

CONSIDERATIONS ON THE IMPACT OF THE DEFENSE INDUSTRY ON THE NATIONAL ECONOMY

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Abstract: *The difficult period we are going through today, characterized by multiple challenges and a constantly changing international dynamic, demonstrates unequivocally that national security and economic development are interdependent, and the defense industry, a central pillar of national security, also plays a significant role in the national economy by creating jobs, stimulating innovation and generating income.*

Romania's defense industry, in the context of globalization and increased security needs, plays an important role in the country's economic development. This paper explores the economic impact of the defense sector, analyzing its contributions to GDP and economic output. Starting from defense economics theories, it examines how investments in the defense sector can stimulate economic development through multiplier effects and technological innovation. The study also highlights the direct and indirect contributions of the defense industry on the labor market and competitiveness, having a significant impact on other industries.

In conclusion, it is shown that the defense sector has considerable potential to support long-term economic growth, but emphasizes the importance of efficient resource management, as well as adequate integration of the industry into the national economy to maximize the positive impact on the Romanian economy.

Keywords: defense industry, defense spending, economic impact, economic growth

1. Introduction

The defense industry plays an essential role in the national economy of many states, and Romania is no exception. With a significant history in the defense sector and being a NATO member since 2004, Romania is committed to respecting international security standards, which implies substantial investments in this area. In recent decades, the need to strengthen defense capabilities has been emphasized by regional and international geopolitical developments, such as the conflicts in Ukraine and the Middle East, as well as the strategic commitments assumed by Romania towards its

international partners. The defense industry, through its research and development, production and maintenance component of military equipment, not only contributes to national security, but also represents a significant lever for economic growth.

According to the theory of defense economics, investments in this sector can have multiple economic effects, from stimulating technological innovation to creating jobs and developing professional skills. At the same time, due to the increasing integration of the defense industry with other industries, such as the IT sector and the engineering sector, these

investments have considerable potential to generate indirect economic benefits.

In Romania, in the context of commitments to allocate 2% of GDP to defense, according to NATO requirements, the defense industry has become a subject of great interest in public policies. Increasing budget allocations for defense not only provides the necessary resources for the modernization of defense equipment and infrastructure, but also creates economic opportunities for companies in the field and for a wide range of suppliers and collaborators in the industry.

However, discussions about the economic impact of the defense industry are often complex, requiring a balanced analysis between the benefits and costs involved. On the one hand, high defense expenditures can represent a burden for the state budget, especially in a global economic context marked by instability. On the other hand, a well-developed defense industry can offer Romania a series of competitive advantages on the international market, through exports of advanced technologies and equipment. Thus, this paper aims to analyze the role of the defense industry in Romania's economic growth, with a focus on the direct and indirect contributions of this sector to overall economic development.

2. Key Theories and Concepts Related to Defense Economics

Defense economics is a specialized branch of economics that studies the impact of defense spending and investment on economic development, available resources, and national security. The defense industry is essential for both the development of the national economy and the protection of public interests. The successful operation of this strategic state industry requires a specific and well-founded economic policy [1]. In this chapter, we will explore the fundamental theories and concepts that explain the interaction between defense investment and economic growth. These theories provide a conceptual basis for

understanding how the defense industry can influence the economy, both by stimulating demand and innovation, and by technology transfer and the development of adjacent industries.

2.1. The Multiplier Effect of Defense Spending

One of the main theories in defense economics is the Keynesian multiplier theory, which states that government spending has a direct impact on aggregate demand and, consequently, on economic growth. Government spending on defense generates demand for specific goods and services, which stimulates economic activity in a variety of sectors, from manufacturing to related services. The multiplier effect assumes that each monetary unit invested in defense can generate a higher growth in GDP, due to the increased demand for related goods and services, as well as the creation of jobs in complementary industries. For example, investments in technological research and development in the defense sector can have a positive impact on innovation, creating a spillover effect in commercial industries. Companies that produce defense technologies often provide incentives for the development of new innovative technologies and processes that can be used in other sectors. Thus, the multiplier effect of defense spending contributes not only to short-term economic growth, but also to long-term technological advancement [2].

2.2. The Theory of the “Crowding Out” Effect in Defense Spending

Another important concept is the “crowding out” theory, according to which high government spending on defense can reduce the resources available for other sectors, thus limiting the potential for economic growth. According to this theory, defense investments can compete with other economic areas for public resources, such as education, health, and civil infrastructure, which can reduce the pace of development in these sectors [3]. In the long run, this phenomenon can create

pressure on the state budget, given that defense spending does not always produce an immediate and visible economic impact, but is oriented towards strategic and security goals. However, the negative impact of “crowding out” can be compensated under certain conditions, such as when defense investments stimulate the development of advanced technologies that can also be used in other industries. In this sense, the defense industry can act as a catalyst for economic growth, if resources are managed efficiently and if integration between the defense sector and other economic sectors is ensured.

2.3. The Role of Innovation and Technology Transfer

Innovation and technology transfer are central elements in the defense economy, as many technologies originally developed for military applications end up being used in the civilian sector. Notable examples include the development of the Internet, GPS systems, and other digital technologies, which have had a transformative impact on the global economy. In Romania, investments in defense research and development could contribute to the modernization of other industries, such as the IT sector, telecommunications, and the aerospace industry. This “spin-off” phenomenon is essential for the economy, as it contributes to the creation of new jobs, the diversification of products and services available on the market, and the increase of international competitiveness [4]. Technology transfer is encouraged by international partnerships, such as those between Romania and other NATO member countries, which allow the exchange of knowledge and resources. These collaborations support innovation and the improvement of defense equipment production and supply capabilities. In this context, Romania can benefit from the technological expertise of other countries and develop its own technologies, thus contributing to the consolidation of the

defense industry and the growth of GDP through exports [5].

2.4. Effects on the workforce and vocational training

The defense industry makes a significant contribution to the labor market, providing specialized jobs and stimulating vocational training in highly skilled fields. In general, this sector requires employees with advanced technical skills, such as engineering, information technology and logistics management, which increases the demand for specialized education and training. In Romania, the development of the defense industry can stimulate the establishment of vocational training programs in universities and research institutes, offering young people career opportunities in fields with high added value. In addition, by creating stable and well-paid jobs, the defense industry contributes to reducing the unemployment rate and stimulating domestic consumption. In the long term, investments in education and vocational training for the defense sector can support the development of human capital and can increase the overall competitiveness of the Romanian economy.

2.5. Defense Economics in an International Context: Challenges and Opportunities

The defense industry is a sector deeply influenced by the international context, budget allocations and strategic partnerships. As a NATO member, Romania must comply with certain standards of military training and budget allocation, which entails a series of challenges, but also economic opportunities. Participation in international alliances allows Romania to attract investments and benefit from technology transfers and expertise from international partners. At the same time, the increase in exports of defense equipment and technologies represents an opportunity for the national economy, strengthening Romania's position on foreign markets [6]. In conclusion, the defense economy

represents a field with a major impact on economic growth, but also with challenges related to resource allocation and integration into the national economy. The economic theories discussed in this chapter, from the multiplier effect and “crowding out”, to the role of innovation and the effects on the workforce, offer a complex perspective on how the defense industry can contribute to Romania’s development. Effective management of this sector can transform the defense industry into an engine of economic growth and technological innovation, with long-term beneficial effects for the national economy.

3. The Contribution of the Defense Industry to Economic Growth

The Romanian defense industry makes a significant contribution to the growth of the national economy, both directly through the production of military equipment and technologies, and indirectly through the stimulation of other industries and through the effects on the labor market and exports. In this chapter, we will analyze the economic contributions of the defense sector on industrial production, trade and employment. Defense industry policy has an impact on encouraging and supporting economic growth in a region. The way it is economically encouraged, based on the development and allocation of defense equipment production, independently offers the potential to develop the national economy [7].

3.1. Direct Contribution to GDP

The direct contribution of the defense industry to Romania's GDP comes from the production of specific goods and services, intended to meet the security needs of the state. In this regard, the defense industry stands out through the development of sectors such as the manufacture of military equipment, cyber defense systems and surveillance technologies.

According to recent data, Romania has gradually increased investments in the defense sector in order to comply with its

commitments to NATO, which has led to an increase in production in this industry and a higher contribution to GDP.

These investments are supported by the allocation of approximately 2% of GDP to defense, which significantly contributes to the increase in national production and revenues to the state budget. In this context, state and private companies in the defense industry collaborate to meet domestic requirements, thus contributing to economic growth through the development of advanced equipment and technologies [8].

According to data published by the National Institute of Statistics and the Ministry of Economy, the defense industry contributes approximately 1% to Romania's GDP. For example, in 2020, the gross value added generated by the “manufacture of arms and ammunition” sector was estimated at approximately 0.2-0.3% of GDP. In conclusion, although the current contribution of the defense industry to Romania's GDP is modest, its strategic importance is high, through exports, technological development and participation in NATO programs, with potential for growth in the current geopolitical context.

3.2. Indirect Contribution by Stimulating Other Industries

The defense industry has an indirect impact on the economy by stimulating adjacent sectors, such as the IT industry, transport and logistics, the chemical industry and the advanced engineering sector. In this context, the demand for materials, technologies and services required for the production of defense equipment stimulates production and innovation in these complementary industries [9].

A significant example of the indirect impact is the collaboration with the IT sector for the development of cybersecurity and surveillance technologies. In addition to protecting defense infrastructure, these technologies can also have applicability in the private sector, contributing to the strengthening of Romania's digital

economy. In turn, the transport and logistics sectors are strongly influenced by defense needs, facilitating the development of advanced and efficient transportation solutions.

3.3. Impact on Employment

The defense industry has a significant impact on employment and its development through several mechanisms. “A national defense industry strengthens the power and prestige of the state, but also ensures high technological development and highly qualified jobs. The defense industry has a major influence on the operational capacity of national security institutions, which determines the need for comprehensive measures to restore its strategic role in the national economy” [10].

The defense industry creates specialized jobs, having a significant impact on employment and vocational training in Romania. The defense sector requires highly qualified employees in fields such as engineering, information technology, equipment manufacturing and logistics, which increases the demand for qualified labor and stimulates investments in education and vocational training in these areas.

The defense sector also plays an important role in retaining qualified human capital in Romania, offering career opportunities in high-tech fields, which prevents the emigration of skilled labor and supports the local economy [11].

3.4. Impact on Exports and International Trade

Romania exports a wide range of defense equipment and technologies, which contributes to balancing the trade balance and increasing foreign income. As a NATO member state, Romania has opportunities to export defense products to other alliance member countries and international partners, benefiting from a regulatory and support framework for the development of strategic partnerships. Exports of military equipment and technologies not only contribute to GDP, but also support the

development of production and research capacities in Romania. The Romanian defense industry benefits from international partnerships that support technology transfer and access to foreign markets, which facilitates the growth of exports. These partnerships contribute to strengthening Romania's reputation in the defense sector, creating opportunities for attracting foreign investment and increasing export income.

Thus, in 2023, definitive exports of military products were made, totaling 321 million Euros, of which 237 million Euros were made through individual licenses, and 84 million Euros through global licenses. Comparatively, in 2022, we recorded definitive exports of military products, reported by economic operators, worth 215 million Euros, of which 145 million Euros represented definitive exports carried out through individual licenses. The exported equipment was mainly represented by: assault weapons and accessories, sniper rifles, artillery rounds, anti-tank grenade rounds, small arms and light weapons ammunition, as well as ammunition components, artillery sighting equipment and military explosives.

3.5. Long-Term Effects on the Economy

The defense industry can have long-term beneficial effects on the national economy, if supported by effective policies and investments in innovation. In the current context, the development of a competitive defense industry is essential for Romania, given the requirements for modernization and streamlining of military capabilities. The development of a solid technological and production infrastructure can strengthen Romania's economic position in the long term, ensuring economic stability and competitive capabilities in international markets. Investments in the development and introduction of state-of-the-art defense technologies and capabilities will be supported [12].

Through innovation and technology transfer, the defense industry contributes to

the development of high-tech solutions that can be used in other industries, from the healthcare sector to telecommunications. Thus, investments in research and development in this sector can stimulate sustainable economic growth and diversification of the Romanian economy, contributing to the development of a resilient and competitive economic ecosystem in the long term.

The contribution of the defense industry to Romania's GDP and economic output is significant and multidimensional. In addition to its direct impact on GDP, the defense sector also stimulates other industries, contributes to employment and professional development, increases exports, and supports long-term innovation. To maximize these economic benefits, Romania should adopt effective public policies, support defense research and development, and continue strategic partnerships at the international level. Thus, the defense industry can become a fundamental pillar for economic growth and national stability.

4. Defense Industry in Romania

The post-December period in Romania represented a moment of essential reconfiguration and adaptation for the country's defense industry, in the context of the political, economic and social changes brought about by the fall of the communist regime in December 1989. This stage was characterized by the transition to a more complex and dynamic geopolitical framework, imposing the need for a fundamental revision of priorities and strategies in the defense sector. In the context of these significant transformations, it is imperative to investigate the evolution, adaptations and implications that occurred in the Romanian defense industry in the post-December period, examining both the progress and innovations, as well as the obstacles and dilemmas encountered on the path to modernization and alignment with international standards. The dissolution of

the Warsaw Pact and, at the same time, the end of the Cold War, in the following period determined a decrease in Romania's arms exports, by limiting the markets on which Romania operated in the arms sector, as a result of the signing of a series of treaties for the reduction of armaments of the signatory countries, countries with which Romania had commercial relations in terms of armaments and military equipment. One of these agreements is the Treaty on Conventional Armed Forces in Europe (Coordinated Annual Review on defence), which requires both the member countries of the Warsaw Pact alliance and NATO member countries to reduce their armed forces and armaments considerably. By implementing these strategies, a reduction in orders intended mainly for the National Defense System was observed, in line with the lower requirements of the armed forces for imports of military equipment and technology intended to cover equipment needs. This decrease in production in the domestic defense industry sector had consequences such as the emergence of technical unemployment, the decrease in salaries, the migration of specialists to other economic fields and, ultimately, the division of this economic branch between the Autonomous Directorate for the Production of Military Equipment (RATMIL) and the Army Arsenal (RA).

The period 1998 - 2010, represented by the pre-accession period and the accession and integration of the Romanian state into NATO, did not bring significant benefits to the domestic defense industry. Thus, contracts with domestic customers continued to decrease alarmingly, causing an underload of production capacities to below 5% and a dramatic drop in turnover. The efforts of the Ministry of Defense continued to focus on imports to meet NATO equipment requirements, which led to the excessive accumulation of debt by the state. During this period characterized by extensive restructuring, over 50,000

employees in the defense industry were laid off, especially among the directly productive personnel, and civil and military capacities were separated, with industrial parks being created to capitalize on the available assets through rental or sale. The period under review is marked by efforts to stabilize the post-crisis economy and reaffirm Romania's international commitments, including to NATO. The increase in spending in the last years of the period under review can be seen as a response to the intensification of security threats in the Eastern European region, as well as to the requirements of maintaining a high level of military preparedness. Compared to the previous period (2004-2009), which was characterized by a significant increase in defense spending culminating in a peak in 2008 followed by a decrease in 2009, the period 2010-2024 initially shows stagnation due to the economic crisis, followed by a recovery and steady growth. The recovery and growth in the period 2010-2024 suggest that Romania has strengthened its economy sufficiently to be able to allocate significant resources to defense again, maintaining its commitments to NATO and adapting to new security challenges. This period is characterized by a constant effort of recovery and sustained growth. Thus, this trend underlines Romania's ongoing efforts to modernize its armed forces and maintain its international security commitments, in the context of a stabilizing economy and a region marked by new security challenges. During the period 2014-2024, the Romanian defense industry went through a complex process of adaptation to the requirements and developments in the international and regional environment in terms of security and defense. During this time, considerable efforts were made to modernize and strengthen the national defense capacity, as well as to promote innovation and competitiveness in the defense industrial sector. Through sustained investments in research and development, advanced

technological solutions were sought to improve the efficiency and performance of military equipment. Collaborations and partnerships were also intensified, both at the national level, between the public and private sectors, and at the international level, with NATO and EU member states, in order to develop joint projects and programs in the field of security and defense. At the Warsaw Summit of Heads of State and Government in July 2016, NATO decided that the Black Sea is the southern section of the Eastern Flank and that, from now on, the coherent presence of Allied land, naval and air forces in, on and from the region, on a rotational basis, will be the connecting link between the Alliance regions. Romania's Strategic Defence Review, developed in 2016, serves as the basis for developing the capabilities necessary to match the country's positioning in the international security environment. The strategic programmes, initiated based on the capabilities developed by the Strategic Defence Review, aim to ensure the realignment of Romanian defence capabilities to the required level of performance, including those related to NATO operations, in accordance with the principle of the Alliance and the role it plays in ensuring and maintaining transatlantic security. Based on the orders placed by the Romanian Ministry of Defence to enterprises belonging to the national defence industry, the development of the entire field has been outlined.

According to NATO analyses and press releases, all members of the organization increased their military spending in the last year (2024). Thus, the total military spending of NATO members amounted to 1,506 billion dollars, or 55% of global military spending. Of the 32 NATO members, 18 states, including Romania, spent at least 2.0% of GDP on their armies, according to the SIPRI methodology, an increase of 11% compared to 2023.

To exemplify the significant progress made by the Romanian defense industry, we can

recall the collaborations with international giants Rheinmetall (Germany) and Hanwha Aerospace (South Korea), materialized in strategic investments, technology transfers and the development of local production capacities. Thus, in February 2024, Rheinmetall acquired 72.5% of the shares of Automecanica Mediaș for 5 million euros, the company being renamed Rheinmetall Automecanica SRL. An important objective of the new company is to consolidate the supply chain for NATO's eastern flank through the production of Lynx KF41 armored vehicles and HX military trucks. Also, in September 2024, Rheinmetall Automecanica Mediaș and Automecanica Moreni signed a letter of intent for the joint development of infantry fighting vehicles.

In May 2024, Hanwha Aerospace signed a research and development cooperation agreement with the National Institute for Aerospace Research “Elie Carafoli” (INCAS), aiming to develop weapons systems and aerospace technologies. Hanwha also announced the construction of a factory in Dâmbovița County, with work starting in 2026, for the local production of the K9 and K10 systems, in collaboration with Romanian companies such as Iveco and Pro Optica.

5. Conclusions

The defense industry in Romania represents a strategic sector with a significant impact on the national economy, influencing not only the security and stability of the country, but also economic development on multiple levels. The analysis carried out in this paper highlights how the defense sector contributes to GDP growth, stimulates innovation, creates specialized jobs and favors the development of complementary industries.

From a theoretical point of view, defense investments generate multiplier effects on the economy, stimulating demand for goods and services, contributing to job creation and generating revenue for the state budget.

The multiplier effects are particularly evident in industries such as IT, engineering, logistics and advanced technology, where the high demands of the defense sector stimulate innovation and the development of high-performance solutions.

However, to maximize the economic benefits of this sector, efficient resource management and a coherent public policy supporting research and development in the field of defense are necessary. Investments in technological and production infrastructure, as well as in the professional training of the workforce, are essential for the sustainable development of this sector and for the full exploitation of its economic potential.

In the long term, a competitive defense industry well integrated into the national economy can become a pillar of economic growth and technological development for Romania. If the path of supporting policies oriented towards innovation, professional training and international partnerships is continued, the defense industry has the potential to contribute substantially to the modernization of the economy and to increasing Romania's competitiveness on the international stage.

In conclusion, Romania's defense sector represents not only a strategic necessity, but also a major economic opportunity.

The development of a well-founded and future-oriented defense policy can transform this sector into an engine of economic growth, contributing to the consolidation of the Romanian economy and improving the quality of life in the long term.

Thus, the defense industry can become an essential contributor to Romania's economic stability and national security, provided that it is supported by effective policies and strategic investments.

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