

**TECHNOLOGICAL CHALLENGES RESHAPING THE DEFENSE
INDUSTRY AND THEIR IMPACT ON ECONOMIC GROWTH *¹**

UDC 338/ 330.1

DOI: 10.52063/25792652-2023.4.19-167

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Inspired by technological innovations the ways wars are nowadays led have dramatically changed especially after the 4th industrial revolution. Technologies raise many issues for the future of global defense ranging from changes in military structures, strategies eventually affecting the overall economies of the countries. The aim of our article is to unveil some of the defense issues based on technological advancements that are serving as driving forces for the economic growth and as such underline the significance of defense R&D. The problems considered in the article mainly refer to the study of advanced defense industry within the framework of newly adopted security challenges and their overall impact on the economic growth (taking into consideration applicable experience from other countries).

The scenarios of “fixed” threats are no longer determinant for the wars since the rapid changes in the sphere make conflict affected countries be more predictive against each other. Our problem is to study the challenges of technological changes and countries’ capability of adaptation to it. To give the “big” picture of technology-affected defense industry, we have used the method of scientific abstraction and used quantitative and qualitative data analysis on the relation between defense and economy.

Thus, the research has shown that significant features of modern military defense related technologies that link people, weapons, sensors, platforms, AI-based decision-making equipment and eventually result in an immense increase in speed, synchronization and provide mass effects also have their undeniable impact on the country’s economy.

Keywords: defense, economy, security, technology, R&D, peace, military.

* Հոդվածը ներկայացվել է 30.09.2023թ., գրախոսվել՝ 28.10.2023թ., տպագրության ընդունվել՝ 30.12.2023թ.:

¹ This work was supported by the Higher education and Science Committee of MESCS RA (research project N—23AA-5B013).

Literature Review

There are various approaches whether defense spending affects economies positively and negatively. Dunne, Smith, and Willenbockel (2005), sometimes known as DSW (2005) provided an influential neoclassical approach by adopting the framework of the economic growth through empirical research.

Atesoglu (2002), Kollias, Mylonidis, Paleologou (2007) argue that defense spending increases purchasing power and aggregate demand, thus creating positive externalities and positively affecting economic growth. Whereas D'Agostino, Dunne, and Pieroni (2012), Dunne and Tian (2015) suggest that defense spending has negative impact on the economies of the country considering the argument of “guns vs. butter” focusing on the concept of trade-offs.

Current technological advancements have brought colossal changes to almost all sectors of human interaction including defense. The approaches to defense R&D have been criticized in many aspects since certain economists consider that defense R&D does not necessarily serve civilian sector as well. Lichtenberg admits that unlike cons and pros on this matter, defense R&D is continuously being funded and the majority of the countries pay significance to budget for military purposes.

Meantime, current R&D necessarily crosses the fact that technological superiority and situational awareness determine political and economic decisions and as Cowan & Fora state, R&D expenditures have been steadily increasing since World War II.

The evolvement of defense industry as a part of economy is beneficial especially for the countries at regional conflicts, yet it should be beneficial during the peacetime as well. Hence, Bitzinger & Richard assume that cluster formation serving both civilian and defense purposes will eventually magnify power projection in the whole economy.

Technological Advancement and R&D as Driving Forces for Enhancing Military Capabilities

The disputes over the negative and positive relations on the economic growth both have their considerable arguments. Currently military spending is steadily rising and changing its composition. It peaked in the late 1980s with the processes of improving East-West relations and then declined with the end of the Cold War. However, in 1999, the ‘global war on terror’ (driven mainly by the cost of war in Afghanistan and Iraq) made countries emerge massive defense spending (Sköns 35). Following 2001, NATO defense ministers openly acknowledged the goal of allocating 2% of GDP to defense (which took different volumes in case of developed and developing countries due to colossal differences in their GDPs). At the level of heads of state and government in 2014, NATO partners agreed on allocating 20% of defense resources to equipment upgrading (NATO 2014). Similar objectives were quickly approved by the European Council (2016).

However, NATO's dataset of defense expenditure shows mainly a tendency of growth as seen from Table 1.

Table 1 : Defence expenditure

Million national currency units

	2014	2015	2016	2017	2018	2019	2020	2021	2022e	2023e
Current prices										
Albania (Leks)	18 788	16 671	16 250	17 199	18 995	21 670	21 348	23 072	25 848	40 256
Belgium (Euros)	3 913	3 789	3 848	3 932	4 101	4 253	4 665	5 276	6 529	6 658
Bulgaria (Leva)	1 102	1 116	1 186	1 255	1 593	3 771	1 920	2 109	2 672	3 413
Canada (Canadian dollars)	20 076	23 900	23 474	30 761	29 025	29 949	31 289	31 976	33 900	39 339
Croatia (Euros)	811	804	756	812	805	881	861	1 150	1 219	1 312
Czechia (Koruny)	41 003	47 264	45 598	52 805	59 752	68 373	74 257	84 864	91 000	112 100
Denmark (Kroner)	22 769	22 633	24 190	24 961	28 787	29 929	31 962	33 161	38 726	47 169
Estonia (Euros)	386	418	450	479	521	569	630	633	779	1 101
Finland (Euros)	3 004	3 065	3 089	3 131	3 238	3 483	3 642	3 503	4 485	6 892
France (Euros)	39 149	39 199	39 950	40 852	42 748	44 206	46 018	47 790	49 616	53 300
Germany (Euros)	34 749	35 898	37 598	40 265	42 127	46 936	51 392	52 431	57 681	64 055
Greece (Euros)	3 939	4 073	4 190	4 208	4 560	4 483	4 812	6 764	8 054	6 703
Hungary (Forint)	281 402	316 338	362 798	468 765	436 500	636 566	852 321	927 965	1 212 914	1 813 470
Italy (Euros)	18 427	17 642	20 226	21 166	21 702	21 042	26 360	28 015	28 758	29 718
Latvia* (Euros)	221	254	364	430	601	618	651	696	813	967
Lithuania* (Euros)	322	425	575	724	895	977	1 030	1 105	1 649	1 872
Luxembourg (Euros)	190	225	213	288	301	341	373	341	485	573
Montenegro (Euros)	52	51	56	58	64	66	72	77	82	123
Netherlands (Euros)	7 788	7 816	8 234	8 539	9 456	10 778	11 249	11 789	14 808	15 751
North Macedonia (Denars)	5 743	5 853	5 770	5 532	6 232	8 029	8 303	10 604	12 899	17 025
Norway (Kroner)	48 660	49 529	54 022	56 664	61 349	66 318	68 054	72 483	83 865	89 657
Poland* (Zlotys)	31 874	39 940	37 082	37 558	42 824	45 404	52 110	58 304	73 898	133 720
Portugal (Euros)	2 263	2 384	2 364	2 424	2 750	2 947	2 867	3 283	3 391	3 921
Romania* (New Lei)	9 014	10 337	10 738	14 765	17 183	19 527	21 431	22 027	24 311	39 294
Slovak Republic (Euros)	752	889	907	935	1 098	1 610	1 796	1 746	1 983	2 465
Slovenia (Euros)	366	361	406	422	463	511	498	645	737	873
Spain (Euros)	9 508	10 000	9 014	10 528	11 172	11 281	11 240	12 546	14 135	18 045
Türkiye (Liras)	29 727	32 522	38 203	47 323	68 300	79 987	93 910	116 482	203 603	339 901
United Kingdom (Pounds)	39 902	38 940	41 590	43 257	45 202	46 509	49 495	52 291	53 878	54 136
United States (US dollars)	653 942	641 253	656 059	642 933	672 255	750 886	770 650	793 990	821 830	860 000

The relations between defense and economic growth can be explained differently. One approach is proposed by “augmented Solow model” in DSW (2015) study. It intends the following Cobb-Douglas production function:

$$Y(t) = (K(t))^{\alpha} [A(t) \cdot L(t)]^{1-\alpha} (1)$$

Where $Y(t)$ denotes aggregate real income, $K(t)$ is the real capital stock, $L(t)$ is labor, and the technology parameter $A(t)$ evolves according to:

$$A(t) = A_0 \cdot e^{gt} \cdot (m(t))^{\gamma}$$

Where g is the exogenous rate of Harrod-neutral technical progress and $m(t)$ is the share of military expenditure in GDP.

Thus, the formula shows the interconnection between real capital stock, labor (which in our case should be tech-oriented mostly), technology impact and the exogeneity of technical progress over military expenditure and its share in GDP.

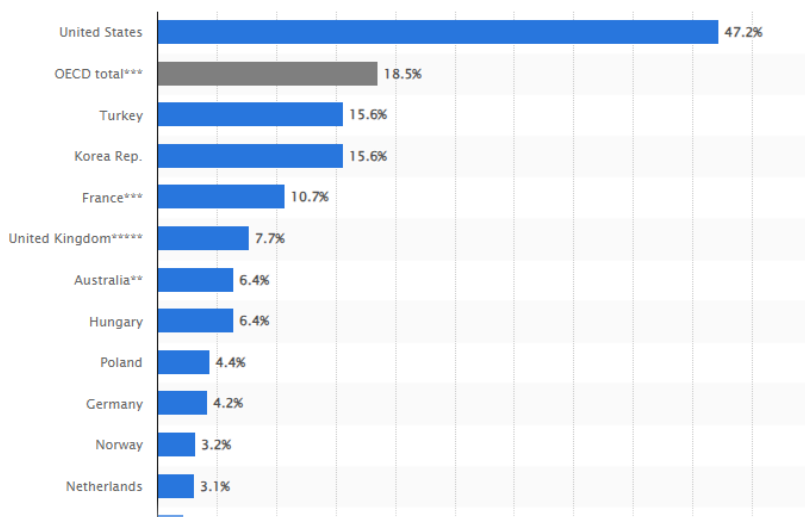
The question of a long-run economic growth through military spending has been answered by D'Agostino, G., Dunne, J. P., & Pieroni, L. (2017) negatively. Authors considered Stockholm International Peace Research Institute (SIPRI) dataset covering 170 countries (extending back to 1949 for the majority of the countries). The findings unveiled that over 20-year period, a 1% increase in military spending decreases economic growth by 9%. The negative impact was apparent for OECD member countries mainly.

In any of the possible scenarios military spendings are almost unavoidable and defense R&D comprises a sustainable part of defense industry. Though defense R&D has been criticized within the framework of economic literature because it was assumed that the defense R&D is ineffective as compared to civilian R&D yet countries have not stopped preserving the budget for military purposes (Lichtenberg, 431-457). Since World

War II defense industry has been technology-driven. However, security challenges are colossally different nowadays and military-industrial complexes of the countries face those challenges whether or not they are prepared to it.

Defense R&D spending as a percentage of total government R&D spending is a statistic that indicates the relative importance of defense R&D in each country's R&D portfolio. Figure 1 presents the steadily growth of defense R&D share in the total R&D budget indicating the continuous growth of the latter.

Figure 1 *Leading government spending on defense research and development (R&D) among OECD members in 2021, by country (in share of R&D budget)*¹



Currently defense effectiveness is mainly based on technological superiority, that is why the countries (namely United States, Western European countries) steadily increase their R&D expenditures (Cowan & Foray, 851-868). It leads to several positive effects on the overall economy. Defense R&D creates demand for highly qualified labor force (scientists, technicians, engineers) which in its turn upgrades the income and contributes to the economic growth. Cutting-edge technologies result in spillover effects for other sectors as well. Spin off technologies suggest applications going beyond the defense sector (considering also dual-use product implementation).

The radical changes brought by technologies tend to unveil scientific and technical potential supporting the legitimization of R&D. Countries necessarily need to use peacetime to generate technological opportunities (both civilian and military). As a result, new technologies and the opportunities provided by the latter have helped to debug the weapons and improve their usage in many aspects (including but not limited to resource saving, accurateness, the implications of time-bound and distance-bound modern

¹ Leading government spending on defense research and development (R&D) among OECD members in 2021, by country (in share of R&D budget)) <https://www.statista.com/statistics/1102845/government-research-development-defense-spending-oecd-country/> (last access 27.12.23)

solutions). The improved armory thus becomes more competitive in the external market and provides opportunity for defense exports. Strong defense capabilities (driven by technological superiority) can make the country an attractive supplier thus generating revenue and improving trade balance (in Armenia's case the improvement of trade balance is one of the essential issues as the import ratings colossally exceed export ratings). So, the stimulation of domestic industries and foster collaboration possibilities between defense and other sectors have all the chances to boost economic growth in the country. The collaboration between various sectors can lead to knowledge transfers and the development of human capital which in its turn will have its positive effects on the overall economy. But if we consider the case, when the country is far from having domestic defense production, we may still admit that it needs to take measurements to maintain peace and security so as other sectors for which the country has relative advantages continually serves public needs.

It is important to note, that technological opportunities are unpredictable and that uncertainty forces to avoid “undesirable” surprises. No country is willing its national security to be jeopardized since nowadays the cost of failure has proven to be extremely high (e.g., the war between Armenia and Azerbaijan over Nagorno Karabakh, the countries have definitely different degrees of preparedness to the war) and the imperative to prevent the country from “technological obstacles” has generated the idea of maintaining technological superiority in the armed forces. It helps to assess the offers of the market and as Cowan admits, “*experimenting long after a market would have standardized on one technology*” (Cowan & Foray, 851-868). In any of the possible scenarios we need to support the idea of continuous learning and improvement, since it will help later on to adopt to the technologies for civilian security and avoid unpredicted hindrances. The economic aspect of the issue lies in the fact, that no economic growth matters much if security challenges are neglected. And the winners are the countries that have defense industry as a part of their economy. On the one hand they are self-sufficient in the security maintenance, on the other hand, they create workplaces, promote R&D, support economic relations with the importer countries. One of such examples is Turkey. The defense industry of the latter is on its rise. Such countries as Saudi Arabia, Qatar, and the United Arab Emirates (UAE) are among the main importers of military equipment. SIPRI noted that Turkey's share of global arms market has doubled during the period from 2018 to 2022 reaching 1.1 percent of global arms exports (SIPRI, Trends in International Arms Transfers, 2022). Some part of the advancement is related to the adoption of new era of unmanned vehicles and their expanded production which is another power multiplier suggested by technology (SIPRI, Trends in International Arms Transfers, 2022).

Not only western countries but also Russia, India, China, Brazil have put stresses on military defense industry, thus we may suggest that the countries with military ambitions that also have somewhat enough funds are dedicated to have big share of defense budget and hence dictate their own imperatives (within the framework of global economy). US as a “big” player has also undergone certain policy changes regarding the defense and security systems. Under the secretary Donald Rumsfeld (2001-2006) US started its volumes transformations in the military defense industry.

Specifically, US military emphasized the acquisition of the following capabilities:

- Implement networked organism of command, control, communications, computing, intelligence, surveillance and reconnaissance (C4ISR) of systems,

- weapons and platforms,
- Underlined the significance of situational awareness during the war periods and beyond,
- Signified the speed, agility, flexibility and accurateness of the military operations,
- Highly appreciated jointness and interoperability. Thus, many other countries had to take the conceptual cues and consequently follow the US efforts to transform its military forces. As an indicator for future changes countries take different prisms of cooperation. Western Europe tends to take the changes and transformations through the prism of transatlantic defense cooperation and are conscious for the “pressures” from US defense suppliers (enabling cloud-centric zero trust security for defense environments).

Thus, the vast majority of the countries try to process measurements that will support their readiness for the possible threats considering the situational changes dictated by modern technologies. Wars have shown light upon the power's influence and readiness for wars among the countries that are currently at conflicts/ wars (namely Russia and Ukraine, Armenia and Azerbaijan, the Democratic Republic of the Congo and the Great Lakes, etc.). Thus, we may assume that technological advancement affects political power and economic decisions (on whether or not to fund R&D, whether or not be self-sufficient on defense industry, etc.)

As a result, these armed conflicts serve as catalysts for both participating parties and the rest of the countries (especially at the potential risk of wars) use it to reshape their military capabilities.

On the other hand, the uncertainty over the geopolitical issues and their possible consequences has made it of crucial importance to keep the pulse of technological changes (as a driving force for wars). The timely addressed compound problem of technological and resource strengthening, however, helps to somehow preserve the balance of cooperation in an optimal way.

In addition, those countries that consider their development within the ongoing technological changes will eventually experience positive effects of multioperation in other economic sectors that supply armed forces in carrying out its missions. Similarly, this concept has been underlined in the study “Transforming the Defense Industrial base: A Roadmap” by the Office Under Secretary of Defense for industrial Policy (OUSD/IP). It had in the core, that the clusters serving both civilian and defense purposes should form the basis for the national industry thus magnifying the power projection. Thus, the smaller and medium size enterprises that formerly did not supply directly to defense industry, then had the chance to become a part of the industrial-technological advancement (Bitzinger & Richard, 1-11).

Peacetime as the Best Time to Prepare for Potential Wars

During the peacetime it is indeed hard to draw countries' resources (especially when they are scarce) to the potential asymmetric threats and risks. As Donald Rumsfeld (then U.S. Secretary of Defense) stated, *“our challenge in this new century is a difficult one: to defend our nation against the unknown, the uncertain, the unseen, and the unexpected”* (Rumsfeld, 20-32). Once more proving that the changeableness of the

century and the unpredictable course of the technological advancement has prepared soil for new strategic way of defense thinking.

Revolution in the military defense industry is not only about high-tech weapons but also about processing new doctrines that will successfully employ old and modern systems. Except for ethnic problems that eventually lead to armed conflicts, there is an uncertainty regarding the identifiable enemy (since often countries do not fight against each other directly but use smaller countries for fulfilling their political or other ambitions). Thus, the organizational adaptability and flexibility for orientating towards new missions need to be planned in advance.

So why is it important to constantly finance R&D and get ready for potential wars during the peacetime? Firstly, because the enemies have the chance to access top modern technologies in the open global market, thus enhancing their military capabilities and there arises a question who will be the “fast runner” in the technological marathon. Secondly, the advancement in technologies (not only serving military purposes) definitely has its undeniable impact on the military balance, i.e., if the country starts “running” faster in regard of other technological implications then it has all the chances to easily convert its civilian capabilities into military ones and vice versa. Third, new technologies allow to avoid the traditional problem regarding the quantitative superiority due to their mass effect capabilities. The wars of the recent years have shown that the opponents are not going to challenge each other with the same weapons but are targeting the weaknesses that either side shows (e.g., the 4-day war between Armenia and Azerbaijan threw light upon the sides’ warfare and had its direct impact on the 44-day war in 2020).

Yet along with the asymmetrical threat there are still symmetrical ones and countries cannot refuse classical armament as it still remains important. The overemphasis on technology may result in underestimating other low-tech industry by which opponents could respond to either country’s technological supremacy (e.g., Chechnya and Russia conflict, where Chechnya despite its obvious low potential over Russia managed to set some of its missions).

Security - a Joint Purpose

Investing in the security market serves the purpose of “homeland” security that ensures that the rest of the economic sectors are guaranteed for longevity. Thus, the idea of a more secure world has become one of the missions that EU, UN and other organizations. In 2003 governing by the security strategy “For a Secure Europe, in a better world” European Commission has processed a research program on the topic (Centers for European policy networks). The program was planned to be implemented with a Group of Personalities (defense actors, including four main European defense firms (EADS, BAE Systems, Thales and Finmeccanica).

Thus, the European Commission decided to start a research program on security and signify the importance of establishing peace elsewhere. As part of the program, the Commission gathered a Group of Personalities, whose role would be to identify needs and research priorities and provide concrete recommendations for fulfilling the initial purpose of the research.

The Group of Personalities (experts of the field) has admitted that technology was the central component to the security, but still, *“Technology itself cannot guarantee*

security, but security without the support of technology is impossible” (Group of Personalities 6). Back then and nowadays the main ideas were (are) to be able to respond to any kind of threat with a specific type of technology.

The report also proved that civilian and defense industries are in a synergic relation (Group of Personalities 12), i.e., most of the countries prefer to produce dual-use products. Know-hows of both industries serve each other's' commercial purposes. Meanwhile the technological needs of police and military forces are common in certain noticeable aspects as well.

The ideas that UAVs can serve only as a method of mass destruction is also argued in the report, since they can also serve the purpose of maintaining security in the borders by being used by custom authorities. Thus, the interconnection between defense and civil security systems have numerous cross-applications and industries can support in a number of respects.

The fact that EU is an economic union and the challenges that it has decided to take with joint efforts motivates non-member countries join the union or at least make some steps towards it. One of such manifestations is EU-Armenia Comprehensive and Enhanced Partnership Agreement (EU-Armenia Comprehensive and Enhanced Partnership Agreement (CEPA)). Thus, we may suggest that no matter of the degree of involvement of defense sector to the civilian one, and no matter how much the countries strive for peace, yet they admit the presence of defense sector as an inseparable part of the countries industry and admit that technologies and challenges based on technology are imperative for new security and defense culture.

Conclusion

Technology has defined the military capabilities after the end of the World War II (even during the war it was already clear that future wars will be different in their nature). During the Cold War period the technological changes and the investment in the sphere was already prioritized. It was mostly conditioned by the vague political situation in the world and uncertainty of relations between countries. R&D of the defense industry gradually resulted in the evolvement of high-tech industry that served not only arm forces' needs but also civilian needs. We may admit that back then the formation of the security market started to reshape into a business model for some of the enterprises. Yet such firms needed to be put under control because of the specific nature of defense and security system. Those transformations have reshaped the economies of the countries for defense as a public good has been “funded” by the overall society (with taxes) and the technological tendencies have resulted in sustainable investment in R&D fields.

Defense has always remained a priority for the vast majority of the countries because if the defense is not properly signified by the state authorities, then the country's security and independence are jeopardized. Previously only the countries with substantial capital could afford having defense industry since defense industry was mainly referred as heavy weaponry but currently the technological advancements have led a new era in defense industry providing an opportunity for the countries with less capital and comparative advantages take certain steps towards creating a tech-driven defense industry. The main investment in this case is the investment in human capital. It logically leads to underlining defense R&D and creates the necessity to fund the field, the outcomes of which is possible to implement not only in defense industry but in other

sectors as well. Meantime tech-oriented defense industry serves as an additional source for income of the country manages to create competitive defense-related equipment not only for domestic needs but for export as well involving also highly-qualified labor force.

The countries that manage to make defense industry a part of their economy have the chance to boost economic growth since defense expenditure being unavoidable take substantial funds especially in those cases when the goods are imported but when high technologies support low- and middle-income countries to evolve defense industry the funds used to obtain defense equipment is like taking out from one pocket and putting into another one.

Currently technology is challenging armed forces with its rapid changes and there arises the issues with public spending and assurance among decision-making political leaders that the investment choices have overseen the future objectively. So, we concluded that the development of military defense industry is often a global challenge within the framework of overall security system, and though the philosophy of peace is essential for countries and organization they all separately strive for “homeland” security first. Countries are prone to take the colossal changes that happen globally and reshape the security even when they are distracted from their state agendas.

REFERENCES

1. Appathurai, James. “NATO Speech: Briefing by NATO Spokesman - MOD - 8 June 2006.” 2006. <https://www.nato.int/docu/speech/2006/s060608m.htm>.
2. Atesoglu, H. Sonmez. Defense Spending Promotes Aggregate Output in the United States: Evidence from Cointegration Analysis. *Defense and Peace Economics* 13(1), 2002, 55-60.
3. Bitzinger Richard A. “*The Revolution in Military Affairs and the Global Defence Industry: Reactions and Interactions.*” *Security Challenges*, vol. 4, no. 4, 2008, pp. 1–11. Last accessed 17 Aug. 2023
4. Christos Kollias et al. A Panel Data aAnalysis of the Nexus between Defence Spending and Growth in the European union, *Defence and Peace Economics*, 2007, 18:1, 75-85, DOI: 10.1080/10242690600722636
5. Cowan Robert and David Foray. “*Quandaries in the Economics of Dual Technologies and Spillovers from Military to Civilian Research and Development*”, *Research Policy*, 1995, 851-868.
6. D’Agostino, Giorgio et al. Corruption, Military Spending and Growth. *Defense and Peace Economics* 23(6), 2012, 591-604
7. Dunne Paul and Tian Nan, Military Expenditure, Economic Growth and Heterogeneity. *Defense and Peace Economics* 26(1), (2015) 15-30
8. Lichtenberg, Frank. “*Economics of Defense R&D*”, *Handbook of Defense Economics*, Amsterdam, b, 1995, 431-57
9. Ross Andrew L. et al. “What Do We Mean by “Transformation”?”, *Naval War College Review*: Vol. 55: No. 1, Article 3. 2002, Available at: <https://digital-commons.usnwc.edu/nwc-review/vol55/iss1/3/>

10. Rumsfeld, Donald. *“Transforming the Military”*, *Foreign Affairs*, 81 (3), 2002, 20-32.
11. Sköns, Elisabeth, et al. “Military Expenditure.” In SIPRI Yearbook 2004: Armaments, Disarmament and International Security, 35.
12. Enlargement Countries - statistics on research and development, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Enlargement countries - statistics on research and development](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Enlargement_countries_statistics_on_research_and_development) , last accessed 28.11.23
13. *Research for Secure Europe*, Luxembourg: Office for Official Publications of the European Communities, 2004
[https://www.cep.eu/fileadmin/user_upload/cep.eu/Analysen KOM/KOM 2006 474 Deckungstechniken/Bericht der Gruppe von Persoenlichkeiten vom 15-03-04.pdf](https://www.cep.eu/fileadmin/user_upload/cep.eu/Analysen_KOM/KOM_2006_474_Deckungstechniken/Bericht_der_Gruppe_von_Personlichkeiten_vom_15-03-04.pdf), Last accessed: 28 November 2023
14. Security Research, <https://eur-lex.europa.eu/EN/legal-content/summary/security-research.html>, Last accessed: 20 November 2023
15. Rise of the TIMBIs: Turkey, India, Mexico, Brazil and Indonesia
<https://www.brookings.edu/articles/rise-of-the-timbis-turkey-india-mexico-brazil-and-indonesia/>, last access Accessed: 15 October 2023
16. Conflicts to Watch in 2023, <https://www.crisisgroup.org/global/10-conflicts-watch-2023>, Last accessed: 20 August 2023
17. The Challenge of Adding Governance as a Pillar of Cybersecurity, <https://www.c4isrnet.com/>, Last accessed: 29 October 2023
18. SIPRI, “Trends in International Arms Transfers”, 2022, <https://www.sipri.org/publications/2023/sipri-fact-sheets/trends-international-arms-transfers-2022>, Last accessed: 14 September 2023
19. Enabling Cloud-centric Zero Trust Security for Defense Environments, <https://www.c4isrnet.com/>, Last accessed: 5 October 2023
20. EU-Armenia Comprehensive and Enhanced Partnership Agreement (CEPA) https://www.eeas.europa.eu/delegations/armenia/eu-armenia-comprehensive-and-enhanced-partnership-agreement-cepa_en, Last accessed: 05 November 2023

**ՊԱՇՏՊԱՆԱԿԱՆ ԱՐԴՅՈՒՆԱԲԵՐՈՒԹՅՈՒՆԸ, ԿԵՐՊԱՓՈԽՈՂ
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ՏՆՏԵՍԱԿԱՆ ԱՃԻ ԿՐԱ**

ԳՅՈՒՆՆԱՐԱ ԴԱՆԻԵԼՅԱՆ

*Հայաստանի Հանրապետության պետական
կառավարման ակադեմիայի կառավարման
ամբիոնի ասպիրանտ,
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Արդյունաբերական չորրորդ հեղաշրջման պայմաններում, տեխնոլոգիական նորարարությամբ պայմանավորված, պատերազմների վարման եղանակները կտրուկ փոխվել են: Տեխնոլոգիաները բազմաթիվ խնդիրներ են առաջացրել զլորել պաշտպանության ապագայի համար՝ ենթադրելով ռազմական կառույցների փոփոխություններ, նոր ռազմավարությունների մշակումներ, որոնք ազդում են և շարունակելու են ազդել երկրների տնտեսությունների վրա:

Հոդվածի նպատակն է բացահայտել պաշտպանական խնդիրները, որոնք հիմնված են տեխնոլոգիական նվաճումների վրա, որոնցով պայմանավորված է տնտեսական աճը, և ընդգծել պաշտպանական ԳՀՓԿԱ-ների կարևորությունը:

Հոդվածում դիտարկված խնդիրները հիմնականում վերաբերում են ժամանակակից անվտանգության մարտահրավերների շրջանակում պաշտպանական առաջատար արդյունաբերության և տնտեսական աճի վրա վերջինիս ազդեցության ուսումնասիրությանը՝ հաշվի առնելով նաև այլ երկրների կիրառելի փորձը: «Ֆիքսված» սպառնալիքների սցենարներն այլևս որոշիչ չեն պատերազմների համար, քանի որ ոլորտի արագ փոփոխությունները հակամարտությունից տուժած երկրներին ստիպում են ավելի կանխատեսելի լինել միմյանց նկատմամբ: Մեր խնդիրն է ուսումնասիրել տեխնոլոգիական փոփոխությունների մարտահրավերները և երկրների՝ դրանց հարմարվելու կարողությունը: Տեխնոլոգիաների ազդեցության տակ գտնվող պաշտպանական արդյունաբերության ընդհանրական պատկերը տալու համար կիրառվել է գիտական արժստրակցիայի մեթոդը, ինչպես նաև իրականացվել է թվային որոշ տվյալների քանակական և որակական վերլուծություն:

Այսպիսով՝ ուսումնասիրությունը բացահայտում է, որ ռազմական պաշտպանության հետ կապված ժամանակակից տեխնոլոգիաների կարևոր առանձնահատկությունները, որոնք կապում են մարդկանց, զենքերը, սենսորները, արհեստական բանականությամբ որոշումներ կայացնելու համար նախատեսված սարքավորումները, ի վերջո հանգեցնում են արագության, համաժամացման և զանգվածային էֆեկտների զգալի աճի, ինչպես նաև անհերքելի ազդեցություն են ունենում երկրի տնտեսության վրա:

Հիմնաբառեր՝ *պաշտպանություն, տնտեսություն, անվտանգություն, տեխնոլոգիա, հետազոտություն և զարգացում, խաղաղություն, զինված ուժեր:*

ТЕХНОЛОГИЧЕСКИЕ ВЫЗОВЫ, ФОРМИРУЮЩИЕ ОБОРОННУЮ ПРОМЫШЛЕННОСТЬ, И ИХ ВЛИЯНИЕ НА ЭКОНОМИЧЕСКИЙ РОСТ

ГЮЛЬНАРА ДАНИЕЛЯН

аспирант кафедры управления

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Оснащенные технологическими инновациями способы ведения войн в наши дни кардинально изменились, особенно после 4-й промышленной революции. Технологии поднимают множество вопросов для будущего глобальной обороны, начиная от изменений в военных структурах до стратегий, которые в конечном итоге влияют на экономику стран в целом. Цель нашей статьи – раскрыть некоторые проблемы обороны, основанные на технологических достижениях, которые служат

движущими силами экономического роста, и подчеркнуть важность оборонных исследований и разработок.

Проблемы, рассматриваемые в статье, в основном относятся к изучению оборонной промышленности в рамках современных вызовов безопасности и их общего влияния на экономический рост (с учетом применимого опыта других стран).

Сценарии «фиксированных» угроз больше не являются определяющими для войн, поскольку быстрые изменения в военной сфере заставляют страны, вовлеченные в военные конфликты, быть более предсказуемыми в отношении друг друга. Наша задача состоит в изучении вызовов, связанных с технологическими изменениями, и способности стран адаптироваться к ним. Чтобы дать целостную картину оборонной промышленности, оснащенной технологиями, мы использовали метод научной абстракции, также провели количественный анализ данных и качественный анализ взаимосвязи между обороной и экономикой.

Таким образом, исследование показало, что важные особенности современных технологий, связанных с военной обороной, которые связывают людей, оружие, датчики, платформы, оборудование для принятия решений на основе искусственного интеллекта и в конечном итоге приводят к значительному увеличению скорости, синхронизации и обеспечивают массовые эффекты, бесспорно оказывают влияние на экономику страны.

Ключевые слова: *оборона, экономика, безопасность, технологии, исследования и разработки, мир, вооруженные силы.*