., Begma V., Burenko V., Gorbulin V., Dubov D., Zinyak L., Kornievsky O., Kulitsky S., Polyakov S., Rykhtyuk V., Sazonets I., Salnikova O., Svengurov O., Sungurovsky M., Sukhorukov A., Shevtsov A. and others. However, recently, when the negative moments that took place in the military sector became known to the public, the attention has increased even more. The state of the DIC turned out to be unsatisfactory and indicates the need for

radical changes in this area. This is directly related to the realization of export potential, as Ukraine needs a significant improvement in its position on the world arms market.

Matyushenko I. and Kovalchuk K. emphasize the need for research on the world arms market to increase the prospects for the integration of Ukraine's military-industrial complex into international structures [1].

Sungurovsky M. ten years ago drew attention to the growing role of quality parameters of the armed forces, technological modernization of armies, and oversaturation of the world arms market [2].

The requirement of more thorough consideration of qualitative changes in the world arms market is discussed in the works of Salnikova O. and Sytnyk G., who insist on the inexpediency of producing a complete list of major weapons, study the development trends of the DIC of the world's leading countries, which must be taken into account for the maximum realization of export potential [3].

Begma V. and Sklyar N. emphasize the extremely low speed of Ukraine's response to conjunctural and strategic changes in the world arms market [4].

There are also foreign researchers whose works are devoted to the study of the world arms market: Feinstein A., Johnson R. A. I., Freeman S. P., Tan A. T. H., Stohl R., Grillot S., Holden P., Anwar D. F., Eide E. B., Kumar R., Caparini M., Cobar J. A., Melvin N., Smith T., Tian N., Flora O., Bromley M., Landzos P., Bulanin V., Verbruchen M., Bauer S., Wezeman P. D., Kuimova A., Wezeman S. T. and others.

Feinstein A. investigates the shadow world of global arms trade and opens the eyes of the world to its behind-the-scenes history [5].

Stohl R. and Grillot S. pay attention to world leaders in arms exports and imports, arms dealers, as well as gray and black trade schemes [6].

Tan A. T. H. created a standard guide to the international arms market, saturated with statistical information. He pays considerable attention to the modernization of weapons after the Cold War and the demand for weapons, defense spending, procurement and modernization of military equipment [7].

Aim of the study: assessing the prospects of Ukraine's integration into the world arms market and formulate proposals for the realization and development of the potential of Ukraine's defense-industrial complex to provide both its own armed forces and achieve the highest possible level of arms exports.

In accordance with the aim of the work, the following tasks were set:

- to determine the state and trends of the world arms market;
- to analyze the state of the Ukrainian defense-industrial complex and its prospects on world markets;
- to outline the needs and identify problematic issues of the Ukrainian army;
- to study the economic indicators of arms exports and imports;
- to determine Ukraine's place in the international arms market before the beginning of the hybrid war, nowadays and in the future.

Object of study: integration processes of the state to the international arms market.

Subject of study: relations arising between the stakeholders of the defense-industrial complex in the system of the international arms market.

To achieve the set goal and objectives the following general scientific research methods were used: comparative analysis (in determining the leaders of the world arms market), expert assessment (in determining the indicators of financing the defense sector of Ukraine), monitoring (in determining the problematic issues of arms imports to Ukraine), literature study (analysis of recent research and publications), systematization and generalization (in determining the role of joint projects in the development of the defense industry).

Information base of research: statistical information, publications in world and Ukrainian mass media, various charts and diagrams, electronic resources, scientific papers of domestic and foreign scientists.

Practical significance of the obtained results. The obtained results can be used by the relevant public authorities when forming the strategy of development of the defense-industrial complex of Ukraine.

Approbation of research results. The results of the approbation of the main provisions of the master's level degree qualification paper were considered at:

- 1) All-Ukrainian competition of student research papers on the specialization "International Trade" in the 2020-2021 academic year (second place in the second round, April 23, 2021, Kharkiv. Theme of scientific work – "International Arms Trade")

1 ANALYSIS OF THE WORLD ARMS MARKET

1.1 The modern world arms market

The manufacture and trade in weapons have been developed all over the world since ancient times. The modern world arms market is a very specific sector of relations, the parameters of which are determined by a set of geopolitical, economic and technological indicators. Global confrontations, the creation and disintegration of military-political and economic alliances, political instability, growing military tensions, and armed conflicts all lead to militarization and an increase in the demand for armaments [8].

It would seem that in the 21st century, in the age of digital technologies and the global Internet, humanity should come to its senses, learn to live in peace. But limited resources, the struggle for limited markets for own goods are factors that again and again stimulate confrontation. In the last ten years alone, we have witnessed conflicts in the Middle East and Africa, and the constant growth of instability on the Korean Peninsula and Venezuela, in Ukraine and Belarus. Therefore, the demand for weapons and military technology is constantly growing, and accordingly the attention to the development and study of the world arms market [9; 10].

In addition to the actual purchase and sale, the international arms market covers the licensed production, leasing and free transfer of weapons in the framework of military assistance to states, international organizations and armed non-governmental groups. All these processes are integrated into the term “arms transfer” [8]. Besides, the arms trade is not always a purely economic gain, the drivers of this process are geopolitical, economic, political or strategic interests [11; 12].

The sale of weapons on the world market has certain limitations, which are reflected in the nature of modern geoeconomic and geopolitical relations between individual countries or intergovernmental associations:

- ecological limits of growth of production, use and utilization of the weapon;
- uneven provision of weapons to individual countries and regions;
- technical and financial impossibility of dimensionless increase in production and utilization of weapons;
- the presence of different economic and political goals of individual countries or military-political blocs;
- energy and resource intensity of weapons production [7; 9].

Military and political tensions due to economic competition for resources and markets on the world stage leads to an increase in the number of military conflicts that occurred in 39 countries in 2020 alone, as shown on fig. 1.1 below, which is 5 more than in 2019 [9; 13; 14].

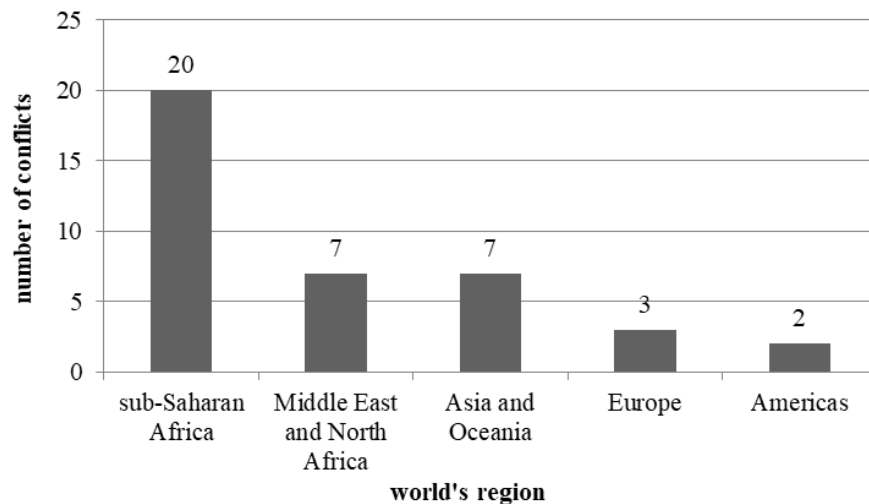


Figure 1.1 - The number of military conflicts in 2020 by regions of the world [14]

Figure 1.1 shows that the largest number of military conflicts (20) in 2020 took place in sub-Saharan Africa. This level of tension has led to an increase in global military spending over the past 15 years from 1,466 trillion USD in 2005 to 1,981 trillion USD in 2020, as shown on figure 1.2 [15].

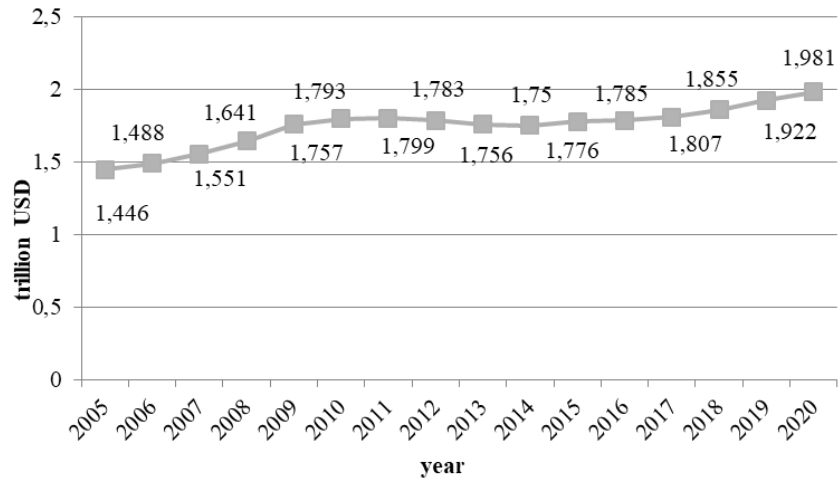


Figure 1.2 – Military expenditures in the world in trillion USD (2005-2020 years)
[15]

Despite the COVID-19 pandemic, the deteriorating situation in many markets, the trend of increasing military spending in the world has continued. At the same time, the share of GDP allocated by countries for defense also has an upward trend. If in 2019 this figure averaged 2,19%, in 2020 it was already 2,35%, as shown on the figure 1.3 below [16]. This can be explained by the fact that due to the effects of the pandemic, the GDP of most countries in the world has decreased, but this has not affected the desire to increase their own military arsenal [17; 18].

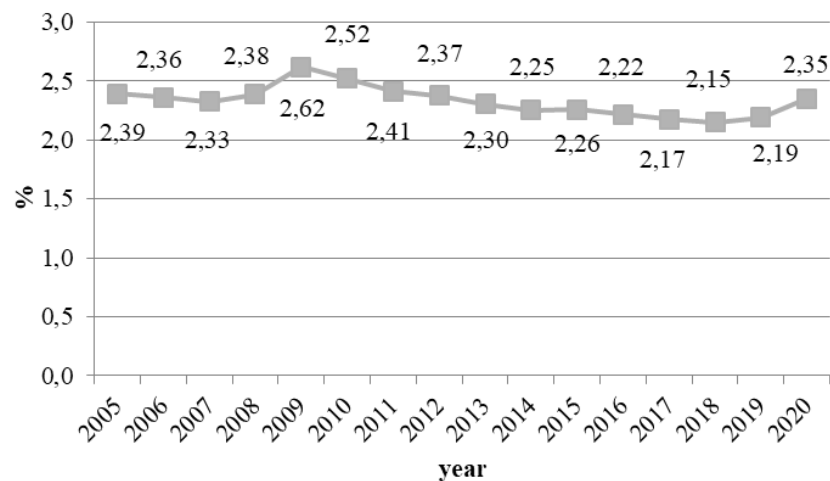


Figure 1.3 - Military expenditure (% of GDP) in the world (2005-2020 years) [16]

From figure 1.4 below, we can see that in 2020, the country with the highest military spending, as always, is a strategic partner of Ukraine - the United States (39% of world military spending) [19]. The main volume of expenditures on the international arms market falls on economically developed democracies, the strategic strengthening of which gives hope as for further strengthening of international security and growth of stability in economic markets, as for the possibility of ensuring the sovereignty and territorial integrity of Ukraine through political pressure on the aggressor state. At the same time, the growing military power of countries with authoritarian and totalitarian regimes (Russia, North Korea) is provoking chaos in the world economy and international politics. China's significant military spending, in my opinion, is also not a positive signal given the persistent resource shortages in this country [9].

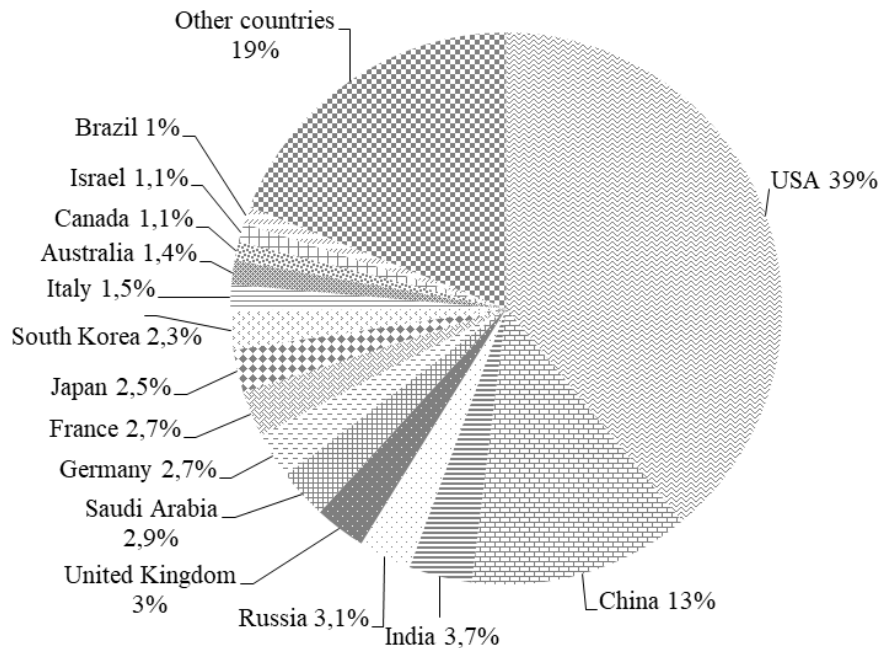


Figure 1.4 - Distribution of military spending worldwide in 2020, by country [19]

In 2020, 1,603 trillion USD, or more than 80% of all allocations, falls on 15 countries. The top five are the United States (778 billion USD), China (252 billion

USD), India (72,9 billion USD), Russia (nearly \$ 61,7 billion USD), and the United Kingdom (nearly 59,2 billion USD), as shown on figure 1.5 [17; 20].

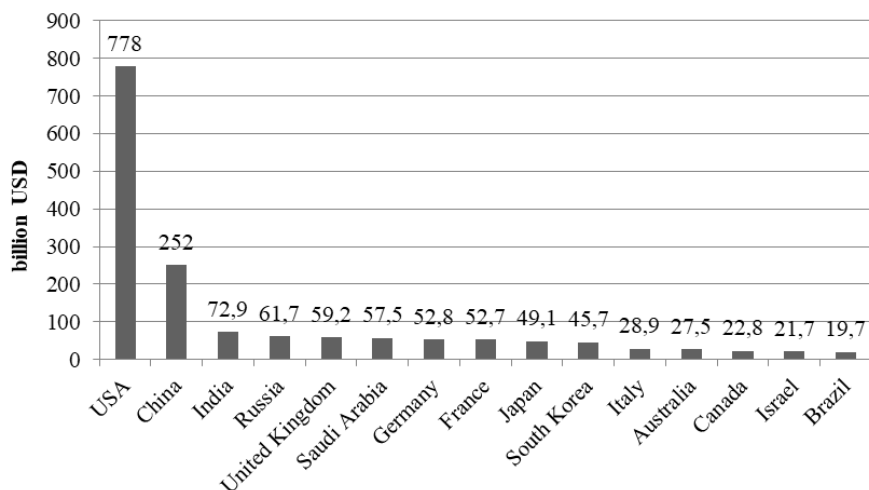


Figure 1.5 - Countries with the highest military spending worldwide in 2020 (in billion USD) [20]

In 2020, Ukraine entered the top 40 countries in the world in terms of military spending. During the year, Ukraine rose in the ranking from 35th place in 2019 to 34th place in 2020. A record 5,9 billion USD was spent on defense in 2020. Compared to 2019, Ukraine's spending increased by 11%, and compared to 2011 - by 198%! On a global scale, in 2020, Ukraine's military spending is 0,3% of all similar spending of all countries of the world combined [17; 18].

There are some peculiarities of modern international arms trade:

- increasing globalization, competition and “commercialization”, reducing the level of differentiation and uniqueness of competing products;
- direct influence of the political situation, instability in the world, increasing the level of territorial claims between countries [21];
- the international arms market is a “buyer's market” where there is aggressive marketing and diversification of trends: highly effective weapons with unique

advantages using the latest technologies are developed and bought by economically developed countries despite their cost, however, for a significant number of market players, the decisive factor is price;

- arms market players prefer long-term relationships based on interstate agreements that ensure the sale of weapons and their maintenance in the long run;
- long-term excess of supply of weapons over demand for them, increasing competition between manufacturers;
- high attention of arms importers to environmental safety, quality, power, compliance with the declared characteristics of weapons;
- recently, there has been a trend of outpacing growth in arms trade for export compared to domestic arms consumption [9];
- in countries with a developed military-industrial complex, arms exports are becoming crucial for reducing the cost of military products and return on investment of manufacturers;
- high cost of disposing of weapons creates an offer of weapons in the market segment with low prices or its free transfer to other countries;
- there is an imbalance in the relationship between economic and military potential of market participants;
- global monopolization of the global arms market, which led to the fact that the five largest exporters (the United States, the Russian Federation, France, Germany and China) in 2016-2020 controlled 76% of the market [9; 22].

1.2 Trends in international arms exports

The world does not always have complete and reliable information on the movement of weapons within and between countries. Further in subsection 1.4 we will explain why this is happening. Therefore, we will focus on the available information.

According to a report by the Stockholm International Peace Research Institute (SIPRI), the supply of major weapons to the international market in 2016-2020 was 0,5% lower than in 2011-2015 and 12% higher than in 2006-2010, as shown on figure 1.6. In 2016-20, the volume of international arms supplies was close to the highest levels since the collapse of the Soviet Union and the end of the Cold War [13; 22].

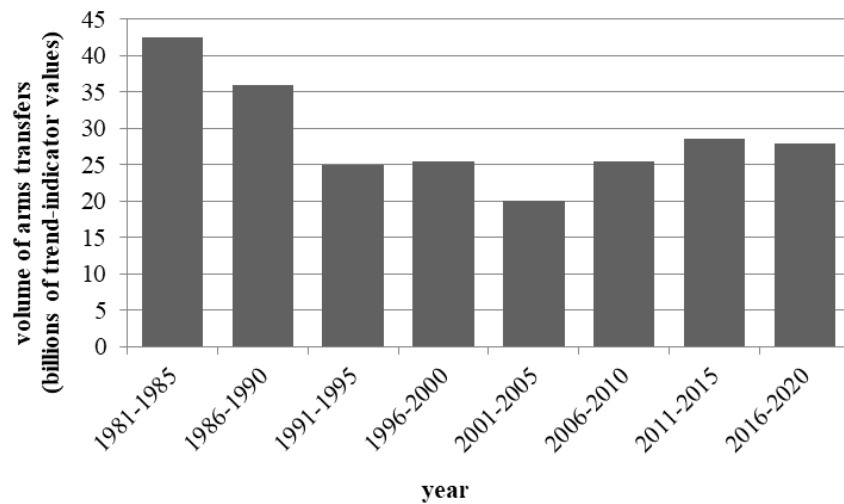


Figure 1.6 - The trend in international transfers of major arms (1981-2020) [22]

The figure 1.6 shows the average volume of arms supplies over 5-year periods since the Cold War. The vertical axis on the graph is the trend-indicator value (TIV), developed by SIPRI as a unique pricing system for determining the volume of supply of conventional weapons. The trend indicator of the delivered goods reflects not its financial value, but its military potential [23].

SIPRI identified 65 countries as major arms exporters in 2016-2020, with the five largest, the United States, Russia, France, Germany and China, accounting for 76% of all arms exports, as shown on figure 1.7 [22].

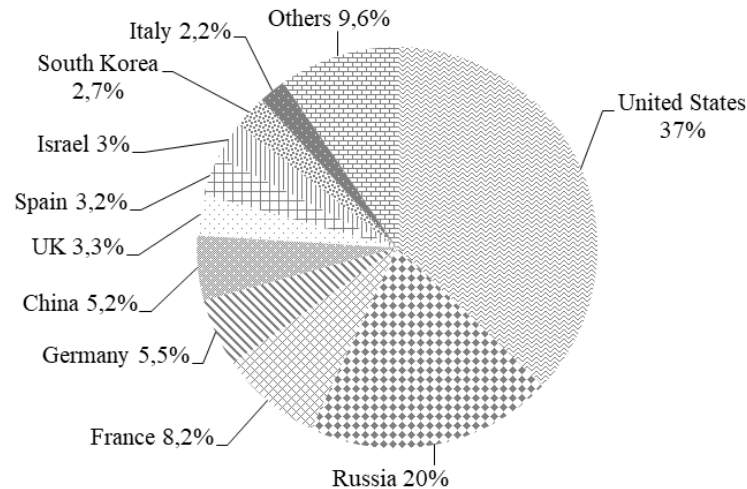


Figure 1.7 - Global share of major arms exports by the 10 largest exporters, 2016-2020 [22]

At the same time, the most dynamic growth in the top five was shown by France. The export figures of the USA and Germany increased, while those of Russia and China decreased, as shown in Table 1.1 [22].

Table 1.1 - The 10 largest exporters of major arms and their main recipients, 2016-2020 [22]

№	Exporter	Share of arms exports (%)		Per cent change from 2011-15 to 2016-20	Main recipients (share of exporter's total exports, %), 2016-20		
		2016-20	2011-15		1st	2nd	3rd
1	USA	37	32	15	Saudi Arabia (24)	Australia (9,4)	South Korea (6,7)
2	Russia	20	26	-22	India (23)	China (18)	Algeria (15)
3	France	8,2	5,6	44	India (21)	Egypt (20)	Qatar (18)

Continuation of Table 1.1

№	Exporter	Share of arms exports (%)		Per cent change from 2011-15 to 2016-20	Main recipients (share of exporter's total exports, %), 2016-20		
		2016-20	2011-15		1st	2nd	3rd
4	Germany	5,5	4,5	21	South Korea (24)	Algeria (10)	Egypt (8,7)
5	China	5,2	5,6	-7,8	Pakistan (38)	Bangladesh (17)	Algeria (8,2)
6	UK	3,3	4,6	-27	Saudi Arabia (32)	Oman (17)	USA (14)
7	Spain	3,2	3,5	-8,4	Australia (33)	Singapore (13)	Turkey (9,7)
8	Israel	3	1,9	59	India (43)	Azerbaijan (17)	Viet Nam (12)
9	South Korea	2,7	0,9	210	UK (14)	Philippines (12)	Thailand (11)
10	Italy	2,2	2,8	-22	Turkey (18)	Egypt (17)	Pakistan (7,2)

As before, the United States of America remained the largest arms exporter in the world in period 2016-20. The share of this world leader in arms exports increased from 32% in 2011-15 to 37% in 2016-20. The geography of deliveries was much wider than that of other suppliers and amounted to 96 countries. The Middle East accounted for 47% of US arms supplies, with Saudi Arabia accounting for more than half of them.

In the same time interval, exports of major weapons from France increased by 44% compared to the previous five years. France's share in global arms sales reached 8,2%. India, Egypt and Qatar became consumers of 59% of French military goods.

Germany increased arms exports by 21% compared to 2011-2015. Germany's share in world arms sales reached 5,5%. South Korea, Algeria and Egypt became the main consumers of German military goods [13; 22].

Russia and China, on the other hand, have shown a decline in arms exports in 2016-2020. Russia's share in world arms exports was 20%. During this period, the volume of Russian arms exports fell by 22% compared to the previous five years. 90% of this decline is due to a drop in Russia's exports to India by 53%. Arms exports from China decreased by 7,8% compared to the same period five years ago. China's share in total world arms exports was 5,2%. Pakistan, Bangladesh and Algeria were the largest recipients of Chinese weapons [13; 22].

In 2016-2020, Ukraine was ranked 12th among arms exporters in the world. Due to the military conflict between Ukraine and Russia, arms exports from the country fell by 68% compared to 2011-2015. The indicators, problems and prospects of Ukrainian arms exports will be discussed in detail in the following sections of this work [22; 24].

We propose to consider the ranking of the 10 largest arms manufacturers in the world in 2020, depicted in the Table 1.2 below. In the top ten are 6 American companies, 3 from China and 1 from the UK. The world's largest arms manufacturer was "Lockheed Martin" from the United States with the defense revenue of 62 562 million USD [25].

Table 1.2 – Top 10 largest arms manufacturers in the world in 2020, in terms of defense revenue [25]

Rank	Company	Country	2020 Defense revenue (in millions USD)	2019 Defense revenue (in millions USD)	Defense revenue change
1	Lockheed Martin	USA	62 562	56 606	11%
2	Raytheon Technologies	USA	42 000	N/A	N/A
3	Boeing	USA	32 400	34 300	-6%
4	Northrop Grumman	USA	31 400	28 600	10%
5	General Dynamics	USA	29 800	29 512	1%
6	Aviation Industry Corporation of China	China	25 468	25 075	2%

Continuation of Table 1.2

Rank	Company	Country	2020 Defense revenue (in millions USD)	2019 Defense revenue (in millions USD)	Defense revenue change
7	BAE Systems	U.K.	23 502	21 033	12%
8	China North Industries Group Corporation Limited	China	15 249	14 771	3%
9	L3Harris Technologies	USA	14 936	14 602	2%
10	China State Shipbuilding Corporation Limited	China	13 379	10 481	28%

The Ukrainian company “Ukroboronprom” ranks 97th among arms manufacturers, selling products worth 650 million USD in 2020, which is 15% less than in 2019 (764 million USD) [25]. Ukrainian arms manufacturers, their condition and prospects will be consider in more detail in the following sections of this work.

1.3 Trends in international arms imports

In 2016-2020, SIPRI identified 164 countries as importers of basic weapons. The leaders of the ranking are Saudi Arabia, India, Egypt, Australia and China, they received 36% of total arms imports in the period, as depicted on figure 1.8 [13; 22].

The largest increase in imports on the world arms market was generated by the Middle East, which in 2016-2020 imported 25% more weapons than in the previous five years. These figures are the result of rivalry between the oil-rich countries of the Persian Gulf [22].

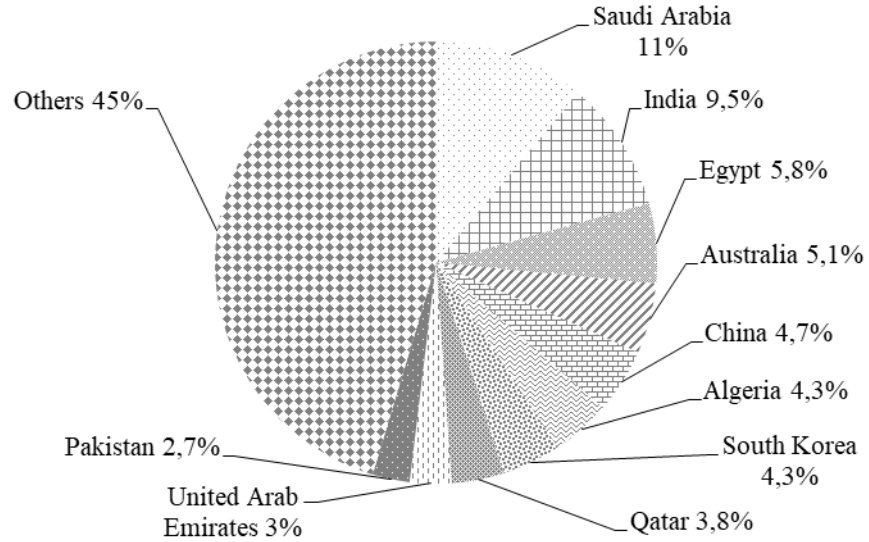


Figure 1.8 - Global share of major arms imports by the 10 largest importers 2016-2020 [22]

From Table 1.3 below we can see that Saudi Arabia was the largest importer of weapons in the world in 2016-2020, having increased its arms imports by 61% compared to the previous five years. Qatar has increased its imports by 361% [22]!

The UAE has reduced its figures by 37%, but 50 US F-35 combat aircrafts and several other planned contracts agreed in 2020 will help it regain lost ground. Disagreements with Turkey over hydrocarbon resources in the eastern Mediterranean have forced Egypt to spend 136% more than in 2011-2015, with most of the money spent on naval development. The cessation of supplies of US F-35 combat aircrafts to Turkey in 2019, after it imported Russian air defense systems, reduced arms imports to this country by 59%, this is also facilitated by the growth of domestic arms production aimed to reduce dependence on imports [13; 22].

42% of world imports of major conventional weapons were made by countries in Asia and Oceania (the largest were India, Australia, China, South Korea and Pakistan) [22].

Table 1.3 - The 10 largest importers of major arms and their main suppliers, 2016-2020 [22]

№	Importer	Share of arms imports (%)		Per cent change from 2011-15 to 2016-20	Main suppliers (share of importer's total imports, %), 2016-20		
		2016-20	2011-15		1st	2nd	3rd
1	Saudi Arabia	11	7,1	61	USA (79)	UK (9,3)	France (4)
2	India	9,5	14	-33	Russia (49)	France (18)	Israel (13)
3	Egypt	5,8	2,4	136	Russia (41)	France (28)	USA (8,7)
4	Australia	5,1	3,6	41	USA (69)	Spain (21)	Switzerland (3,4)
5	China	4,7	4,4	5,5	Russia (77)	France (9,7)	Ukraine (6,3)
6	Algeria	4,3	2,6	64	Russia (69)	Germany (12)	China (9,9)
7	South Korea	4,3	2,7	57	USA (58)	Germany (31)	Spain (6,5)
8	Qatar	3,8	0,8	361	USA (47)	France (38)	Germany (7,5)
9	UAE	3	4,7	-37	USA (64)	France (10)	Russia (4,7)
10	Pakistan	2,7	3,4	-23	China (74)	Russia (6,6)	Italy (5,9)

Japanese arms imports increased by 124%. Although the purchase of weapons by Taiwan in 2016-2020 were lower than in 2011-2015, in 2019 this country placed several large orders for the purchase of weapons in the United States, including combat aircraft [22].

India has reduced arms imports by 33% compared to 2011-2015. Russian and American arms supplies to India fell the most. The main reason for this is the country's attempt to reduce its dependence on Russian weapons. There is information that India will try to diversify its purchases and make up for lost in supplies in the coming years [22].

1.4 Arms control and transparency issues

The control of the movement of weapons and military technology is a rather complex but necessary process on a global scale. Especially in the case of participants of armed conflicts to which the world community imposes restrictive sanctions or imposes embargoes. There are legal “white” arms market, illegal “black” and market of “gray” trade. “Black” exports are carried out under appropriate schemes for the purpose of self-enrichment with the creation of special companies or simply for cash settlements with people who have access to weapons, sometimes representatives of military units. “Gray” exports occur when there are no official international bans on arms supplies to a particular country or territory, but the exporter for some reason does not want to operate under the “supplier-end user” scheme. This is sometimes due to the transfer of technologies that are subject to restrictions or the support of extremist movements that conduct military action against officially elected governments [5; 26].

The principles of control over international transfers of military goods have been agreed by most of the world’s leading countries. The same applies to related dual-use goods, as well as goods that can be used to create weapons of mass destruction and their means of delivery. These principles are embodied in such international arms export control regimes as the Zangger Committee, the Wassenaar Arrangement, the Nuclear Suppliers Group, the Missile Technology Control Regime and the Australian Group [6; 26].

The Zangger Committee is an informal organization established in 1971 to implement the Treaty on the Non-Proliferation of Nuclear Weapons. Each State Party has undertaken not to provide nuclear materials and related equipment to non-nuclear states. The Zangger Committee has a definite list of materials and equipment that are subject to export control. Today, the Zangger Committee consists of 39 states, including Ukraine [27; 28].

The Wassenaar Arrangement was established in 1995 in Wassenaar, the Netherlands, from which it got its name, and replaced the Coordinating Committee for Multilateral Export Controls. 42 states, including Ukraine, are participants in the Wassenaar Arrangement. The main objective of the Wassenaar Arrangement is to promote international security and stability by promoting transparency and accountability in the trade in conventional arms and dual-use goods and technologies to prevent destabilizing arms stockpiling [29].

Another goal of the Wassenaar Arrangement is to prevent the transfer of conventional weapons to terrorists and to supplement other international export control regimes for weapons of mass destruction and their means of delivery. There is a regular exchange of information of a general and specific nature between the participating States, in particular on the transfer of arms to the states that are not members of the regime [30].

The **Nuclear Suppliers Group** is an informal association of a number of nuclear goods suppliers that was established in 1978. The main tasks are to control the export of equipment, technologies and materials that can be used in the production of nuclear weapons. Today, the union includes 48 states, including Ukraine, as well as two permanent observers: the Zangger Committee and the European Commission [27; 31].

The **Missile Technology Control Regime** was established in 1987 by concluding an informal political agreement and bilateral exchange of diplomatic notes between the participating states. The main task is to reduce the proliferation of missiles, in particular those that can be a means of delivering nuclear charges, other unmanned systems of delivery of weapons of mass destruction. Today, the Missile Technology Control Regime consists of 35 states, including Ukraine [27; 32].

The Australia Group is an informal union of states established in 1985 to limit the proliferation of chemical and biological weapons. This goal is achieved by establishing appropriate rules of export control. The members of the Australia Group are 43 countries, including Ukraine [27].

Transparency in world arms trade is a necessary precondition for promoting international cooperation in arms control and providing the necessary information to journalists, democratic governments, parliaments, and the United Nations to counter militarization and the preservation of humanity [5; 6].

In this context, an important international instrument of transparency in the arms trade is the United Nations Register of Conventional Arms (UNROCA), established in 1991 to strengthen trust between states and prevent the destabilizing stockpiling of weapons. All UN member states are invited to submit annual reports on a voluntary basis on their imports, exports and purchases from domestic manufacturers of conventional weapons, including small arms and light weapons [33; 34].

In 2001, 126 states submitted such reports and only 44 states reported in 2015. Even arms market leaders such as China, France and Italy did not report for 2015! Moreover, inaccurate information is often submitted to the register [33].

The UN has once again shown its incompetence in security matters. What can be expected from an organization in the Security Council of which at least one aggressor state is a permanent member with the right of “veto”, which can block any good deed for humanity without even giving anyone an explanation.

The Stockholm International Peace Research Institute (SIPRI), established in 1966, is the widely recognized and most authoritative source of data on the international arms trade, which studies conflicts, armaments, arms control and disarmament. It is an independent, based on open sources database for the world community, politicians, researchers, the media, the public. The SIPRI arms transfer database contains detailed, high-quality, and reliable information on international arms transfers obtained from a variety of sources: official reports from the government, companies, the media, and even sources such as military parade photographs. However, there are disadvantages of such an information retrieval system, since deliveries are often estimated on the basis of conjecture and guidance [33].

As we can see, the world arms market is working, growing, and outpacing the development of most other markets and areas of human activity. Analyzing the above information, involuntarily comes the feeling that the world is preparing for another global confrontation. Human nature has changed over the millennia of existence. Involuntarily I want to add to the list of keywords of this work: “take away”, “protect”, “conflict”, “attack” and “defense”. More than a hundred years ago, the League of Nations was created to prevent military conflicts, and was replaced by the United Nations. Either it was created the stillborn and new levers are needed to maintain peace on the planet, or something is wrong with genetics of humanity, constantly encouraging it to self-destruction.

2 DEFENSE-INDUSTRIAL COMPLEX AND THE ARMED FORCES OF UKRAINE. STATE AND PROSPECTS

2.1 The state of the defense-industrial complex in the context of providing the armed forces of Ukraine and increasing the export potential of the state

For the leadership of most industrialized countries, their own defense-industrial complex is an important part of the country's national security and defense strategy. Considerable attention is paid to the development and support of enterprises and organizations of the defense industry. Significant financial, technical and technological resources are concentrated on this.

The defense-industrial complex is in fact the foundation of the country's military security and defense. Therefore, maintaining its high level of development for many leading countries is one of the most priority tasks of public policy. Most countries of the world are constantly re-equipping their armed forces with qualitatively new models of armaments and military equipment, modernizing the defense-industrial base in accordance with modern political conditions. They see their main goal in the ability of their own defense-industrial complex to solve the tasks set in the field of national security and defense.

In 2020, for the first time in the history of independent Ukraine, the Cabinet of Ministers conducted a Review of the national defense-industrial complex. The main purpose of the work was to objectively assess the capabilities of the defense-industrial complex of Ukraine to meet the needs of the security and defense sector in armaments, ammunition, military and special equipment, taking into account current military and political threats [35].

Despite a number of problematic issues in the defense-industrial complex, its condition was considered satisfactory for solving specified tasks, including ensuring the production of modern models of weapons and military equipment.

The results of the review were approved by the relevant decision of the National Security and Defense Council of Ukraine of April 21, 2021 [36] and put into effect by the Decree of the President of Ukraine of April 21, 2021 № 168/2021 [37].

The results of the review are not available in the media for obvious reasons but based on them, the decision of the National Security and Defense Council of Ukraine of June 18, 2021 “On the strategy for the development of the defense-industrial complex of Ukraine” was developed and approved by the relevant Decree of the President of Ukraine of August 20, 2021 № 372 / 2021 [38].

It sounds optimistic, but is everything so good and is the Ukrainian defense-industrial complex really able to provide the Ukrainian army and significant foreign exchange earnings from arms exports? The current situation in the defense-industrial complex is characterized by significant deterioration of the material and technical base of research and production structures, the lack of modern scientific and technological developments, a serious rupture in relations between science and industry. The creation of innovative products ends at the initial stages of the innovation cycle and is not brought to mass production.

The situation is complicated by the loss of a number of basic technologies in the defense industry, limited closed production cycles, reducing the range of products, especially electronic equipment; low level of quality of components and materials, unreasonably high level of their cost. Finishing production of military equipment in Ukraine largely depends on imported supplies of components, units, aggregates, materials and raw materials. For some models of weapons and military equipment, these supplies reach 80% or more [39].

The state part of the defense-industrial complex enterprises is represented by the State Concern “Ukroboronprom” - an association of enterprises of the defense-industrial complex of Ukraine under state management. The concern includes enterprises of defense-industrial complex, which carry out economic activities in the field of development, manufacture, sale, repair, modernization and disposal of weapons, military

and special equipment and ammunition. Prior to the loss of the territories of Crimea and Donbass, the concern consisted of 137 enterprises, now it consists of 116 production units. According to Western researchers, the problem of corruption in Ukroboronprom is much more acute than in the country as a whole [40].

Recently, Ukroboronprom reported on the results of work for the three quarters of 2021. In the field of production, the concern reports significant growth. Production volumes for 9 months of 2021 amounted to 26,8 billion UAH, having increased by 27,4% compared to 9 months of 2020 (plus 5,8 billion UAH). Contracts worth 694 million USD were concluded, which is 74% more than in the same period of 2020. 454 million USD came from arms exports, which is 45% more than in 9 months of 2020. In January last year (2020), the concern switched to the PROZORRO e-procurement system, which saved 592,1 million UAH in just 9 months!

On October 6, 2021, the Law of Ukraine № 1630-IX “On the peculiarities of reforming the enterprises of the defense-industrial complex of the state form of ownership” came into force, which, according to the state leadership, should be the engine of further growth of the country’s defense industry [41].

We will talk about the share of private enterprises in the development of the domestic defense industry in the next section, but in advance we can say that this share is constantly growing. And in most highly developed countries, the private production sector is the backbone of the defense industry. The main thing is that our private arms manufacturers do not become a feeder for the corrupt in power, and state orders are issued not on the principle of nepotism and family relations, but based on the competitive principles and interests of our state.

As for the rating of companies of the Ukrainian defense-industrial complex in terms of revenue, in 2020 the first place was taken by a PJSC “Motor Sich” with revenue of 422,2 million USD. The second and third places were taken by state-owned companies “Antonov” and “State Kyiv Design Bureau Luch” with revenues of 277,8 million USD and 140,7 million USD respectively, as shown on figure 2.1 below [42].

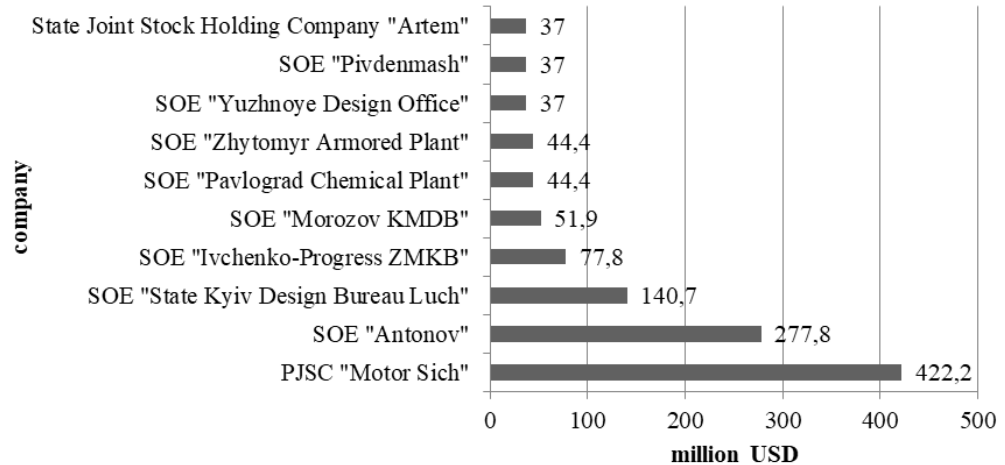


Figure 2.1 - Top 10 largest Ukrainian companies producing military products in 2020, in terms of revenue [42]

It should be noted that in the field of military equipment production there are still internal reserves that can ensure significant growth of the defense-industrial complex and, accordingly, provide significant opportunities in the staffing and re-equipment of the Armed Forces of Ukraine. Ukraine's defense-industrial complex in cooperation with international companies is able to organize the production of missile systems, reactive complexes of volley fire, military transport aircraft, armored vehicles and tank engines, anti-tank missile systems, multifunctional corvettes, systems and means of air and missile defense, portable anti-aircraft missile systems, guided "air-to-air" and "air-to-ground" missiles, certain types of artillery and small arms, means of sound and radio engineering, optical, acoustic intelligence, radio reconnaissance and radio suppression, explosives, certain types of ammunition, etc.

Ukraine lags far behind in the creation of information technology, which is now considered the basis of technical progress, and without the use of which it is impossible to create modern military equipment. In Ukraine, there are technologies for the production of new composite metal, aluminum and light armored materials based on titanium alloys, technologies of manufacturing optical elements for devices of aviation

and space equipment, technologies of production of engines with the increased operational characteristics. First of all, Ukraine needs the modernization of combat aircraft and helicopters, air and anti-ship defense systems, and the acceleration of the development of a multifunctional missile system and a corvette [39].

Relevant specialists have to decide whether these products and their technical characteristics will meet the Ukrainian army's request, whether the price-quality ratio will be at the required level. The "litmus paper" of the quality of products of the Ukrainian defense-industrial complex should be the assessment of such equipment on the international arms market. Unfortunately, we see that given the constant decline in Ukraine's share in the world arms market, the picture is very far from optimistic.

2.2 The Armed Forces of Ukraine as the main consumer of defense-industrial complex products and arms imports

According to the London International Institute for Strategic Studies, its 2021 edition of *The Military Balance* provides a list of armaments and military equipment of the Ukrainian army, given in the Table 2.1 [43].

Table 2.1 - Armaments and military equipment of the Ukrainian army in 2021 [43]

Type of weapon	Number of units
tanks	858
infantry fighting vehicles	1184
armored personnel carriers	622
reconnaissance armored vehicles	547
artillery	1818
tactical missile systems	90

Continuation of Table 2.1

Type of weapon	Number of units
attack helicopters	35
multi-purpose helicopters	23
frigate	1
military ships of a smaller class	10
fighter planes	71
bombers	14
attack aircraft	31
transport aircraft	29
S-300 complexes	250
Buk missile system	72
S-125	Not specified

At first glance, it seems that not everything is so bad. But we must understand that most of the above are obsolete examples of Soviet military equipment. After the collapse of the Soviet Union, Ukraine inherited many Soviet-made armaments and military equipment. Today, the Armed Forces are almost complete, but a significant part by their tactical-technical and combat characteristics are much inferior to world analogues. About 20% of all models of armaments and military equipment of the Armed Forces of Ukraine can be considered modern [39].

Let's consider the state of armaments and military equipment of the Armed Forces of Ukraine. Modern models include T-80, -84 tanks and BTR-80 armored personnel carriers. The basis of armored weapons and military equipment are T-64, -72, -80, -84 tanks, but only a little more than a third of the Ukrainian tank fleet has been improved or refined in some way, infantry fighting vehicles (BMP-1, -2; BMD-1, -2; BRM-1K) and armored personnel carriers (BTR-60, -70, -80 -4). T-64 tanks and BTR-60 armored personnel carriers are physically and morally obsolete and need to be replaced. BMP-1, BMD-1, BRM-1K, which make up half of the total number of infantry fighting vehicles,

have low technical and operational characteristics. These machines are so outdated that, according to experts, their modernization is almost impossible. Cannot be attributed to modern T-72 tanks, armored personnel carriers BTR-70 and infantry fighting vehicles BMP-2 and BMD-2.

The basis of the Air Force are bombers (Su-25, -24M), attack aircraft (Su-25), fighters (MiG-29, Su-27), military transport aircraft (An-26, -30, -72; Tu-134A, -154; IL-62, -76D), helicopters (Mi-8, -9, -6, -24 and others), unmanned aerial vehicles (UAVs). In most of the listed aircraft the technical resource of operation is exhausted or comes to an end and they need to be replaced with new ones. In the conditions of modern war, Ukraine's aviation is more of a ballast than a kind of military [39].

Ukraine does not have its own production of combat helicopters. Some way out of the situation was the development mastering by PJSC "Motor Sich" of the production and modernization of turbofan engines TVZ-117, which are used in combat helicopters Mi-28 and Ka-50, which creates significant opportunities for the Armed Forces of Ukraine.

MiG-29 aircraft and Su-27 fighter jets are obsolete both morally and physically, but with the modernization of their tactical-technical and combat characteristics they can be brought to the level of machines of 4th generation, although all civilized armies have been operating 5th generation machines for decades. The basis of military transport aviation can be a domestic An-70 aircraft, which confidently corresponds to the spirit of the times in terms of characteristics [39].

The Armed Forces of Ukraine is equipped with anti-aircraft missile systems: long-range (S-200V); medium-range (S-300PT/PS, -300V1, -75M3); low-range ("Buk", S-125M1). Domestic defense-industrial complex have the ability to produce radar stations and to upgrade existing systems.

The air defense of the Land Forces of the Armed Forces of Ukraine is provided with anti-aircraft missile systems "Kub", "Osa-AK", "Tor", "Strela-10", anti-aircraft artillery and missile systems "Tunguska", portable anti-aircraft missile systems ("Igla",

“Igla-1”) and anti-aircraft guns (KS-19, S-60, “Shilka”, ZU-23). Almost all of them are obsolete and have reached the end of their service life.

Most of the ships in service with the Ukrainian Naval Forces do not meet modern requirements and have insignificant service life. Shipyards in Ukraine are capable of producing hulls of warships of various types, but Ukraine does not have the appropriate artillery, missile, anti-submarine, anti-aircraft, mine and torpedo weapons. In the case of self-construction of ships, about 60% of their value will be imported key systems and weapons [39].

These data show that despite the almost complete staffing of the Armed Forces of Ukraine with weapons and military equipment, the level of their combat capability does not meet the necessary requirements. Much of the ammunition came from the USSR concentrated on military arsenals, which explode with enviable consistency, mostly due to fires (more than two dozen times during Ukraine’s independence), causing enormous damage to the state. Experts name the sums up to five billion dollars, and as we will see later it is more than the annual budget of the Ukrainian army [44].

However, in addition to financial losses, such fires, especially due to the loss of large-caliber shells, have critical consequences for the combat capability of the armed forces. Two years ago, it was quite possible in the Armed Forces of Ukraine that large-caliber batteries with the probable aggravation of the situation at the front will be silent due to lack of shells. The shortage of large-caliber shells in the army remains acute, despite the fact that the defense-industrial complex has managed to establish their production. All fires took place in strategically important military depots with scarce ammunition [44].

In the coming months, the Bellingcat Group will complete its investigation of the causes of fires and explosions at ammunition depots in Ukraine. Investigators are checking the involvement of Russia’s military intelligence in these incidents. The possibility is being investigated that they were the result of the work of the same group

of the GRU of Russia, which is behind the explosions at military plants in the Czech Republic and Bulgaria [45].

Bellingcat notes that the explosions at arms depots in the Czech Republic in 2014 were part of a long-term GRU operation, which aimed to undermine Ukraine's ability to purchase weapons and ammunition to counter the aggression of Russia and its militants in eastern Ukraine [46].

Now the situation with ammunition is improving. The defense-industrial complex fills warehouses with Ukrainian-made ammunition. However, there is no guarantee that one day Russian saboteurs will not let them "red rooster". The only way out is to review the conditions for storing weapons and ammunition in Ukrainian military depots [44].

There are some main ways to ensure the combat capability of the Armed Forces of Ukraine. Obviously, a miracle will not happen, Ukraine's economy will not soon be among the ten largest economies in the world, and therefore will not be able to provide the army with significant opportunities for full-fledged modern weapons and equipment. Given this, it is obvious that the technical basis of the Armed Forces of Ukraine today and in the perspective will be armaments and military equipment left to Ukraine after the collapse of the Soviet Union. Therefore, the main real ways to maintain them in combat readiness are:

- gradual modernization and improvement of military equipment by enterprises and organizations of the domestic defense-industrial complex;
- establishment of timely technical inspection, maintenance, preventive work and timely repair of armaments and military equipment;
- unification and reduction of the nomenclature of armaments and military equipment, decommissioning of hopelessly obsolete models of armaments.

The deep crisis in the economy and the slow pace of overcoming it leave no hope for the rapid re-equipment of the Armed Forces of Ukraine with the latest models of basic armaments and military equipment. The problem of organizing their own

production, despite its importance and relevance, can be solved only after overcoming the economic crisis and a significant increase in budget funding for the purchase of armaments and military equipment and conducting relevant research-development and research-design work [39].

For Ukraine, as for many countries around the world, the gradual modernization of armaments and military equipment is one of the main ways to increase the effectiveness of the combat potential of the armed forces. There are more than 40 enterprises in the system of the Ministry of Defense of Ukraine that are able to modernize and repair a significant part of the existing armaments and military equipment, which is the legacy of the former USSR. To date, part of the MiG-29, Su-27, Su-24M, Su-24MR, Su-25 and L-39 aircraft have been upgraded. They have improved characteristics of the engines, installed new navigation and aiming equipment. The replacement of expired transport aircraft with new Ukrainian-made aircraft - An-70, -140, -148 remains a matter of time.

With a well-developed armored industry, Ukraine is able to modernize T-64 and T-72 tanks at minimal cost, which has been done in recent years [39].

Assistance from the United States and NATO countries, as well as imports of armaments and military equipment, are important levers for improving the state of the armed forces. We will talk about this in more detail in the next section.

Let's consider the financing of the armed forces of Ukraine. As mentioned before, Ukraine, despite being a participant in a full-fledged armed conflict, in 2020 ranked 34th in the world in terms of defense spending. Expenditures on the Ministry of Defense of Ukraine have increased significantly since 2015 and amounted to 117,5 billion UAH in 2021. At the same time, expenditures of 131 billion UAH are planned for 2022. How expenditures on the Ministry of Defense have changed in recent years is shown on the figure 2.2 [47; 48; 49].

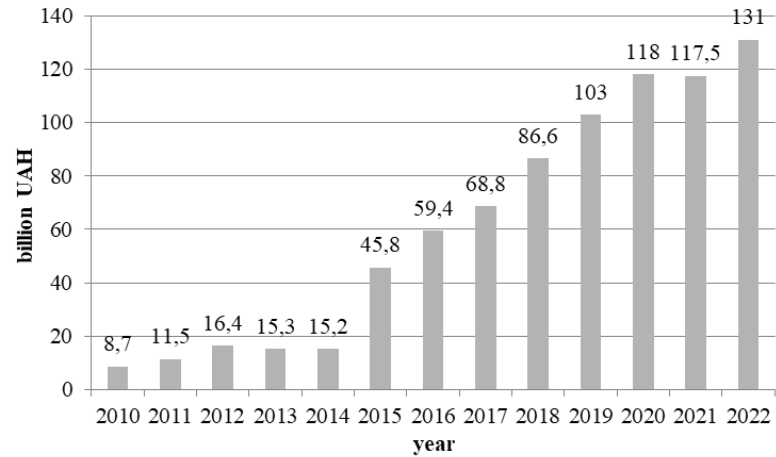


Figure 2.2 - Expenditures on the Ministry of Defense of Ukraine (2010-2021) [47; 48; 49]

According to the National Security Strategy and the Security and Defense Sector Development Concept, the annual budget funding of the security and defense sector must be at least 5% of gross domestic product (GDP). The state budget of Ukraine for 2021 envisages 267,1 billion UAH for these needs, which is 5,93% of GDP. The distribution of these funds is shown on figure 2.3 below [48].

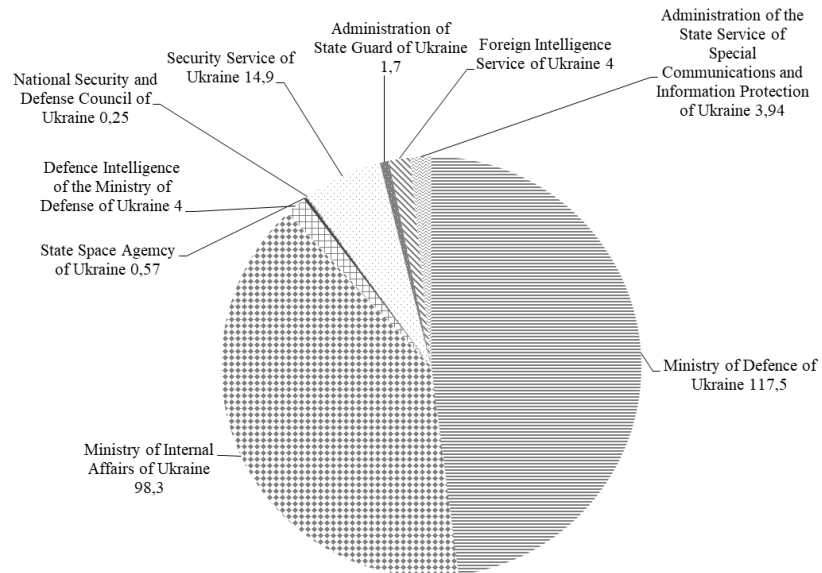


Figure 2.3 – Distribution of budget funding on the security and defense sector of Ukraine, 2021 [48]

However, as we can see from figure 2.3, the army directly through the Ministry of Defense will receive only 117,5 billion UAH. Thus, the state budget of Ukraine for 2021 envisages expenditures for the Ministry of Defense of Ukraine in the amount of 117,5 billion UAH, which is 0,5 billion UAH less than the final version of the 2020 defense budget [48].

At the same time, as shown on the figure 2.3, expenditures on the Ministry of Internal Affairs amounted to 98,3 billion UAH, which is 5,3% more than in 2020. Security Service of Ukraine will receive 14,9 billion UAH (+22,8%), the Foreign Intelligence Service of Ukraine will be able to operate in the amount of 4 billion UAH (+69,5%), the National Security and Defense Council of Ukraine - 0,25 billion UAH (+18,5%), Administration of State Guard of Ukraine - 1,7 billion UAH (+4,5%). Administration of the State Service of Special Communications and Information Protection of Ukraine will receive 3,94 billion UAH (+35,5%) [50].

So, in general, the impressions of the defense budget are ambiguous. In general, more money is actually provided for security and defense than in previous years. However, the Ukrainian Armed Forces, which are currently at the forefront of this security and defense, should receive less funding in the current year than they had in 2020. And this is quite an alarming signal, because such a decrease, as seen on the picture 2.2 occurs for the first time since the beginning of the war in Donbass, it takes place in conditions when the Armed Forces of Ukraine are not even close to being provided with everything they need, moreover, when the enemy's troops are massively gathered at the borders, and the intelligence of most of the allies speaks of the possibility of invasion this winter. There is a rhetorical question: with whom and with what means does our state plan to fight an external aggressor [50]?

2022 budget figures adopted only in the first reading by the Verkhovna Rada of Ukraine on November 2, 2021 look more optimistic than this year, but let's not forget about the real inflation rate, which confidently destroyed the benefits of the new budget, in addition, in the structure of expenditures of the security and defense sector in the draft

budget for 2022 provides for an increase in total expenditures by 19,5% (from 267,3 to 319,4 billion UAH) compared to 2021, as shown on the figure 2.4, at the same time spending on the Ministry of Defense will increase by only 11,5% [48; 49].

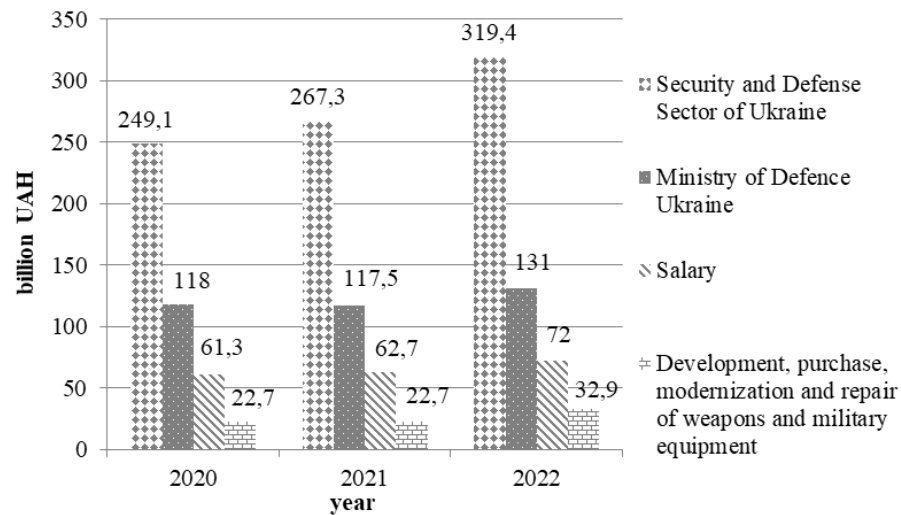


Figure 2.4 - The main indicators of the defense budget of Ukraine for 2020-2022 [48; 49]

As we can also see from figure 2.4, a great part of the costs is directed to salaries and significantly exceeds the funds spent on development, purchase, modernization and repair of weapons and military equipment. In addition, let's not forget that in countries that really care about their own defense capabilities, the amount of salary costs does not exceed a third of the defense budget (for example, the United States has a rate of 27%, and this despite the fact that the level of earnings of American soldiers is an order of magnitude higher than ours. Most of the remaining funds go to development, technology, training, etc.).

Regarding the number of the Armed Forces, the official website of the Ministry of Defense of Ukraine publishes an updated number of the Armed Forces of Ukraine in 2021. As of February 2021, there are 246 445 people in the Armed Forces of Ukraine, in Table 2.2 they are divided into some categories [51].

Table 2.2 - The number of the Armed Forces of Ukraine [51]

Category	Number	
servicemen	195 626	
	servicemen involved in the Joint Forces Operation	40 114
	servicemen serving abroad	359
	national servicemen	20 647
employees in the positions of servicemen	3 973	
civil servants and employees (without those mentioned above)	46 846	

Of course, 250 000 hats are very serious weapons, but the recent confrontation in Nagorno-Karabakh is a strong argument that the time to fight with hats is long gone. The Nagorno-Karabakh conflict has shown that the models of the latest weapons are really changing the balance of power in the theater of military actions. Azerbaijan, which suffered defeats and failures in the conflict with the more militarily powerful Armenia, at one time lost much of the territory. But it took a different path: it did not increase ground weapons and very expensive aircraft and air defense, but paid attention to new unmanned aerial vehicle systems (UAVs).

According to some data, an Azerbaijani-Turkish contract has already been signed for the export of 36 Bayraktar TB2. That is, there are several unmanned strike squadrons that is able to strike a significant blow. There are still 6 such UAVs in Ukraine, but there are a real example of application and excellent strategic prospects.

Poland spends four times more than Ukraine on rearmament. At the same time, the Polish army is twice smaller than the Ukrainian army - 123 thousand soldiers against our 250 thousand. Of course, we do not have to hope for a miracle in our situation. Difficulties in the state's economy will not allow a significant increase in the defense budget in the near future. At the same time, reducing (optimizing) the army can free up

money for rearmament and make the army more efficient. And this is not about reducing the number of soldiers who are able to give an adequate military response to the enemy, this is not about patriots defending our freedom in the trenches of Donbass. This is about an anachronistic bureaucratic mechanism that the Ukrainian army inherited from the USSR.

3 INTEGRATION OF UKRAINE INTO THE WORLD ARMS MARKET

3.1 Export of weapons from Ukraine

At the time of the collapse of the USSR, Ukraine had 1810 enterprises of military-industrial complex, 6500 tanks, 7000 other armored combat vehicles, 7200 artillery systems, more than 500 ships and vessels and 1100 combat aircraft. The technologies of Ukrainian companies made it possible to produce 12 of the 20 most powerful missile technologies of the Cold War, including the unparalleled “Satan” (developed by design bureau “Southern” Dnipro). Ukraine was therefore actually doomed to trade in arms and military technology [52; 53].

From 1992 to 1996, during the period of Ukraine’s establishment as a state, 113 enterprises were actually engaged in arms trade, in most cases using so-called gray schemes. This critical sphere of business was taken under state control only in October 1996, when the “Ukrspetsexport” concern was established. Subsequently, the right to export weapons was granted to a number of other enterprises, including “Spetstechnoexport”, “Ukroboronservice”, “Ukrinmash”, “Progress”, “TASKO-export” and “Promoboronexport” [54].

As of today, from August 2018, the government has simplified the procedure for granting Ukrainian enterprises the right to export and import military goods and goods that contain data that constitute a state secret. This greatly simplified market entry for private defense companies, which previously exported military products only through a state-owned company [54].

Until 2011, the sale of aircraft and the provision of services for its modernization and repair occupied a leading position in military exports. Armored vehicles took second place. However, after concluding a number of contracts, including the supply of “Oplot” tanks to Thailand in 2011, trade in armored vehicles came out on top. That is, we were still able to produce heavy and iron, but our light and technological are increasingly

becoming uncompetitive in the world market. The third place was traditionally occupied by trade in air defense equipment.

The amount of sales of military property in 2005-2014 amounted to nearly \$2 billion. The number of units of various types of weapons sold by Ukraine during this period is given in the Table 3.1 below [54].

Table 3.1 - Quantitative indicators of Ukrainian arms exports for the period 2005-2014 [54]

Type of weapon	Number of units
planes	202
helicopters	232
BMP and APC	714
tanks	832
cars	4930
missile and artillery armament	28555
small arms and ammunition	1,824 million

The situation of arms exports has changed dramatically since the start of the armed conflict in 2014. Ukraine urgently needed large volumes, so all the resources of the defense-industrial complex were used to staff the Ukrainian army. For the same reason the execution of part of the export contracts was temporarily suspended, and the National Guard received T-64 tanks and BTR-3 that had to be exported to Angola and Thailand.

After 2015, the situation on the domestic market stabilized, but Ukraine did not reach the former export volumes. The war devastated weapons depots left over from the USSR. The basis of exports are now high-tech (from the point of view of the Ukrainian defense-industrial complex) products such as guided anti-tank missiles. Today, the main source of income for the defense industry of Ukraine is the sale of anti-tank systems “Corsair” and “Stugna-P”, as well as other high-precision ammunition developed mainly by the Kyiv design bureau “Luch” [54; 55].

Among the main importers of Ukrainian weapons in 2019 were China, India, Saudi Arabia and Turkey. The largest importers of weapons from Ukraine in the period 2016-2020, according to SIPRI, were China (which accounts for 36% of Ukraine’s total arms exports), Russia (20%) and Thailand (17%) [22]. Despite its military aggression against Ukraine, it is not the first time that Russia has become one of the leaders in Ukrainian arms exports, according to SIPRI. The fact is that the only export item is the interaction between Ukraine and Russia within the framework of the agreement on the production by Russia of 15 An-148-100E aircraft. These agreements were reached in 2011-2013, the delivery of goods in accordance with them was planned in 2013-2017. However, SIPRI experts “assume” that the Ukrainian parts could be provided to Russia in the period 2015-2018 [56].

In 2012 Ukraine was very successful in arms export, gaining 1501 million USD. Country was ranked fourth among the world’s major arms exporters in that time. It was mainly due to a contract with China, according to which the Ukrainian side pledged to supply it with hovercraft [57]. However, in 2015 arms exports from Ukraine amounted to 353 million USD, and in 2020 to 115 million USD, as shown on the figure 3.1 below [58].

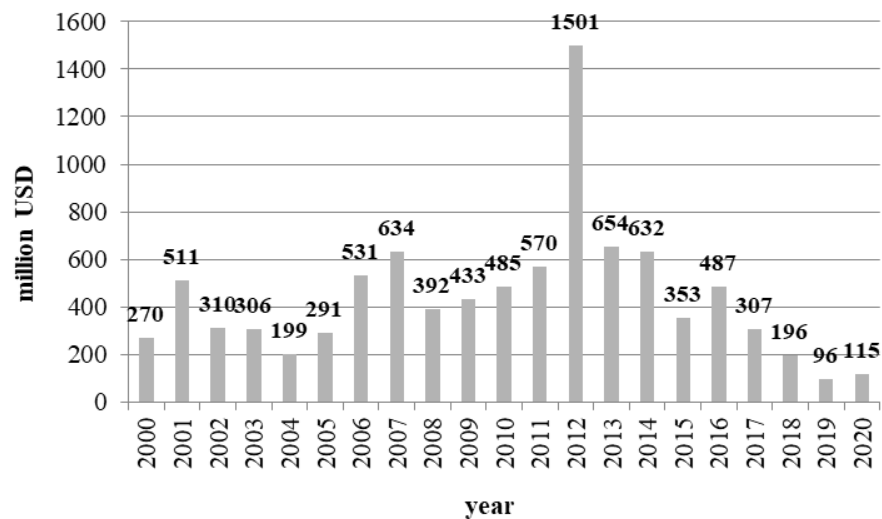


Figure 3.1 – Ukraine’s arms exports in 2000-2020, million USD [58]

These figures, however, do not include revenues from services for the repair and modernization of military equipment, as well as the supply of components.

As for the largest Ukrainian companies-exporters of weapons and military equipment, in 2020 the first place was taken by PJSC “Motor Sich”, with revenue of 137 million USD. Among the main company’s importers were China (65% of exported goods) and the United Arab Emirates (10%). The second place was taken by the PJSC “Fed” with revenue of 5,9 million USD and China as a major importer (90%). LLC “Okean Shipyard” earned 5,5 million USD and took third place, the main importers were the Netherlands (60%) and Panama (40%). Other companies can be seen on figure 3.2 below [42].

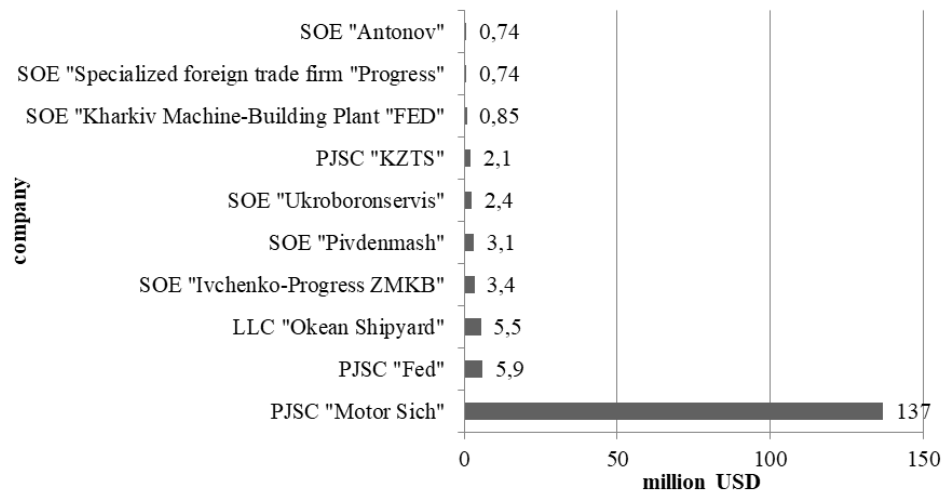


Figure 3.2 - Top 10 Ukrainian companies-exporters of military products in 2020, in terms of income [42]

The State Export Control Service of Ukraine provides information on the export of certain categories of weapons carried out by Ukraine in 2020. According to the data in Table 3.2, in 2020 Ukraine exported 3 armored combat vehicles and no battle tanks, large caliber artillery systems, combat aircraft, combat helicopters, warships, missiles and missile launchers [59].

Table 3.2 - Information on the export of certain categories of weapons made by Ukraine in 2020 [59]

Weaponry	Country of the final consumer	Quantity	Type
Battle tanks	-	-	-
Armored combat vehicles	Indonesia	2	Armored car “Kozak 2”
	Uganda	1	Armored BTS-4 tractor
Large caliber artillery systems	-	-	-
Combat aircraft	-	-	-
Combat helicopters	-	-	-
Warships	-	-	-
Missiles and missile launchers	-	-	-

As for exports of small arms and light weapons, portable anti-aircraft missile systems the State Export Control Service of Ukraine also provide certain information. According to the data in Table 3.3, in 2020 Ukraine exported 26 revolvers and pistols, 5 rifles and carbines, 21 submachine guns and machine pistols, 1 light machine guns and 251 portable anti-tank guided missiles and missile systems [59].

Table 3.3 - Ukraine exports of small arms and light weapons, portable anti-aircraft missile systems in 2020 [59]

Category/subcategory	States - end consumers	Quantity
small arms and light weapons		
I. Small arms:		
- revolvers and pistols	USA	10
	Poland	16
- rifles and carbines	United Arab Emirates	5
- submachine guns and machine pistols	Indonesia	21
- assault rifles	-	-
- light machine guns	Israel	1

Continuation of Table 3.3

Category/subcategory	States - end consumers	Quantity
small arms and light weapons		
II. Light weapons:		
- heavy machine guns	-	-
- hand, under-barrel and easel grenade launchers	-	-
- portable anti-tank rifles and grenade launchers	-	-
- portable anti-tank guided missiles and missile systems	Qatar	51
	Chad	53
	Bangladesh	23
	Morocco	124
III. Portable anti-aircraft missile systems:		
- starting mechanisms	-	-
- missiles	-	-

3.2 Domestic market

Until 2014, the Ukrainian defense-industrial complex received almost no orders from the Armed Forces of Ukraine. Some samples of domestically produced weapons were accepted by the Ukrainian army only formally, in order to be able to export. This was the case, by the way, with “Oplot” tanks, which the Ukrainian army bought only two. However, the events of 2014 radically changed the situation.

From July 2014 to July 2017, the Army of Ukraine received from Ukrainian enterprises 5281 units of new and modernized equipment, 7164 units of refurbished equipment, 3458 units of spare parts, units and aggregates. In 2018, 6764 units of new

and modernized weapons, equipment and special purpose products were received, in 2019 - 7436 units [54].

3.3 Ukraine's arms import

Arms supplies are a special issue for many countries, as there is a certain code of conduct on military-political issues. One of the components of this code is to avoid arms supplies to conflict zones. The world community reacts especially negatively to the supply of lethal weapons to the parties to the conflict, double attention is paid to civil confrontation. Therefore, in order to avoid misunderstandings, many countries are simply trying to move away from arms supplies to Ukraine without delving into the essence of the conflict.

In principle, formally, the supply of lethal weapons to Ukraine is not prohibited. To do this, there must be some sanctions, embargoes from the United Nations or individual organizations that would prohibit the supply of such weapons.

If a state violates any norms of international law, as was the case in Sudan, a ban is imposed on the state itself, if a conflict means a civil war, for example, in Zimbabwe, where the parties to the conflict are the government on the one hand and the armed groups on the other, an embargo is imposed on such groups [60].

Such an embargo was imposed on Ukraine in 2013 to prevent the violent dispersal of Euromaidan. Then the ban was lifted. That is, there are no formal restrictions today. But the fact that we refuse to recognize war as war does not play into Ukraine's hands. Some countries refer to the fact that we have incomprehensible civil war, and in order not to inflame that war further, we should not be supplied with weapons. Informally, Ukraine is still unable to obtain neither lethal weapons nor even industrial equipment

from most countries to increase the technological level of the Ukrainian defense-industrial complex [60].

The ice melted in late 2017, when US President Donald Trump approved the supply of M107A1 sniper systems to Ukraine - a lightweight modification of the famous long-range 12.7 mm Barrett sniper rifle, and Canada has included Ukraine in the so-called Automatic Checklist of countries where the supply of firearms is allowed. Ukraine has signed a contract with Canada for the supply of long-range LRT sniper rifles, and members of the Conservative Party of Canada have offered to transfer to Ukraine a consignment of small arms worth 9,5 million USD, which is a lethal weapon [61].

In 2018, the United States began delivering Javelin anti-tank missile systems to Ukraine, along with ammunition. Delivery of Javelin is still ongoing, the last delivery took place in October 2021. In addition, the United States transferred to Ukraine patrol boats such as Island and Mark VI, helping to restore the Navy.

The statement concerning Ukraine in October 2021 was made by Laura Cooper, Deputy Assistant to the Pentagon for Russia, Ukraine and Eurasia, at a conference of the Center for Strategic and International Studies in Washington. She called on all US allies to provide Ukraine with lethal weapons, as well as to unblock the possibility of its acquisition [61].

At the moment, the current level of conflict in the east allows us to deal with it without providing imported lethal weapons, but the concentration of the aggressor's troops on the border with Ukraine poses a constant threat of global conflict. Lethal weapons are needed to prevent an increase in the scale and intensity of hostilities by Russia, not separatists. This is a deterrent to the enemy: he sees that he will suffer great losses, and at the same time a means of preventing our losses if the global conflict in the East does begin.

In order to increase its defense capabilities, Ukraine first of all needs to import anti-tank, anti-aircraft equipment, sniper weapons, and mine action systems. We need vehicles, means of communication, means of electronic warfare and drones [60].

Mass purchases of weapons, ammunition and equipment from abroad for the first time in the history of independent Ukraine began in 2014. Every year the percentage of armed imports increases. The state defense order in 2020-2022 provides for the purchase of 90% of military equipment from Ukrainian suppliers, imports will account for about 10% [54].

Turkey, the United States, Great Britain, Poland and Bulgaria became the main suppliers. It is about ammunition, electronics, including electronic warfare stations, means of communication, sniper rifles and grenade launchers.

By 2018, only for the purchase of radio stations from the Turkish company Aselsan, about 100 million USD has been allocated. Also a batch of medium reconnaissance and strike drones Bayraktar TB2 (figure 3.3) was bought in Turkey for 69 million USD, 200 BMP-1AK and self-propelled artillery (SAU) 2C1 “Hvozdyka” were bought in Eastern Europe [54].



Figure 3.3 - Reconnaissance and strike drone Bayraktar TB2 [54]

As already mentioned, the United States has repeatedly provided missile systems FGM-148E as military assistance, which is one of the latest modifications (the most modern of the available versions) of anti-tank missiles complex “Javelin”, it is shown on the figure 3.4. This modification appeared in 2008, and was initially supplied only to the US Army, and since 2010 it has been purchased by other countries. Ukraine has been provided with 47 launchers and 360 “Javelin” missiles [62].

For comparison, in Estonia there are 80 launchers, in France 76, in Georgia 72, and in Lithuania 40. That is, we are already at the level of other European countries in terms of the number of “Javelins”. The cost of one complex complete with 6 missiles ranges from 600 thousand USD for the United States and its allies and up to 1,4 million USD for export [62].



Figure 3.4 - Missile system FGM-148 Javelin [62]

Since the beginning of Russia’s aggression against Ukraine, the United States has provided Ukraine with more than 2,5 billion USD assistance. As part of the assistance, 4 American patrol boats of the class “Island” were also provided, they are shown on the

figure 3.5, 2 were received in 2018, and 2 arrived in Odessa on November 23, 2021. One of the ships of this batch will bear the name of my hometown - “Sumy” [63].



Figure 3.5 - American patrol boats of the class “Island” [63]

A significant amount of ammunition is supplied to Ukraine from Lithuania, Bulgaria, Poland, and Montenegro. For example, the estimated cost of a tank shell is 500 USD, and one grenade for a hand-held anti-tank grenade launcher costs 200-300 USD [54].

3.4 Joint projects

As it was noted above, Ukraine generally does not have the necessary resources to fully develop its own high-tech weapons, and in many cases the technological level of Ukrainian enterprises does not allow it to do so with the latest military technology. The way out of this situation is joint projects [64].

Despite the war, foreign investors are providing significant funds for the development and modernization of weapons, for example, for the money of Saudi Arabia, a large amount of work was carried out on the missile system “Hrim-2”. The modernization of the ZRK S-125 took place with the use of funds from Ethiopia.

Cooperation with foreign investors allows the development of models for the armament of the army, while all developments remain the intellectual property of Ukrainian companies [65; 66]. There are many striking examples of such cooperation.

The development of the active, semi-active and passive homing warheads for “ground-to-air”, “air-to-air” and “air-to-ground” missiles by the “Radionix” research and production enterprise has raised the domestic defense-industrial complex to a new level in this direction.

Special mention should be made of cooperation in the military sphere with our neighbor, Turkey. Ukraine has been buying “Bayraktar” strike drones (model Bayraktar TB2) from Turkey since 2019. In the conditions of modern war they have shown high efficiency - in particular in the Armenian-Azerbaijani conflict in Nagorno Karabas.

Ukraine and Turkey have recently signed agreements on joint production of these unmanned aerial vehicles (UAVs). One of the options for their equipment is the use of Ukrainian engines, which are already supplied to Turkey, and Ukrainian missiles as weapons. The first use of this UAV in the Donbass took place on April 10, 2021, and on October 28, 2021 Bayraktar destroyed the separatist howitzer. Of course, this provoked another outrage of the Kremlin, but at the same time it showed the effectiveness of the new Ukrainian weapons [67].

The annexation of Crimea led to the loss of most of Ukraine’s warships. Since then, the Ukrainian armed forces have been building a “mosquito fleet” - missile boats, as well as looking for opportunities to buy ships from Western partners.

The Ukrainian-Turkish agreements provide for joint production of ADA-class corvettes with Turkey. A corvette is the most common type of light warship, which can have different types of weapons: for anti-submarine, anti-ship and air defense. The first

corvette will be made in Turkey, and further they will be made jointly, at the shipyard “Okean” in Mykolaiv. Moreover, Ukraine and Turkey are discussing joint production of the Ukrainian An-178 military transport aircraft at the facilities of the “Antonov” enterprise [67].

On June 21, 2021, aboard the Royal Navy’s HMS DEFENDER missile destroyer in Odessa, the Minister for Defense Procurement of the United Kingdom Jeremy Quin and the Deputy Minister of Defense of Ukraine Oleksandr Myronyuk signed a Memorandum on the implementation of maritime partnership projects between the industry consortium of the United Kingdom and the Ukrainian Navy, which provides for the joint design and construction of warships in Ukraine and the United Kingdom, as well as the construction of two Ukrainian naval bases [68].

I hope that this is only a part of joint military projects of Ukraine with the leading countries of the world in technical ensuring of its own security and increase of export potential at the expense of weapons, because in the military sphere not all projects reach the media.

An important component of modernization and support of its own defense industry, both for developing countries and for the world’s leading economies, is the use of offset agreements for arms imports, the condition of which is to set counter-requirements for investing part or even the entire contract amount in the economy of importing country. And there are plenty of examples of such cooperation:

- Saudi Arabia, during the purchase of three frigates worth 18 billion francs in France in 1989, put forward a condition of reinvesting of 35% of the contract value in the economy of the importer;

- Norway’s purchase of five frigates worth 2 billion USD from the American world’s leading arms supply company “Lockheed Martin” and Spain’s “Empresa Nacional Bazan” in 2000 took place under the condition of reinvesting in the Norwegian economy of 100% of the contract value within ten years;

- in 2020, Italy signed a contract to build a new generation FFG frigate for the US Navy, and undertook to build a series of 20 ships not in Italy but in the US, which means creating jobs for Americans and settling much of the money spent in the US economy [69];

- India and Turkey, when concluding arms import agreements, in most cases require the transfer of technology of purchased weapons and the establishment of joint ventures to service and manufacture such equipment. For example, India's purchase of AH-64 Apache combat helicopters in the United States provided for the creation of a joint venture with the American company Boeing for the production of spare parts.

By the way, the future terms of contracts for the construction of frigates by the United Kingdom for Ukraine, according to preliminary information, should provide for the possibility of their construction at Ukrainian shipyards [69].

3.5 The role of private enterprises in the defense-industrial complex of Ukraine

For decades, the Ukrainian defense-industrial complex remained part of the Soviet system, where there were no private enterprises neither in the production nor in maintenance of military equipment. Private companies could not enter foreign arms markets because all trade in arms and military services remained the prerogative of the state.

Everything changed in the spring of 2014. The army urgently needed a lot of weapons, services, military machinery and equipment. "Ukroboronprom" could not meet all the needs of the army, so some niches in the arms market began to be filled by private enterprises. At the same time, in 2014, the licensing of the production of defense products and dual-use products was revoked.

In 2015, companies with private capital accounted for 23% of all government defense orders. At the end of 2020, this figure increased significantly - to 54%, as shown on figure 3.6 [70].

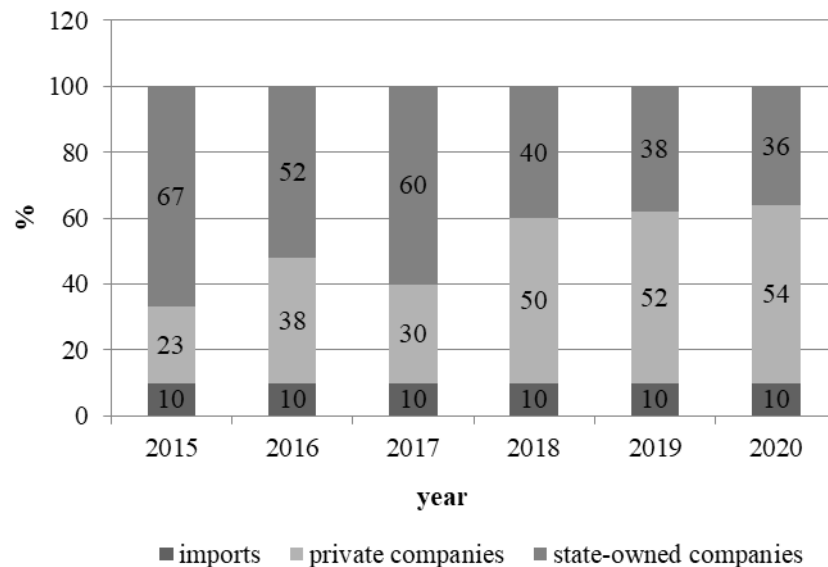


Figure 3.6 - The share of private companies in the state defense order in Ukraine [70]

Accordingly, the share of “Ukroboronprom” decreased. Ideas in the private sector are being implemented much more dynamically than in the public sector, so the growth of the share of private companies in the structure of the state defense order looks logical. Development of one sample of military equipment costs a private enterprise from 500 thousand USD up to 1,5 million USD [70].

The advantages of private enterprises include:

- ability to respond quickly to customer needs and quickly fulfill orders;
- interest in the end result for the possibility of further receipt of orders;
- minimization of the management staff;
- production areas can be minimized;
- the absence of a corruption component within the enterprise.

There are different types of origin of private companies:

- civilian firms in related industries began working in the interests of defense;
- volunteer projects became enterprises and received government orders;
- the company was purposefully created for the production of weapons [70].

The first way is clearly demonstrated by the Research and Production Association “Praktika”, which since 1993 has been producing technical means of security for banks, offices and collection vehicles, and at the beginning of the war it began to create armored jeeps and then - full-fledged armored vehicles. In 2020, “Praktika” in the framework of the state defense order handed over to the Armed Forces of Ukraine more than 40 armored vehicles “Kozak-2”!

Research and Production Enterprise “Athlon Avia” has grown from an aviation club. Now Ukroboronprom may envy its turnover. In 2017-2019, the annual revenue of “Athlon Avia” amounted to UAH 50-85 million!

In 2014, Ukraine was forced to abandon the drones developed in the USSR, as modern systems of air defense and electronic warfare of the enemy could easily destroy them. Already in the summer of 2014, “Athlon Avia” conducted the first tests of the possibility of using its own unmanned aerial vehicle A1-C, which was later called “Furia”, and the Ministry of Defense approved the possibility of using it to perform a number of tasks. Since 2014, the company has delivered more than 100 “Furia” as part of a state defense order. In addition, the company has developed a barrage ammunition ST-35 “Silent Thunder” and a kamikaze drone.

A good example of responding to growing demand is Design and Manufacturing Company “Ukrainian Armor”, which until 2012 was called “Ukrglavpak” and produced packaging film, but met the beginning of the war in an inactive state. “Ukrainian Armor” delivered to the Armed Forces of Ukraine 200 units of specialized armored vehicles (SAV) “Varta” and more than 70 units of SAV “Novator”. 300 UPIK-82 mortars were also put into service. In 2019, the company’s turnover reached 1,5 billion UAH [70]!

“Radionix” manufactures and maintains radar systems and electronic equipment. The company’s products include: “Esmeralda” radar for medium-range anti-aircraft missile systems and fighter aircraft; active homing heads for missiles, “Omut-KM” system for protection of Su-24 aircraft from anti-aircraft missiles; suspension system for the same Su-24.

Holding Company “Ukrspetstechnika” was established on the basis of the State Research and Production Enterprise “Ukrspetstechnika” privatized in 1998. Among company’s products are: radar combat complexes against unmanned aerial vehicles (UAVs) “Anklav” and “Polonez”, radars “Biskvit-KB”, portable stations for detection of people and vehicles “Borsuk”, stationary stations for detection of vehicles “Lys” and radar stations for detection of air and surface targets “Malachite-M”.

Research and Production Company “Interproinvest” develops and manufactures small arms, assault rifle “Vulcan” (“Malyuk”), “Harpy” grenade launchers, “RIFF” anti-drone systems, demining equipment, and silent rifle “Shepit”.

LLC “Ukrop” produces sniper rifles UAR-10 and UAR-008 with cartridges of NATO standard 7.62x51 mm; GMS-15 submachine gun caliber 9x19 mm.

“Ukrspesystems” develops and manufactures unmanned aerial vehicles: PD-1 and PC-1.

Scientific-Production Company “Techimpex” repairs and modernizes a wide range of military equipment - from armored personnel carriers (APC) to naval torpedoes, produces machine guns KT-7.62, 8x8 “Varan” APC, tracked APC “Plavets”, light tactical cars 4x2 and 4x4.

“Tritel” produces means of special communication and protection of information [70].

Among the private companies of the defense-industrial complex of Ukraine, in 2020 PJSC “Motor Sich” took the first place in terms of revenue, having earned 422,2 million USD. The second place was taken by PJSC “Kuznya na Rybalskomu” with

revenue 35,8 million USD. PJSC “Fed” had revenue of 32,3 million USD and took third place, as shown on figure 3.7 [42].

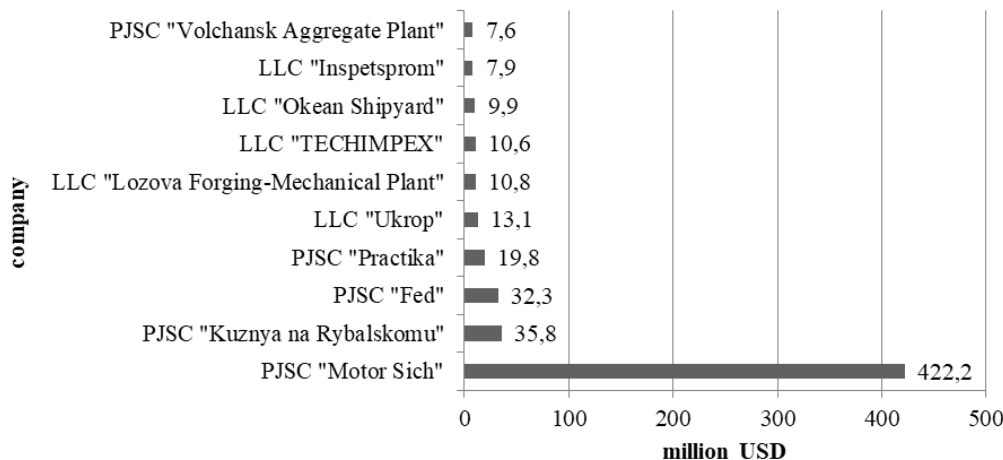


Figure 3.7 - Top 10 Ukrainian private companies producing military products in 2020, in terms of income [42]

Private companies tend to operate in narrow segments of the wide range of military-technical products, needed by the army, as they have very limited access to information about the needs and programs of the army’s rearmament. In their activities, they encounter the following problems:

- they do not always understand what the military needs;
- there is no mechanism of state support. A state-owned company can receive funds from the budget to develop a sample, a private company cannot. However, in the United States and most NATO countries, such support programs also work for private companies;
- the legislation lags behind the situation in the defense-industrial complex;
- in many cases, a product developed by a private enterprise at its own expense and put into service, is not purchased under a state order [70].

As a result, most private companies began to focus on the foreign market. As we saw in the first chapter, the demand for weapons in the world is always there and it is growing. But here, not everything is simple, because until July 2019, private companies had to use the services of a state monopolist-intermediary “Ukrspecexport”. In addition, his services were paid. In July 2019, “Ukrspetstechnika”, “Ukrspesystems” and “Interproinvest” received the right from the government to export their products independently. Later they were joined by “Radionix”, “Ukrainian Armor”, “Practika”, “Tactical Systems” and “Defense Technologies”.

These are the companies that have managed to overcome the routine of the bureaucratic system. The granting of export and import licenses for military goods by the State Export Control Service should be more democratic and transparent. Ukrainian enterprises are losing the opportunity to freely enter foreign markets. Due to the bureaucracy in the export control system, the state budget loses 1-2 billion USD annually, and the private sector, which today represents a half of the Ukrainian defense-industrial complex, loses the opportunities for rapid development, which is so necessary for our state today [70].

CONCLUSIONS

Ukraine is an active consumer and exporter of weapons, which is why our country needs to constantly improve its position in the international arms market, which, by the way, unlike most markets suffering from the COVID-19 pandemic, is constantly growing amid growing political tensions and threats of military conflicts, driven mostly by economic competition for resources and markets. The conflict on the territory of Ukraine and the potential threat on the borders of our state play not the least role in these processes.

The country with the highest military spending, as always, is a strategic partner of Ukraine - the United States. The main volume of expenditures on the international arms market falls on economically developed democracies, the strategic strengthening of which gives hope as for further strengthening of international security and growth of stability in economic markets, as for the possibility of ensuring the sovereignty and territorial integrity of Ukraine through political pressure on the aggressor state. At the same time, the growing military power of countries with authoritarian and totalitarian regimes (Russia, North Korea) is provoking chaos in the world economy and international politics. China's significant military spending, in my opinion, is also not a positive signal given the persistent resource shortages in this country.

For the leadership of most industrialized countries, their own defense-industrial complex is an important part of the country's national security and defense strategy. Considerable attention is paid to the development and support of enterprises and organizations of the defense industry. Significant financial, technical and technological resources are concentrated on this.

The current situation in the defense-industrial complex of Ukraine is characterized by significant deterioration of the material and technical base of research and production structures, the lack of modern scientific and technological developments, a serious

rupture in relations between science and industry. The creation of innovative products ends at the initial stages of the innovation cycle and is not brought to mass production.

The situation is complicated by the loss of relevance of a number of basic technologies in the defense industry, limited closed production cycles, reducing the range of products, especially electronic equipment; low level of quality of components and materials, unreasonably high level of their cost.

The destruction of the defense-industrial complex leads to severe limitations of opportunities to ensure the combat readiness of the Armed Forces of Ukraine and a significant reduction of Ukraine's opportunities for integration into defense, economic and political international structures. The chance for Ukrainian gunsmiths is the American sanctions that Washington regularly imposes on the Russian defense-industrial complex.

Ukrainian companies can gain a foothold in the global arms market and find new niches for exports to countries where the purchase of Russian weapons is impossible for political reasons, and Western - for financial reasons. There are some areas where Ukraine can compete with Russia or Eastern Europe. Everything will depend on the efficiency of Ukroboronprom top managers and private initiative, as small companies have been given the opportunity to enter foreign markets without total control by the state monopolist.

The main problem of the Armed Forces of Ukraine, and as a consequence the problem of the defense-industrial complex - lack of funding, and given the situation in the Ukrainian economy, this problem with the Ukrainian army is for a long time. At present, and apparently in the near future, the Armed Forces of Ukraine are mostly staffed with military equipment that came to Ukraine after the collapse of the Soviet Union. Its condition is characterized as critical. More than 65% of armaments are morally and physically obsolete and in terms of their tactical-technical and combat characteristics do not meet the criteria of modern means of armed struggle. The main

areas of maintaining them in combat readiness are the gradual modernization and timely repairs.

To implement the defense-industrial policy in the field of rearmament and maintaining the Armed Forces of Ukraine in combat readiness, the relevant state authorities have developed and implemented a whole set of organizational, structural and legal measures aimed at increasing the potential of the Ukrainian army, but without a significant increase in funding, these are just words on paper.

In the structure of expenditures of the security and defense sector in the draft budget for 2022, provides for an increase in total expenditures by 19,5% (from 267,3 to 319,4 billion UAH) compared to 2021, at the same time expenditures for the Ministry of Defense will grow much less - only by 11,5%. The situation is similar in the comparison of the budgets of 2021 and 2020. In 2019, Ukraine ranked 35th among the top countries in the world in terms of military expenditures, moving to 34th in 2020.

Insufficient funding and lack of significant prospects in this matter suggest the need to reduce (optimize) the army, which can free up money for rearmament and make the army more efficient. And this is not about reducing the number of soldiers who are able to give an adequate military response to the enemy. This is about an anachronistic bureaucratic mechanism that the Ukrainian army inherited from the USSR.

Of course, 250 000 hats, which is exactly the number of the Ukrainian army provided by military doctrine, are very serious weapons, but the recent confrontation in Nagorno-Karabakh is a strong argument that the time to fight with hats is long gone! The Nagorno-Karabakh conflict has shown that the models of the latest weapons are really changing the balance of power in the theater of military actions.

Ukrainian arms exports have fallen dramatically in recent years. And the explanation for this is not only in the reduction of sales of Soviet weapons from the reserves “eaten” by the war, but also in the transition of the world’s leading countries to more technological weapons. Today, the world’s leading manufacturers of military equipment are working on the possibility of practical application of combat robots,

artificial intelligence, directional energy (laser, accelerating and ultrahigh-frequency), kinetic (rail electromagnetic gun, coaxial electromagnetic and electrothermal gun), acoustic (infrasonic), geophysical and genetic weapons, etc. Unfortunately, for the domestic defense-industrial complex, these areas are still on the verge of fantasy.

Despite the lack of funding for the army, Ukraine informally still have difficulties with the import of lethal weapons and industrial equipment for improving the technological level of the defense industry. These issues are rather diplomatic and political. The United States is providing significant assistance to Ukraine in this regard, calling on all its allies to provide Ukraine with lethal weapons and to enable our country to purchase them.

At the moment, the current level of conflict in the east allows us to deal with it without the provision of imported lethal weapons, but the concentration of the aggressor's troops on the border with Ukraine poses a constant threat of global conflict. Imported high-tech lethal weapons are needed to prevent an increase in the scale and intensity of hostilities on the part of the Russian Federation.

In order to increase its defense capability, Ukraine first of all needs to import anti-tank, anti-aircraft equipment, sniper weapons, anti-mine systems, air and ship defense equipment. We need vehicles, communication facilities, means of electronic warfare, drones.

The state defense order in 2020-2022 envisages the purchase of 90% of military equipment from Ukrainian suppliers, and imports will amount to about 10%. Today, Turkey, the United States, Great Britain, Poland and Bulgaria have become the main suppliers of imported weapons to Ukraine. Invaluable achievements for the army were the purchase of medium-range Bayraktar TB2 reconnaissance and strike drones from Turkey and providing by the United States as military assistance missile systems FGM-148E "Javelin" and patrol boats class "Island".

Ukraine generally does not have the necessary resources to fully develop its own high-tech weapons, and in many cases the technological level of Ukrainian enterprises

does not allow it to do so with the latest military technology. The way out of this situation is joint projects with other countries. Besides, an important component of modernization and support of own defense-industrial complex, both for developing countries and for the world's leading economies, is the use of offset agreements for arms imports, the condition of which is to set counter-requirements for investing part or even the entire amount of the contract in the economy of the importing country.

Private companies are beginning to occupy a significant share of the arms market in Ukraine, and this is not hindered by the lack of state investment support or systemic bureaucratic barriers to licensing these activities. In most highly developed countries, the private sector is the backbone of the defense industry. At the same time, the state usually provides private companies with significant support. The main thing is that our private arms manufacturers do not become a feeder for the corrupt in power, and state orders are issued not on the principle of nepotism and family relations, but based on the competitive principles and interests of our state.

Despite the complexity of the situation, Ukraine's integration into the international arms market is happening in all directions and we hope for positive prospects.

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ANNEXES

Annex A

SUMMARY

Makarenko T. Y. Ukraine's integration into the world arms market. - Masters-level Qualification Thesis. Sumy State University, Sumy, 2021.

The master's thesis focuses on the prospects of Ukraine's integration into the world arms market. The main aim of this research is to develop proposals for the implementation and development of the potential of the defense-industrial complex of Ukraine to provide both its own armed forces and achieve the highest possible level of arms exports.

Keywords: world arms market, military equipment, export potential, arms imports, defense-industrial complex.

АНОТАЦІЯ

Макаренко Т. Ю. Інтеграція України до світового ринку зброї. – Кваліфікаційна магістерська робота. Сумський державний університет, Суми, 2021 р.

У роботі досліджено перспективи інтеграції України до світового ринку озброєнь. Основною метою цього дослідження є розробка пропозицій щодо реалізації та розвитку потенціалу оборонно-промислового комплексу України для забезпечення як власних збройних сил так і досягнення максимально можливого рівня експорту зброї.

Ключові слова: міжнародний ринок зброї, військова техніка, експортний потенціал, імпорт озброєнь, оборонно-промисловий комплекс.

Annex B

Abstracting foreign literary sources

1. SIPRI Yearbook 2021. Armaments, disarmament and international security. Stockholm International Peace Research Institute. Oxford: Oxford University Press, 2021.

This publication is an integration of world information on the arms trade. Founded in 1966, the Stockholm International Peace Research Institute (SIPRI) is a widely recognized and the most authoritative source of data on the international arms trade, researching conflicts, armaments, arms control and disarmament. It is an independent database based on open sources for the world community, politicians, researchers, the media, and the public.

The Stockholm International Peace Research Institute's Arms Transfer Database is the basis for controlling the spread of weapons around the world, containing detailed, high-quality and reliable information on international arms transfers from a variety of sources: official reports from the government, companies, the media and even sources such as photos of military parades.

The yearbook covers almost the entire spectrum of information related to weapons and international security, as evidenced by the main sections of the publication:

- international stability and human security;
- armed conflicts and their settlement;
- peacekeeping operations and conflict resolution;
- military expenditures and armaments;
- international arms supplies and events in the field of their production;
- transparency of arms supplies;
- arms production and military services;

- world nuclear powers;
- non-proliferation, arms control and disarmament;
- chemical and biological safety threats;
- global tools for conventional arms control;
- control over trade in dual-use goods and weapons;
- arms control and disarmament agreements;
- international organizations, cooperation in the field of security.

The publication includes the world's best independent leading experts in the field of weapons, disarmament, peacekeeping, namely:

- Board of SIPRI: ambassador Jan Eliasson, Chairman of the Board, Sweden; Dr. Dewi Fortuna Anwar, Indonesia; Dr. Vladimir Baranovsky, Russia; Espen Barth Eide, Norway; Jean-Marie Guéhenno, France; Dr. Radha Kumar, India; Dr. Patricia Lewis, Ireland/Great Britain; Dr. Jessica Tuchman Mathews, USA.

- Director of the Institute - Dan Smith, Great Britain.

- Editorial office: Editor-in-Chief of the Yearbook - Dr. Ian Davis; Executive Editor - Joey M. Fox; editors: John Batho, Frank Esparraga, Andrew Mash, Annika Salisbury.

- In addition to the above-mentioned specialists Marina Caparini, Jose Alvarado Cobar, Neil Melvin, Jair Van Der Lane, Timo Smith, Nan Tian, Alexandra Kuimova, Peter D. Weseman, Simon T. Weseman, Diego Lopez da Silva, Ode Flora, Mark Bromley, Kittery de Labby, Hans M. Christensen, Shannon N. Kyle, Tutti Erastio, Ugne Komzajte, Catriona McLeish, Philippa Landzos, Vincent Bulanin, Mike Verbruchen, Sybil Bauer, Eneken Tick, Kolya Brockmann and Giovanna Maletta joined the work.

As we can see, the transnational publication has no less transnational team of authors. The key spirit of the publication is not weapons, but disarmament, international stability and security, and the settlement of armed conflicts.

2. Feinstein A. The shadow world: inside the global arms trade. London: Hamish Hamilton, 2011. 672 pp.

This publication opens the eyes of the world to the behind-the-scenes history of the global arms trade, a deadly conspiracy between arms manufacturers, high-ranking politicians, arms dealers and the dirty military.

Andrew Feinstein shows situations that threaten world security and democracy. The book provides information on a number of hidden corruption deals with weapons, including the largest deals in history - between Great Britain and Saudi Arabia, the US arms deal with Saudi Arabia for 60 billion USD, a deal to buy diamonds in Africa. We are faced with the whole octopus of the shadow world of the illegal arms trade. The author of the work was once a member of the African National Congress, which resigned when the anti-corruption authorities of the relevant countries have refused to investigate corruption in a large arms supply deal in South Africa. This octopus has an impact on conflicts around the world, as well as on the democratic institutions of the world's leading democracies - the United States and Great Britain.

The author of "The shadow world" access to top-secret information and key players in the chaos of blood money reveals the dangerous nature and huge financial flows, with a corruption component that has been, is and will be in the future.

3. Stohl R., Grillot S. The international arms trade, 1st edition. New Jersey: Wiley, 2013. 280 pp.

Almost every country in the world is involved in the multibillion-dollar business of the international arms trade, which can irreversibly change people's lives, from a small African village in the jungles of Africa or the Amazon to all of humanity. These weapons are the deadly threat to millions and the deaths of hundreds of thousands of people each year.

The book examines the complexities and realities of the global arms trade. The publication “International Arms Trade” is full of specific and diverse statistical information on both trade and the consequences of the use of these weapons. The authors trace the development of the history of the arms trade after the end of the Cold War. Much attention is paid to world leaders in arms exports and imports, arms dealers, as well as gray and black trade schemes giving overprofits in this deadly race for profit. Much attention is paid to the devastating impact of business on countries, societies and individuals, and to the evaluation of the various existing strategies and capabilities for arms control.

The book “International Arms Trade” can be a basis for studying international relations and security in this sphere of vital activity, for students, leading politicians, and anyone interested in understanding the international arms trade market.

4. Tan A. T. H. The global arms trade: a handbook. London: Routledge, 2010. 416 pp.

The authors of the book are a group of security experts from around the world who are analyzing global terrorism since the 2011 attack on the International Trade Center in the United States. The access of terrorist groups to weapons is a threat to the existing level of world security and the development of democracy. At the same time, the significant level of terrorist financing and the existence of non-transparent schemes on the world arms market do not give optimism in solving this problem in the future. The book contains a clear description and analysis of supply and demand for modern weapons systems. The saturation of statistical information allows using this book as a standard guide to the international arms market.

The publication develops the general conceptual basis of the global arms trade, pays considerable attention to the modernization of weapons after the Cold War and the demand for weapons, defense spending, procurement and modernization of military equipment. The military-industrial complex of the world's leading countries occupies a

significant amount of work, the development of the arms supply system, the arms industry, their problems and prospects are studied.

At the same time, much attention is paid to the place of the arms race as a driver of scientific and technological development of mankind. Sufficient attention is paid to such regions of the world as Asia, Europe and the Middle East.

The book will be an invaluable legacy for scientists involved in the international arms market and security research, political analysts and experts in this field of human activity.