

Evaluation of the Romanian Defense Industry

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Abstract

The main aim of this article is to carry out a comprehensive evaluation of the Romanian Defense Industry and to identify the main solutions for the development of this strategic sector, as well as to identify the most attractive markets in terms of economic viability and investments made in defense sector. To give scientific consistency to the article, the analysis will focus on Romania's situation, to identify the main markets that are attractive to the domestic industry, as well as setting up recommendations for Romanian companies and responsible authorities to develop this strategic domain.

The data used in the article is retrieved from the Stockholm International for Peace Research Institute (SIPRI) – www.sipri.org, an independent organization that collects data and information on the defense industry from various states and provides relevant analyses on international arms market developments. Data on exports of military products made by Romania are collected from the website of the ANCEX Control Department under the Ministry of Foreign Affairs (www.ancex.ro). Also, all data used in this material are reported in 2019, the last year available with relevant data regarding defense industry from open sources.

Keywords: exports, arms, defense industry, GDP, investment

1. Introduction

The defense industry is one of the most profitable economic branches worldwide, with the benefits obtained being consistent and contributes an important part to a state's Gross Domestic Product (GDP). For this reason, economically developed states carry out national programs supporting the defense industry in order to develop it on a sound and scientific basis.

At the same time, the defense industry is an essential element for defending national security, and states that lack their own industry import military equipment from the international market, which is currently dominated by companies very strong turnover stakes of the order of billions of USD.

Nowadays, the requirements of the defense industry must take into consideration the hybrid war, concept introduced and used with success by Valery Gherasimov, Head of General Staff of the Russian Federation Army. Hybrid war was used by the Russian Armed Forces during the conflict with Ukraine who conduct at illegal annexation of Crimea Peninsula by the Russian Federation.

In this regard, NATO and Romania should consider the steady increasing of the Russian military force in the Black Sea following the illegal annexation of Crimea Peninsula. Moscow plans to build 30 warships for the Black Sea fleet until 2025, the financial burden being estimated at more than \$2 billion. Air forces have been deployed in Crimea to test more often the responsiveness of NATO states, and missile systems capable of hitting targets in Romania, Bulgaria or Turkey have been installed.

The main purpose of this article is to apply methods that allows the development of the Romanian defense industry, by analyzing foreign arms markets, to identify areas of interest for Romanian arms exports. These analytical methods are useful for the managers of companies in the defense industry, its correct application allowing them to adopt the right decisions regarding the adaptation of the company's commercial policies to maximize operational profits and sustainable growth of the company.

2. Literature Review

Starting 2017, Romania has committed to spend at least 2.0% of GDP on defense through 2027. The increased spending

level offers a clear opportunity for foreign defense equipment and service providers. Romania is also looking to modernize its own defense industry through international partnerships.

At present, Romanian MOD is considering the first option for the acquisition procedures. International firms may be asked to contribute to this goal on volunteer base under the offset law for all commercial contracts over 2 million EUR (around 2.2 million USD). In the last years, it was invoked the national security interest, basically security of supply, as a mandatory criterion for awarding contracts and in these cases the industrial cooperation or offset obligations are defined from the beginning.

Due to the significant government changes in February 2020, the Government of Romania is evaluating the needs of the military and is assessing military personnel and previously tendered procurement and projects. In this regard, the Government of Romania declared the defense industry is undergoing changes so Romarm Company, economic organization detained by the Romanian Ministry of Economy, will become a separate company, with all the other subsidiaries free to work.

These steps by the Romanian authorities are being carried out to effectively counter the hostile actions of the Russian Federation in the Extended Black Sea Region. In this context, it is necessary to carefully consider the military capabilities of the Russian Federation in the area to adapt the procurement program of the Romanian Armed Forces to counter these risks.

“Russian history is best understood as the process of adaptation to (relative) backwardness and perceived external threats” (Allison, 2003). Out of a sense of insecurity and vulnerability, the elite mobilizes all natural and human resources for the purpose of combatting real and imagined foreign and domestic threats. (Kanet, 2019)

Russia is building a technologically advanced network of A2/AD (anti-access, area denial) capabilities aimed at blocking the access of NATO forces in the Black Sea area and increasing the relevance of the Russian military in the Eastern Mediterranean. In the context of Russian military intervention in Syria, the Black Sea fleet has become of greater importance for Russian expeditionary operations in Eastern Mediterranean. Russia's secular quest for getting access to the warm seas is supported by Kremlin with considerable resources, while the Crimean military infrastructure is vital for providing logistical support to the Tartus base, in Syria. The response to these developments can only be credible deterrence, as demonstrated by the rapid response capability, precise and almost 100% fatal for unexpected threats, either hybrid or conventional, but "disguised" in asymmetric or cyber-attacks. (The New Strategy Center, 2016).

Under Defense Minister of the Russian Federation, Sergey Shoigu, defense budget planning stabilized, but the increase in nominal budget expenditures on national defense continued. In terms of the absolute amount of military spending and its share of global military spending, Russia has risen to third place in the world (ranking behind the USA and China), and in terms of military spending as a share of GDP it also ranks third behind Saudi Arabia and the United Arab Emirates. (Balashov, 2016)

Also, according to estimates and analyses by the international community of economic analysts, the medical crisis generated by the Covid-19 pandemic will induce a major global economic and financial crisis which, in conjunction with the current geopolitical situation, characterized by a high degree of uncertainty (e.g. the strategic economic confrontation between the US and China, the position of force adopted by the Russian Federation), will affect production and supply chains, will amplify the phenomenon of the adoption of trade policies of a protectionist nature and, indirectly, will significantly affect national defense budgets.

Andrei Frolov, a military expert at the Valdai Club, said that "we can say that in 2020 the global defense industry faced its biggest crisis since the end of the Second World War, which is not yet over. How we get out of it will depend on whether a second wave of coronavirus arrives and related measures are taken, as well as the state of the world's economies, which, as a result of this year's depression, could significantly reduce defense spending over the next two to three years."

In this fluid geopolitical context, characterized by insecurity and systemic instability, a strategic rethinking and recalibration of defense policies can be predicted in a new context, defined by the multipolar competition and the asymmetry of geopolitical geometry, the conflict between civilizational models (competition between democracy vs. autocratic/totalitarian political regimes), to the detriment of regional and international collective security arrangements.

3. Method

What this method brings is the way in which the calculation formulae are made on the attractiveness of the markets and the degree of compatibility of the markets vis-a-vis the target market covered by that study, in this case the market Romanian defense. Predictive analytical methods (e.g. SWOT, statistical analysis) were also used to identify dysfunctions in the Romanian defense industry and to find the best solutions for solving them.

For the international arms market is important to use the existing database at the level of SIPRI, a non-governmental organization with relevant experience in collecting data from official databases, and for Romanian arms exports were used official documents published on its website by the national export control authority in Romania, respectively the Ministry of Foreign Affairs - ANCEX Control Department.

A first factor to be considered is the percentage allocated by each state in the domestic defense industry, relative to GDP. This is very important because it is the importance of that State to national defense, which is important when considering the potential of a state for the absorption of defense products.

Usually, states that allocate a large percentage of GDP feel threatened by neighboring states or come from geopolitically or geostrategic complicated areas faced with remnant or potential conflicts. At present, such a region is the Middle East area, where certain conflicts (e.g. Syria) are ongoing, or there are dormant tensions (e.g. Saudi Arabia – Iran, Israel – Palestine, Israel – Iran) that can degenerate into active conflicts.

Another factor correlated with it is the net amount allocated to the defense industry, which reveals much more accurately the real capacity of that state's defense industry, as well as the level of endowment of its own army. For example, the first percentage of GDP allocated to the defense industry is Saudi Arabia with 8.8% of GDP, but at the net allocation in first place is occupied by the US with 698,798 million dollars (3.2% of GDP, 18th), followed by China with 249.997 million USD (1.9% of GDP, 56th), and in third place is Saudi Arabia with 67.555 million USD. We will write down the place occupied in the GDP allocation ranking for defense with R_{GDP} , and the place occupied as a result of the actual allocation with R_{USD} .

The following ranking is met by the assembly of the three states: Saudi Arabia (4 points), the USA (19 points), and China would get 58 points. Although such a classification is relative, it achieves a relative ranking of investment potential, in the sense that the desire for investment in defense is combined with investment potential in the defense industry.

In this case, the following calculation formula applies: $R_{final} = R_{GDP} + R_{USD}$.

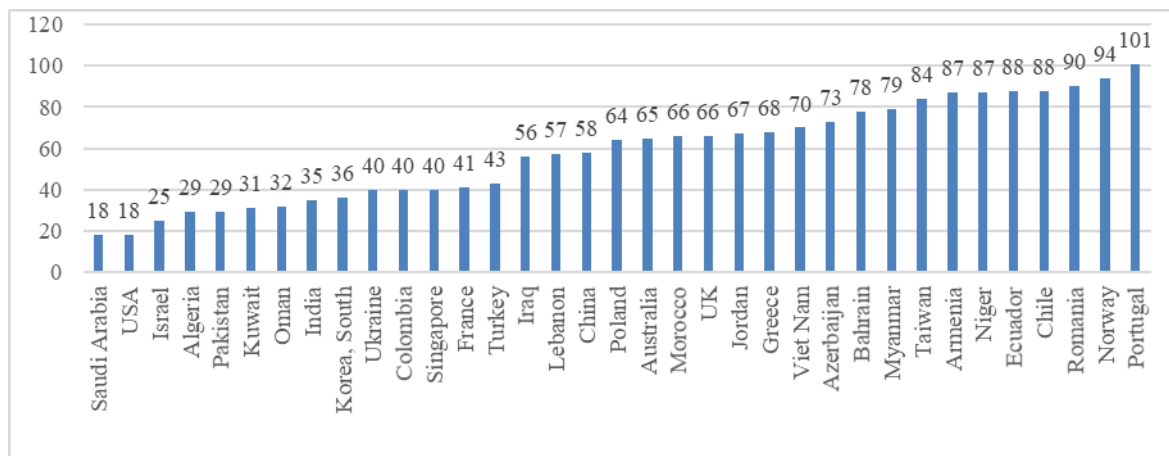


Figure 1. Most attractive countries for arms exports

(Data provided by SIPRI, processed by the author)

It follows from the data analysis that many states are in the Middle East and Asia area, with these areas having a relevant development potential in the coming period. As is noted, Romania ranks 34th in this ranking of the most tempting states in terms of investment. Romania has allocated about 2% of GDP for defense, and in real amount it represents USD 4.609 million. Although the allocation from GDP can be considered consistent, Black Sea countries invest much more in defense, such as Turkey, Ukraine, but there are also central European countries, such as Poland, or the Mediterranean (e.g. Greece).

Another important indicator is the distribution of the world's 100 main producers, of whom 49% are from the US, 10% from the Russian Federation and 6% in Japan and France, respectively. This highlights the main countries with technically advanced technologies, and which also represent the world's leading exporters. It should be noted that this statistic did not consider China, which did not publish data on the financial results of its own defense industry companies.

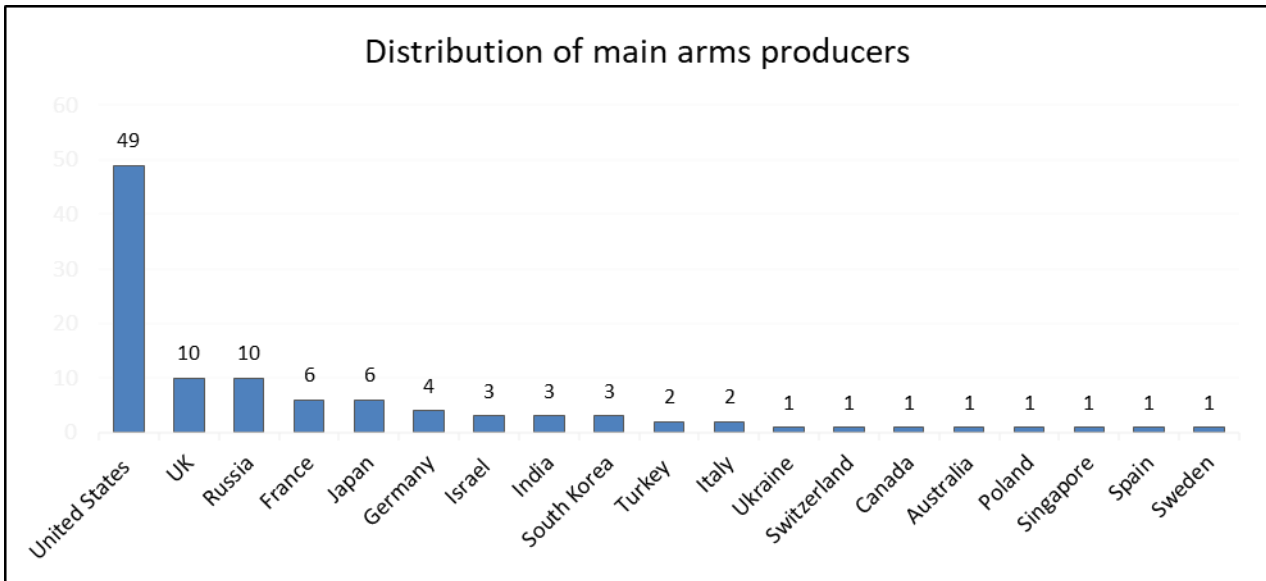


Figure 2. Distribution of biggest companies producing military items

(Data provided by SIPRI, processed by the author)

This coefficient (α) indicates an important multiplication factor representing the number of companies in each individual State. This multiplication factor is added to the previous formula, resulting in the following formula:

$$R = \alpha * R_{final} = \alpha * (R_{GDP} + R_{USD})$$

For companies that do not have companies in the top 100 companies in the global defense industry, α coefficient is the number of companies in the top 100.

This formula must be applied to analyze Romania's current situation on the global arms market, in the sense that the supply of products made by the domestic industry must be assessed, depending on demand on the world market.

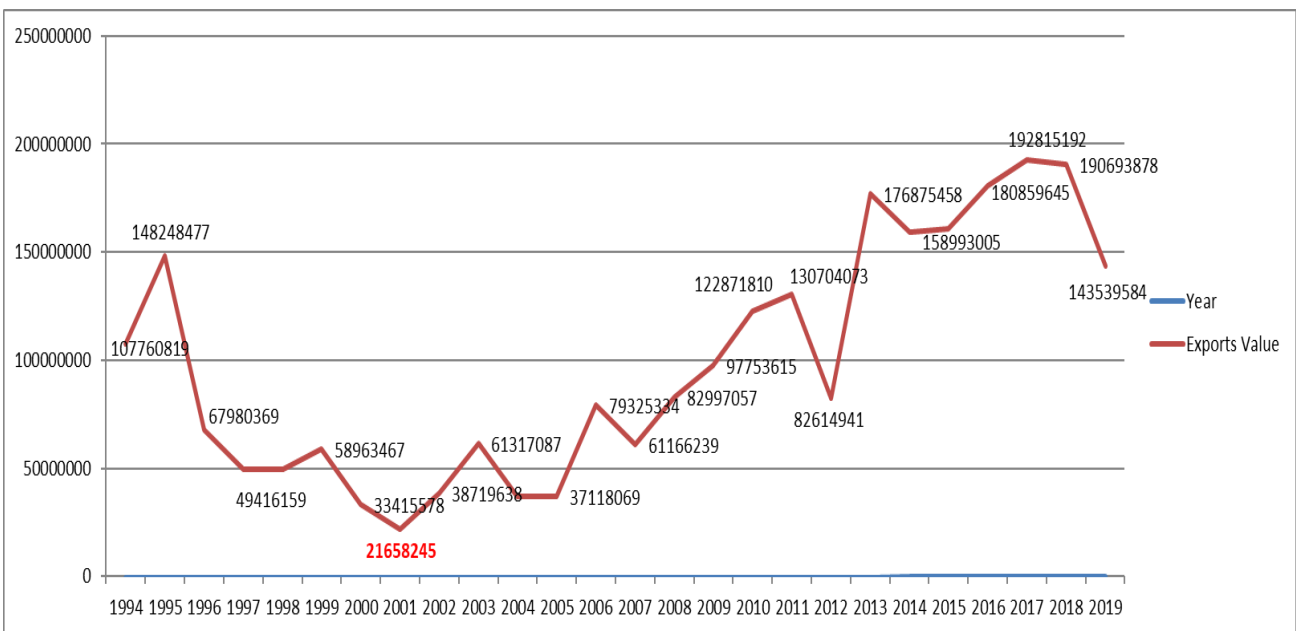


Figure 3. Evolution of the Romanian military exports (EURO)

(Data provided by ANCEX, processed by the author)

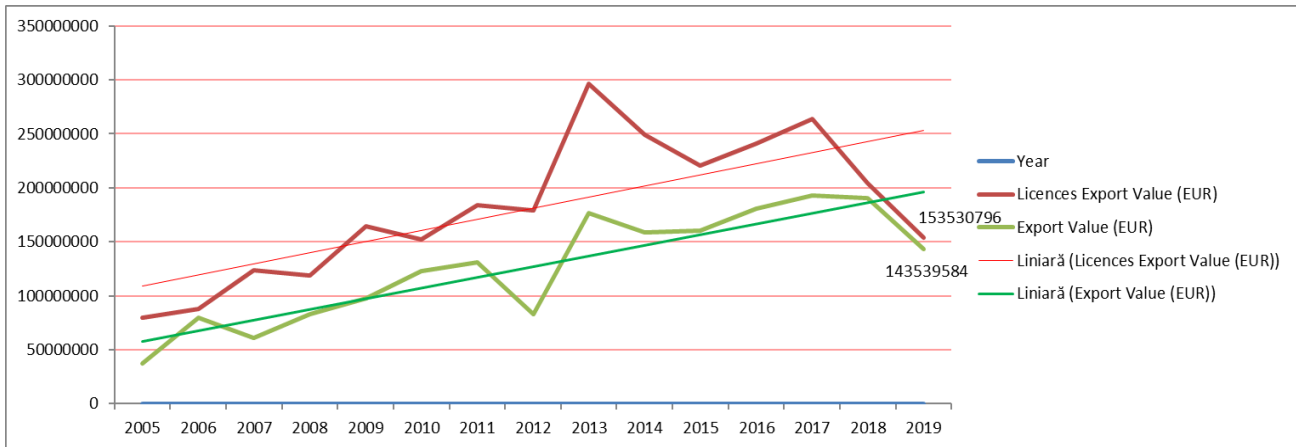


Figure 4. Trends of the Romanian military exports (EURO)

(Data provided by ANCEX, processed by the author)

First, the trend of exports of Romanian military products over a relatively long period of time must be analyzed. Analyzing data on Romanian exports of military products from 1994 to 2019 it is noted that values fluctuated quite a lot, with a historical low in 2001, and today the trend is increasing (about 143.5 million EUR in 2019), but well below the level of 1989, when Romania exported military products worth about 800 million USD.

In addressing the fundamental restructuring of the national defense industry and placing it on a competitive and sustainable basis, several questions need to be answered, namely:

- What kind of defense industry requires the degree of threat to national security?
- Is a technologically advanced industry or basic/incremental/unsophisticated industry necessary to ensure national security?
- Does the national defense industry have to serve exclusively the basic needs of the Romanian armed forces and provide blue collar jobs based on the existing technological and sectorial sector, or are we considering achieving a technologically advanced and sustainable industry only in these primary sectors?
- Is the Romanian state prepared to take decisions for the fundamental restructuring of the national defense industry at the cost of political risks?
- Is Romania prepared to abandon the monopoly of capital/control in the national defense industry, to stimulate and integrate the private sector into the defense industry and to exercise extrinsic control and regulatory rights (e.g. instead of control of participation and management control), control and veto power of the competent authorities over significant transactions with an impact on national security, over the recently adopted model of the veto over energy sector transactions)?

4. Global Defense Market Features

The international defense market is characterized by a stressed dynamism, through fierce competition between large arms-producing companies, amid the very high rate of operational profits obtained by these companies.

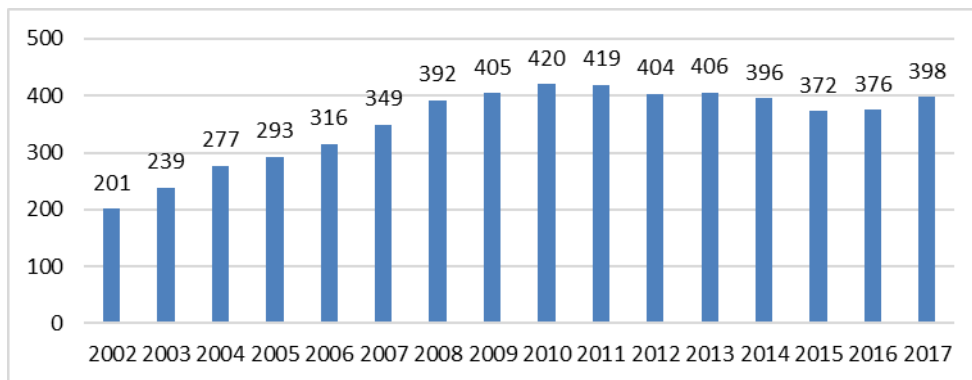


Figure 5. Total arms sales worldwide

(Data provided by SIPRI, processed by the author)

As is observed, the total worldwide arms sales are about 400 billion USD, with the trend of the profile market being of slight growth. The trend in the period 2002 – 2010 was of sharp growth, followed by a period of relative recession (2010 – 2014), now the trend being ascending (2015 – 2017).

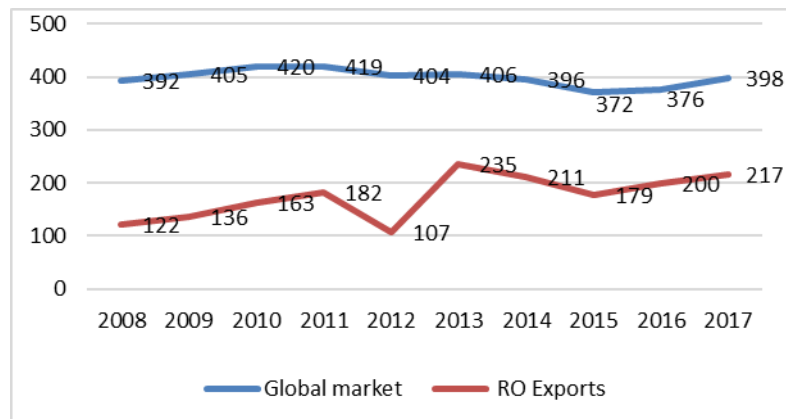


Figure 6. Correlation between global market & Romanian exports

(Data provided by SIPRI and ANCEX, processed by the author)

From the analysis of global arms market trends, compared to the evolution of exports of Romanian military products, there is a direct correlation between the two factors, the only major discrepancy being recorded in the year 2012, amid the emergence of some factors of a subjective nature, generated by the characteristics of the market and the lack of government support to the Romanian defense economy. Carefully analyzing the previous graph, it can be noted that the correlation factor between the two components is very correct, reflecting the fact that the national defense industry is becoming increasingly connected to the defense sector at the global level.

5. Characteristics of the Romanian Defense Market

Prior to 1989, the Romanian defense industry exported military products totaling about 800 million USD/year, which were from over 100 companies, in which approximately 130,000 people were employed. Currently, after successive reorganizations, at the level of the indigenous defense industry, it activates 22 economic operators with full state capital and 17 companies with mixed or private capital, the level of exports of military equipment being approximately 200 million USD (25% of the exports level prior to 1989).

Currently, the Ministry of National Defense acquires military equipment from the internal market by 15%, in the context of which the European average is around 70%, and France acquires 100% of the products made by the defense industry Domestic. The main cause of the low level of retention of Romanian military products by domestic beneficiaries consists of the low technological level of military equipment produced at the level of the industry, which are not tailored to the policies of Acquisition prepared at the level of the Ministry of National Defense and are not able to contribute to the modernization process of the Romanian Army.

In this context, in order to continue to pursue defense affairs, Romania's profile companies mainly focused on exporting military equipment and ammunition. From the statistics made based on the national authority in the field (the ANCEX Control Department of the Ministry of Foreign Affairs) resulted in the above figure which reveals the increasing trend of arms exports.

Although it is on an upward trend, the analysis of the categories of military equipment exported by Romania reveals the disproportionate nature of the range of military products, in the sense that our country carries out most of the export operations with light weapons and combat ammunition. Romania also does not export military technology or military equipment that incorporates cutting-edge technologies, which confirms the low technological level of the indigenous industry of the profile. In fact, most of the Romanian military equipment is produced with technologies from the years 60-80, which is negative both in the technological level of the resulting products and in their quality.

Another issue directly facing the domestic defense industry consists in the lack of specialized personnel operating the industrial equipment to produce armaments, which leads to a decrease in their quality and, implicitly, to increase in production costs.

The low technological level of Romanian military equipment is mainly due to reduced investment in the research and development sector. For example, in the year 2015, the budget allocated by the Ministry of National Defense for this area of strategic interest was 2.67 million lei (approximately 670,000 USD), in 2016 of 1.15 million lei, and in 2017 of approximately 1.2 million lei, while Serbia Invested in the field of research and development, in the year 2017, about 3 million USD.

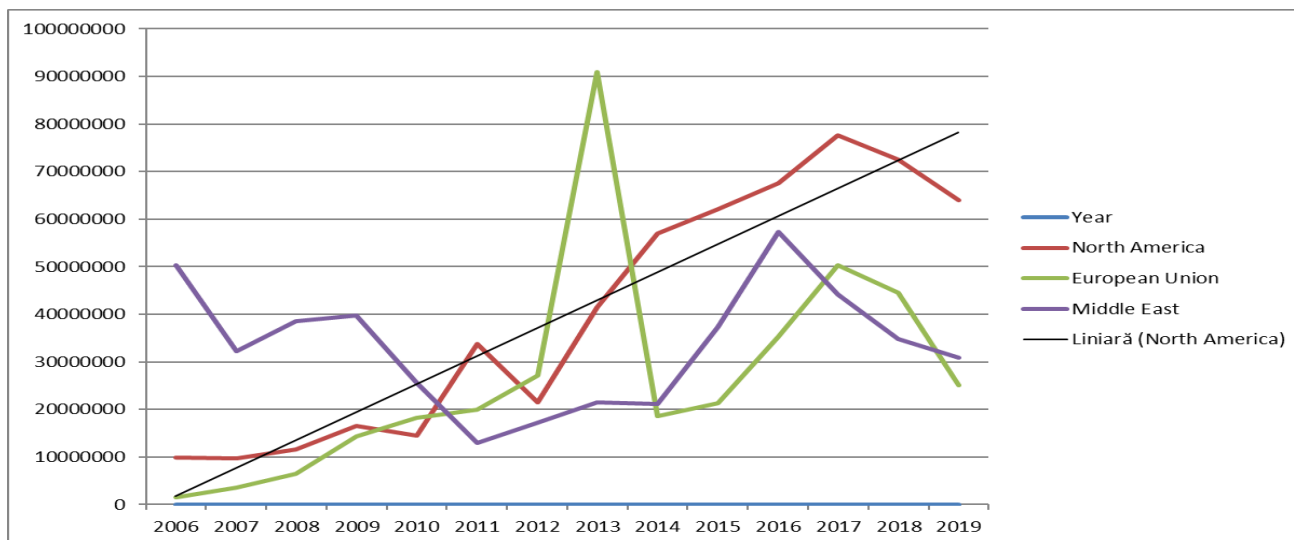


Figure 7. Main exports destinations of Romanian military equipment (2019)

(Data provided by ANCEX, processed by the author)

From the analysis of the said graph, the trend of the Romanian arms exports is changing. Thus, in the period 2006 – 2011, the main beneficiaries of military products produced by the domestic arms industry were the states of the Middle East. This has changed in the period 2011 – 2019, so that currently the areas of export of Romanian military products are North America (especially the United States of America) and the Member States of the European Union.

This trend constitutes an evolution in the plan of Romanian exports to mature and consolidated markets for military products, but the loss of "traditional" Romanian markets is a negative aspect. The history of exports of military products to the profile markets in the Middle East and Africa area, prior to 1990, was a consistent competitive advantage over other states that failed to penetrate these relatively hermetic markets very easily.

The loss of these markets affects the business figures of companies in Romania, but by harnessing previously established relationships can be rectified trade operations with weaponry, especially to states in the Middle East which, in the last period, allocate consistent resources for the endowment of the armed forces. Another cause that led to the loss of these emerging markets consisted of the low technological level of products produced by the Romanian industry.

At the same time, the North American area and the Member States of the European Union are exported equipment with a relatively low technological level entering these markets, especially because of the attractive price offered to these companies.

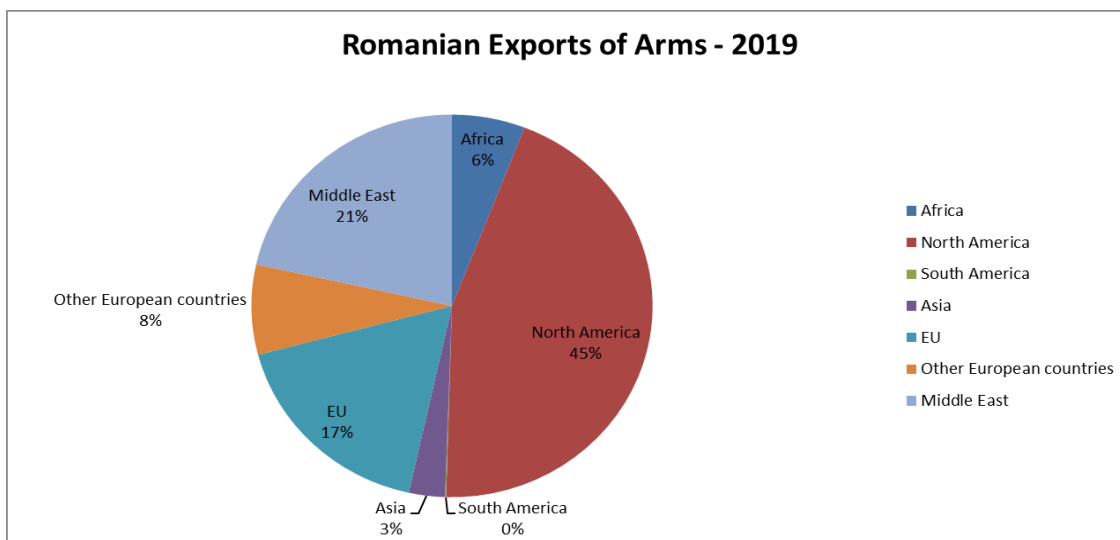


Figure 8. Distribution of exports of Romanian military equipment

(Data provided by ANCEX, processed by the author)

The distribution of exports, made in the year 2019, reported to the predilected areas of exports of domestic military products reveals what we previously mentioned, namely the following destinations: North America – 45%, Middle East – 21%, European Union – 17%, other European countries – 8%, Africa – 6%, Asia – 3%.

This graph shows the marginal role of exports of military products to the area of Africa, which reveals the loss of markets that were traditionally present in Romanian portfolio companies. The loss of these markets is also due to factors of an objective nature, namely embargoes and restrictive measures imposed by international profile bodies (UN, OSCE, European Union etc.) against some states in the African area. Romania rigorously applies the international regime of embargoes and restrictive measures on arms exports, the export control system, coordinated by the ANCEX Control Department of the Ministry of Foreign Affairs, being the most performant within the Central and Eastern Europe area. In fact, the Romanian authorities are constantly and frequently providing advice to the countries of the region to strengthen international export control regimes.

In order to have a correct analysis was carried out the SWOT analysis of the Romanian defense industry, resulting in important conclusions for this strategic industrial sector.

Strengths

- Romania's status as a member of NATO and the EU, enabling defense companies to cooperate with major manufacturers of military equipment in technologically developed countries;
- Romania's ownership of an efficient export control system for military products and technologies, recognized by the US and EU Member States; Romania is the regional leader in export control (established in 1992);
- Access to European non-refundable external financing mechanisms aimed at modernizing the defense industry of the Member States of the European Union;
- Political decision taken in 2017 to allocate 2% of GDP for the defense sector (political consensus of all parliamentary parties to grant 2% / year of GDP for at least 10 years);
- Romania's geostrategic position at the interface with the Russian Federation, which requires NATO consolidation on the southeastern flank to counter the risks generated by this state in the Black Sea Extended Region;
- Strategic partnership with the US, including on the military level, which results in the consolidated presence of the U.S. Armed Forces on the territory of Romania;
- Staff working in the Romanian defense industry are well trained from a professional point of view;
- Completion of multiannual budgetary planning of expenditure dedicated to the endowment of the Armed Forces with modern combat techniques.

Weaknesses

- Chronic underfunding of the defense system until 2017, when the decision was taken to allocate 2% of GDP;
- Lack of off-set contracts in the case of major contracts for the endowment of the Romanian Army;
- Physically and morally outdated military equipment production technologies;
- Shortage of specialized personnel in defense industry companies, especially young people;
- Lack of coherent government strategies to refurbish the defense sector;
- Reduced investment in the research and development sector of military products and technologies;
- Poor and inconsistent cooperation between the Ministry of National Defense, the main beneficiary of Romanian defense industry products, and the Ministry of Economy, the main supplier of military equipment.

Opportunities

- Take over maintenance contracts for complex military equipment purchased by the Romanian Army;
- Transfer of know-how from major producers on the world market to companies in the Romanian defense industry;
- Public-private-academic partnership for the development of military and dual-use technologies;
- Possibility of partnering with strong companies in the Euro-Atlantic area to produce high-performance military products in Romania;
- The development of military technologies and the realization of high-performance products induces positive effects in the economic development of Romania;
- Outstanding potential in the IT&C sector that can also be harnessed at the defense industry level;

- Composition and efficiency of productive units with the same activity profile;
- Possibility of regaining traditional export markets (e.g. Africa, Middle East);
- Use of predictive analyses at the level of the Romanian defense industry to identify opportunities in the world market.

Threats

- Illegal actions (e.g. illegal annexation of the Crimean Peninsula, illegal military actions in Ukraine) and aggressive actions of the Russian Federation, which affected the geopolitical and geostrategic structure in Romania's neighborhoods;
- The continued growth of the military forces of the Russian Federation in the Extended Black Sea Region, which endangers the territorial integrity of the states of the region;
- Repeated threats by Russian Federation officials for Romania to abandon the manufacture of weapons of ex-Soviet origin;
- Effects of the COVID-19 pandemic on the Romanian economy, including at the level of the Romanian defense industry.

Following the application of the SWOT analytical method of the data available at the level of the Romanian defense industry, the following measures have emerged that will contribute to the effectiveness of the policy of purchasing weapons and military products:

- taking a decision at the level of the Supreme Defense Council of the country (CSAT), under the supervision of the President of Romania – President of the CSAT, with a view to prioritizing the acquisition of military capabilities in the medium and long term, taking into account the analysis of threats and risks to national security;
- encouraging technological cooperation with NATO and EU Member States, with a view to setting up joint companies for the production of high-tech military products in Romania, as well as integrating them into production and maintaining them in Romania;
- coordination of procurement between institutions represented in the National Security System to ensure interoperability and to obtain low purchase prices for military products;
- setting up a minimum rate of the ministry of National Defense's budget in the medium and long term (minimum 20%) dedicated to the purchase of military equipment in order to achieve a high degree of predictability for companies operating within the national defense industry;
- carrying out major projects involving companies within the national defense industry to contribute substantially to improving the national production of modern weapons.

In order to contribute to the development of the defense industry in Romania, proactive measures need to be taken at national level, namely:

- comprehensive analysis of the national defense industry to enable the privatization of state-owned companies in the security industry, including by merging companies with the same object of activity;
- analysis of the opportunity for the Ministry of National Defense to coordinate some companies in the national defense industry, bearing in mind that this institution is the main beneficiary of the defense industry in Romania;
- the development of investment programs in the field of military research, including through cooperation between institutions in the National Security System and companies operating in this field;
- the creation of a National Defense Development and Research Program, while modernizing/updating legislation, to enable private investment in development and research;
- developing public-private partnerships with partners of national defense industry companies with NATO entities and EU Member States, as well as the creation of compensation contracts;
- substantial investments in dual-use civilian and military capabilities;

For example, unmanned aerial vehicles (UAVs) could be used for military and civilian purposes: gathering information in rescue missions, monitoring national borders to prevent illegal migration, monitoring of areas used for poaching, monitoring of vehicle traffic. In this respect, it is possible to establish an integrated supervisory system, which can exchange information, as well as costs, between some competent institutions (e.g. The Ministry of National Defense, the Ministry of Internal Affairs, the Ministry of Environment), contributing to the development of the UAV industry in Romania.

- the adoption of a policy to impose common technological standards in the production, research and development and purchase of military products.

The adoption of these standards will facilitate the interoperability of systems, facilitate the use of dual-use (military/civilian) products and technologies, and contribute to a considerable reduction in costs.

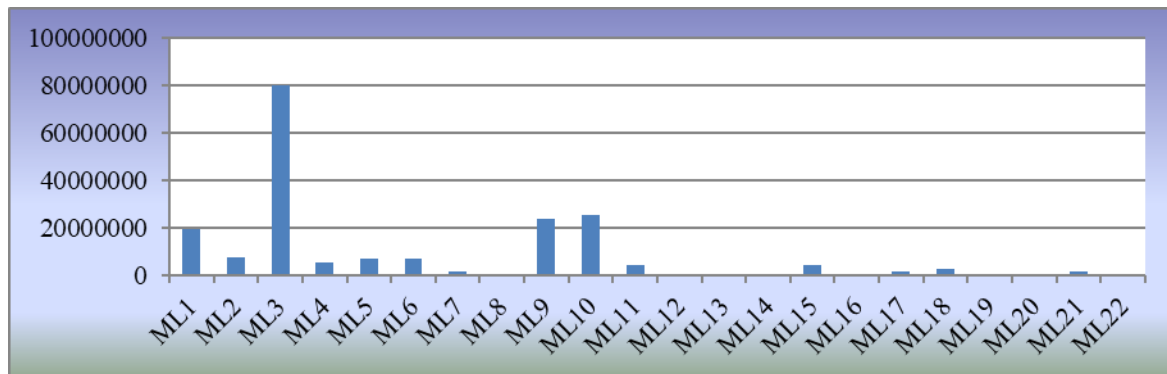


Figure 9. Distribution of exports on type of military items

(Data provided by ANCEX, processed by the author)

At the level of the European Union, including Romania, a single list of military products subject to export control, imports and other operations (nationally approved by Government Decision No. 924 of 2007, published in the Official Gazette of Romania, part I, No. 579 of 23 August 2007). According to this list, military products fall into 22 categories, as follows:

- ML 1 – arms with a barrel of less than 20 mm, other firearms and automatic weapons with a caliber of less than or equal to 12.7 mm (0.5 inches) and accessories, as well as components specially designed for them;
- ML 2 – Arms with a barrel of 20 mm or more, other weapons or weaponry with a caliber greater than 12.7 mm (0.5 inch caliber), launchers and accessories, and specially designed components thereof;
- ML 3 – Ammunition and fire-regulating devices, as well as components specially designed for them;
- ML 4 – Bombs, torpedoes, unguided missiles, guided missiles, other explosive devices and charges and related equipment and accessories specially designed for military use, as well as specially designed components;
- ML 5 – Fire management systems and related alerting and warning equipment and systems, test equipment, adjustment and counteraction specially designed for military use, as well as components and accessories specially designed for them;
 - ML 6 – Terrestrial vehicles and components thereof;
 - ML 7 – Chemical or biological toxic agents, agents for the control of public disorders, radioactive materials, equipment, components and related materials;
 - ML 8 – Energy materials and related substances;
 - ML 9 – Warships, auxiliary equipment and devices, special vessels, and components thereof, specially designed for military use;
 - ML 10 – aircraft, lighter than air, non-piloted aerial vehicles, aviation engines and aircraft equipment, related equipment and components, specially designed or modified for military use;
 - ML 11 – Electronic equipment for military use, as well as components specially designed for them;
 - ML 12 – High-speed kinetic energy weapons systems and related equipment, as well as components specially designed for them;
 - ML 13 – Armored or protective equipment and structures and components thereof;
 - ML 14 – Specialized equipment for military training or simulation of military scenarios, simulators specially designed for the training of the use of weapons and armaments controlled by ML 1 or ML 2, as well as components and accessories specially designed for them;
 - ML 15 – Imaging or counteraction equipment, specially designed for military use, as well as components and accessories specially designed for them;

- ML 16 – Forged, molded and other semi-manufactured products whose use in a product subject to control is identifiable by material composition, geometry or operation and which are specially designed for any of the products subject to control;
- ML 17 – Other equipment, materials and libraries, as well as specially designed components;
- ML 18 – Equipment designed to produce products subject to control, in accordance with the list of military products;
- ML 19 – Directed energy weapons systems, related or counteracting equipment and test models as well as components specially designed for them;
- ML 20 – Cryogenic and superconducting equipment, as well as components and accessories specially designed for them;
- ML 21 – Software for military applications;
- ML 22 – Military technology.

As seen from the figure shown above, Romania exports only military products from 14 categories, from the total of 22, the main products consisting of ammunition (category ML1), components for aircraft (ML10), military vessels (ML9) and small arms and light weapons - SALW (ML1). This confirms the assertion that the technological level of the defense industry is relatively low, lacking the components that encompass modern technologies, namely software for military applications (ML21) and military Technologies (ML22).

According to this data, in Romania leading sub-sectors within defense industry are represented mainly by: tracked and wheeled-armored vehicles; infantry weapons and ammunition; artillery systems and ammunition; missiles systems and rockets; powders, explosives; military equipment and subsystems; low and medium altitude radar systems; used U.S. fighter aircraft upgrades; replacement parts and service; defense training and consultation.

6. Discussions

The Romanian Industry of Defense has an extraordinary potential of development in near future, considering geostrategic position of Romania in South-Eastern flank of NATO. In the same time, the Romanian National Defense Industry is well known at some emergence international market, being possible to increase exports in some countries with financial potential.

The allocation of resources for the transformation, modernization and endowment of the Romanian Armed Forces capabilities/structures will take place in accordance with the priorities set by the Program of transformation, development and procurement of the Romanian Armed Forces by 2026 and beyond, including the build-up and refilling of stocks. The financial allowances for the modernization of military endowment by means of new acquisition programs, modernization and/or general overhaul of the existing equipment will target the following categories:

- track and wheeled combat vehicles - armored personnel carriers, MBT's, infantry fighting vehicles and their derivatives;
- field artillery systems - MLRS, self-propelled 155 mm and 105 mm howitzers, including ammunition;
- C4ISR systems — integrated communication information systems, brigade and division C2, specific equipment for tactical air controllers' teams (JTAC), satellite communication system (SATCOM), network security systems, IT strategic equipment stocks, software etc.;
- individual and group armaments and equipment — individual and collective CBRN detection and protection systems, NATO compatible individual weapons and specific equipment, including those for special forces, portable antitank missile systems, advanced individual combat systems;
 - engineering and counter IED equipment;
 - armored and non-armored all-terrain vehicles;
 - multifunctional transport platforms;
 - combat and transport aircraft, including specific communication and positioning systems;
 - medium and heavy helicopters
 - ground based air defense systems - SHORAD/V-SHORAD; air target systems for GBAD training; deployable radio relay modules;

- combat ships - Type 22-R frigates revamping, turbines, antisubmarine torpedoes, antipiracy capabilities, multifunctional corvettes, missile fast attack boats, mine hunters, riverine vessels, minelayer and minesweeper, assault boats and other naval platforms;
- support ships - support ships for special forces operations, harbor and maritime tug, riverine tug and logistic support ships;
- static and mobile ISR and electronic countermeasures systems - optical and optoelectronic equipment, ISTAR equipment, radars, ground mobile electronic warfare systems for the Air Force, SCOMAR system (Black Sea Traffic Control, Surveillance, Observation Complex System), CBRN reconnaissance and data processing equipment, maritime situation surveillance equipment, hydro weather systems etc.;
- other goods for the structures' operating support, including integrated security systems for military units/objectives, ROLE-2 deployable medical facility and security containers.

Also, a relevant opportunity is to cooperate with the main arms manufacturers in the Euro-Atlantic area, especially with the US, which is currently the world's leading supplier of modern military equipment. Lately, Romania has developed a special strategic partnership on the relationship with the US, by purchasing modern military equipment that has been included in the national endowment program of the Romanian Armed Forces. In this context, an economic partnership can be achieved, in the sense that certain modern equipment can be made in Romania under the license of US companies.

Considering some restriction on export of military products and technologies is necessary to take appropriate measures in order to comply with all international treaties in the field of export controls of military items and technologies, including embargoes regime. Romania is member of Wassenaar Arrangement and complies with all the EU regulations in the field of export controls of military products and technologies, being the regional leader in this domain.

Moreover, the Romanian Arms Industry is confronting with systemic problems that have impact in development of this important sector of activity to perform at its real potential. In this context, it is necessary to have important investments in research & development domain, as well as extension of strategic partnerships with relevant companies from Euro-Atlantic space, which will contribute to assimilation of modern technologies by the Romanian Arms Industry.

In this context, an important factor is represented by acquisition of arms and military equipment by the Romanian Arms Forces. In present, the absorption percent is around 10% more under the medium of member states of the European Union (70%). The Romanian Arms Forces acquisition process must consider the threats coming from East, including hybrid threats.

From the analysis of the previously presented data, it results that Romania has lost important markets in the Middle East and Africa, being necessary additional efforts of Romanian companies to regain these markets, as well as orienting exports to emerging areas with development potential (e.g. arms markets from Asia).

This article is created for the benefit of managers in Romanian companies in the defense industry as well as for potential investors within the Romanian Defense Industry and for decision makers in the Ministry of Economy and Ministry of National Defense.

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