ESSAY

The reconstruction and new role of the defense industry in Central Europe - experiences from the war in Ukraine

Łukasz Gołota

Political Science and International Studies, University of Warsaw, Warsaw, Masovian Voivodeship, 02-927, Poland

Abstract

This paper presents two major issues. Firstly, the impact of Russian aggression on how security is perceived in Central Europe, and secondly, the importance of changing security policies, with a special focus on the defense industry. Our findings in these areas will permitus to answer the main question of the research - on the reconstruction and new role of the defense industry in Central Europe since Russia invaded Ukraine in 2022. The arms industry was one of the pillars of the Cold War economic and political system, and was a crucial asset in the blocks' rivalry. The collapse of the Soviet Union marked the beginning of a structural transformation in Central Europe. Released from the Soviet grip, countries in the region turned to Western institutions and became an important part of them. The year 1989 seemed to close a period of tough historical experience, and the 30 years that followed were a time of peace and growing prosperity. Yet a resurgence of Russian imperialism brought old anxieties back to the surface and ultimately caused Europe's architecture of security to falter. Russia's invasion of Ukraine in 2022 released the demons of the past, and has seriously reoriented politics - not only in Central and Eastern Europe.

Keywords

Defense industry, war, invasion, security Central Europe, industry policy

Corresponding author: Łukasz Gołota (l.golota@uw.edu.pl)

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Introduction

The Russian invasion of Ukraine is the first instance of an imperial war in Europe since 1945; it aims to conquer territory and destroy the sovereignty of another state. The unprovoked and illegal attack definitively ended the post-Cold War order, which had been based on compromises and institutions. Surprised and shocked members of the Euro-Atlantic community must now face the fact that a new chapter in history has been opened.

For many reasons, the war has especially affected Central European States (CES),[1] for: they are geographically closest to the conflict, they have historical experience with Russia as a neighbor, their present relations with Russia are full of tensions, and they used to be victims of Russian imperialism (whether tsarist or communist). Wilno, Warsaw, Prague or Tallin can have a more accurate view of Central and Eastern European affairs than their Western partners. EU Commission President von der Leyen's statement that "We should have listened to the voices inside our Union – in Poland, in the Baltics, and all across Central and Eastern Europe" confirms this.[2] Previously, Central European views and perceptions had been treated on a par with those of the "older" EU and NATO members.

Vladimir Putin's "special military operation" was planned to last a couple of days, but has turned into a regular, full-scale war. It has also caused a complete re-evaluation of international principles of order and security. The socio-economic life of Ukraine is now fully involved in the war. Ukraine's allies, especially those in Central Europe, have been contributing mainly in the military sector, but politically they have also been forced to reconsider their own ideas about security. This paper explores the changes that have taken place, and answers the questions: What have been these changes in perception? What has been their impact on the defense industry in Central Europe?

The paper fills a research gap, for, by force of circumstance, previous studies are no longer up to date. The factors contributing to the new international reality include:

- a decomposition of the security system in Europe as a result of the disruption of the post-Cold War status quo;
- accelerating structural and geopolitical shifts that are exacerbating tensions;
- the growing political importance of Central Europe since the enlargement of NATO in 1999;[3]

[1] In this paper CES means the group of post-communist countries which, taking advantage of the collapse of Soviet Union, quitted socialistic structures and reoriented their developmental paths towards the Western economic and political model: Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Hungary, Bulgaria and Romania.

[2] U. von der Leyen, "2022 State of the Union Address by President von der Leyen," September 14, 2022, https://ec.europa.eu/commission/presscorner/detail/en/speech_22_5493.

[3] G.J. Schmitt, "Poland, Hungary, and the Czech Republic: The Security Record of "New Europe"," American Enterprise Institute, 2016, http://www.jstor.org/stable/resrep03262.

- a new state of awareness - NATO members have woken up to the shortages they have in their military systems and ammunition supplies, and to their dangerously limited capabilities for replenishment and production. The weakness of the European defense industrial base has now emerged as a real problem for the NATO alliance. Europe's defense industrial base, in short, is not fit for purpose. This has been recognized as a problem on both sides of the Atlantic;[4]
- growing concern about the imperfections and weaknesses of collective defense;
- the determination of the CES to take on greater responsibility for their own security.

Although the paper covers the whole of Central Europe, the defense sectors in the region have different potential, and are structured differently, so most attention will be paid to the most heavily involved countries: Poland and the Czech Republic, in which, according to official data, seven of the ten biggest military CE companies are located. Those two countries play actually a main role in armory production in the region. The leader, Polish Armaments Group, employs over 50% of the workers and generates around 40% of the revenue among the top ten companies. As we can see below the entire sector noted a huge increase of revenues (Table 1).

Table 1. Top 10 Defense Companies in Central Europe: 2022 (Source: 5, Defense - Aerospace.com, December 2023).

Rank	Company	Country	Number of employees	Revenue, 2022 (USD millions)	Revenue, 2021 (USD millions)	Reveue change 2021–2022
1	Polish Armament Group (PGZ)	Poland	18272	1874	1646	13,90%
2	Czechoslovak Group (CSG)	Czech Republic	5450	1067	666	60,20%
3	Colt CZ Group	Czech Republic	2205	625	493	26,70%
4	STV Group	Czech Republic	324	278	64	336,60%
5	Vazov Machine - Building Plant (VMZ)	Bulgaria	3973	273	116	135,30%

[4] M. Bergmann and O. Svendsen, "The Transatlantic Strategic Landscape," in *Transforming European Defense: A New Focus on Integration*, Center for Strategic and International Studies (CSIS), 2023, 7–21, http://www.jstor.org/stable/resrep51361.5.

[5] D. Kimla, "Top 10 Defence Companies in Central Europe: 2022," 2023, https://www.defense-aerospace.com/top-10-defence-companies-in-central-europe-2022/.

Rank	Company	Country	Number of employees	Revenue, 2022 (USD millions)	Revenue, 2021 (USD millions)	Reveue change 2021–2022
6	Aero Vodochody AEROSPACE	Czech Republic	1600	227	114	98,20%
7	ROMARM	Romania	1328	162	32	413,80%
8	DMD Group	Slovakia	612	143	131	9,20%
9	WB Group	Poland	1109	135	89	52%
10	Remontowa Shipbuilding	Poland	345	71	129	-44,80%

For comparison, none of the Baltic state owns any separate defense industry. Lithuania has a few electronics companies that provide services to the army, such as Elsis and Euroelektronika. Latvia has engaged its shipbuilding industry in building patrol boats for the Navy (in the Riga shipyard). With their existing technical resources, the Baltic states can perform basic inspections and minor renovations of some equipment, but they are completely dependent on external supplies.[6]

Central European countries have a more limited production base and less potential than their Western partners. Nevertheless, their role is invaluable: they constitute the direct technical backup for the front in Ukraine, and they are responsible for the most demanding part of that support: servicing, repairs, reconstruction, and damage removal.

The military sector is not just about manufacturing arms and supplying the army. There is a broader context. Firstly, the sector is always part of national security policy. Secondly, it functions within the whole economy, which means that, even though politics dominate, it still must coexist with the laws of the market. Thirdly, it must comply with the military doctrines and strategies in place. And finally, because of the privileged treatment it receives, it can be a source of innovations that impact civilian markets and overall development.[7]

Studying the defense industry is still a painfully slow and difficult undertaking. Crucially, there was an increase in transparency in the sector after 1989. But although lots of fact and figures can now be found in official documents and statements, the specific nature of the sector casts doubts on their reliability. These are still sensitive data, often presented as political declarations, parts of military doctrine - or just wishful thinking. This paper is based on many sources that presented sometimes

[6] J. Gostkowska and O. Osica, "Closing the Gap? Military co-operation from the Baltic Sea to the Black Sea," OSW Report, 2012.

[7] R. Stohl and S. Grillot, *The International Arms Trade* (Polity Press, 2009).

contradictory data: official documents, statements, technical reports, academic papers, interviews, press releases and articles.

Theoretical framework and methodology

The reconstruction and transformation of the defense industry in Central Europe following the Russian invasion of Ukraine in 2022 can be better understood when placed in the context of established theories of international relations and security studies. Classic realist theories assume the primacy of state power. The main determinant of states' policies is survival and the centrality of power in international politics.[8] For Central European States (CES), the war in Ukraine reactivated traditional realist concerns about territorial integrity and sovereignty. The rapid rearmament programs and investment in domestic arms production illustrate how states respond to a perceived security dilemma. This theoretical framework provides a lens through which to grasp the reconfigurations that have taken place in the policies of these states. The profound transformations within the defense industry serve as symptomatic evidence of the emergence of a new security architecture, shaped by the foundational premises of realism.

This article employs a comparative case study design to analyze the reconstruction and new role of the defense industry in Central Europe following Russia's invasion of Ukraine. The focus is on Poland and the Czech Republic, which together account for the majority of Central Europe's defense production. According to available data, seven of the ten largestdefense firms in the region are based in these two countries. Poland hosts the Polish Armaments Group (PGZ), the single largest employer and producer in the region, while the Czech Republic has a long tradition of arms exports and remains a critical logistics hub. Other CES states (such as Hungary, Romania, or Bulgaria) are discussed for comparative purposes, but Poland and the Czech Republic serve as the primary cases due to their disproportionate industrial and strategic importance.

The comparative case study method allows for the identification of similarities and differences between Poland and the Czech Republic, highlighting how structural conditions, alliance commitments, and domestic political choices influence defense-industrial policies. The analysis links empirical developments (such as arms production increases or export growth) to theoretical debates in realism.

Post-cold war Central Europe

The Yalta compromise sentenced the Central European states to the status of Soviet satellites and to membership in the Warsaw Pact, which hosting Russian troops. Their political subjection to the Soviet Union entailed not only an alliance with the Red Army, but also the support of their economies for the production of huge volumes of military equipment for the Pact's forces. Soviet leaders never considered the

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[8] H. Morgenthau, *Politics Among Nations: The Struggle for Power and Peace* (New York: Alfred A. Knopf, 1948).

possibility of the fall of the Eastern Bloc, and so military manufacturing was spread out among the socialist countries. Core production was in the USSR itself, but many countries were further links in a sophisticated production chain, and this led them to develop specific competences in arms production that turned out to be more durable than the system itself.

After the Soviet Union collapsed, the region struggled to reidentify itself in its new international surroundings. The Russian Federation focused on its own transformation, developing formulas for cooperation with its "near and far abroad".[9] The Red Army slowly drew back from the satellite states to the motherland: from Czechoslovakia and Hungary in 1991, from East Germany in 1994. The last Russian troops left Poland on 17 September 1993 (a very symbolic day, for it was on 17 September 1939 that the Soviet Union invaded Poland). The countries of Central Europe all quickly changed course towards Western economic (European Union) and military (NATO) structures.

The agony of the Soviet Union caused a thaw in international relations. Looking for a new order, countries agreed to intensify disarmament processes, with one result being the Treaty on Conventional Armed Forces in Europe (CFE) in 1991, widely referred to as a cornerstone of European security. The treaty played a key role in limiting the size of conventional military forces in Europe.[10] But for ex-members of the Warsaw Pact, it involved a lot of commitments. The USSR's strategy of a massive use of military equipment in a potential war with NATO had resulted in its having a huge quantitative advantage in military systems. In other words, in the new reality the CES found themselves over-armored. They had to make huge reductions. At the same time, the region pushed through challenging economic and political reforms to meet high Western standards. The pain and effort paid off. Historic breakthroughs came in 1999 (NATO enlargement) and 2004 (EU enlargement), dates that seemed symbolically to bring an end to the Cold War's half a century of a divided Europe.

These enlargements gave a sense of stability and security to the whole Euro-Atlantic region. Russia stopped being perceived as a an enemy and was drawn into many forms of cooperation, such as the Founding Act on Mutual Relations in 1997, and the NATO-Russia Council launched in 2002.[11] This somewhat reluctant cooperation was strengthened by the threat of global terrorism. But Westerners were deceived by the charm of this strange partnership, and took an indulgent view of the signs that were appearing of Russian "re-imperial" ambitions: bullying the neighborhood, engaging in energetic blackmailing, or making doubtful geoeconomic

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[9] O. Shevel, "Russia and the Near Abroad," *Great Decisions* (2015): 5–16, http://www.jstor.org/stable/44214789.

[10] B.C. Rydmark, "The Future of the CFE Regime: Consequences for European Security," Norwegian Institute for Defence Studies, 2010, http://www.jstor.org/stable/resrep25803.

[11] A. Franekova, "Uneasy Expansion: NATO and Russia," *Harvard International Review* 24, no. 3 (2002): 10, 11, http://www.jstor.org/stable/42762829.

investments such as Nord-Stream. This renewal of Russian imperial aspirations increased security concerns in Central Europe, and Russia's aggressive, expansionist policy, with critical turning point in 2008, 2014 and 2022, have caused many to once again see Russia as an existential threat again.[12]

Arms industry under transition

Although the transformation was ultimately successful, the process was difficult and painful for many sectors and groups. The economic transformation meant a total reconfiguration of the conditions of production and distribution. Central planning, enormous subsidies, state ownership and party-dominated management were replaced by a free market, deregulation and privatization. A key element in this reshaping of policy was to rebalance the extent to which the public and private sectors contributed to the national economy. Reducing the very high level of national resources allocated to military spending became a priority in the transformation.[13] The defense industry did not constitute an exception, and could not count on preferential treatment. When the economies of Central Europe encountered problems and turbulence, arms production was affected. Essentially, when the old system collapsed, military production collapsed with it.

Moreover, the end of the Cold War brought many striking changes to the global structure and nature of the arms industry. The reduction in demand caused new trends such as the consolidation, concentration, privatization and diversification of production. At the end of the Cold War, arms industry was not very concentrated, with the top five companies accounting for 22% of total arms sales. By 2003, this had changed significantly, with the top five firms accounting for 44 % of total sales.[14]

The military industry had to adjust to new, free-market conditions: limited subsidies, global competition, new private-owned players. The legal and business environment changed completely. There were long and difficult legal and commercial transformations. Companies tried to find the most effective formulas, thrown between turbulent, often contradictory, processes of privatization, consolidation, fragmentation, bankruptcy and foreign acquisitions. These caused uncertainty of demand, reduced employment and shortages in financing. The entire region suffered. The research, development, and production potential of the region's domestic defense industries declined as a result of restructuring, and the privatization of state-owned factories.[15]

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[12] I. Krastev and M. Leonard, "The Crisis Of European Securtiy: What Europeans Think About The War In Ukraine," European Council on Foreign Relations, 2022, http://www.jstor.org/stable/resrep39678.

[13] Y. Kiss, *Arms Industry Transformation and Integration – the choices of East Central Europe* (Oxford University Press, 2014).

[14] A. Bitzinger, *The Modern Defense Industry* (ABC Clio Publishing, 2009).

[15] J. Prochazka, "The Defense Policy of Czechoslovakia and the Czech Republic Since 1989: Stages, Milestones, Challenges, Priorities, and Lessons Learned," *Connections* 8, no. 2 (2009): 17–34, http://www.jstor.org/stable/26326167.

Moreover, the sense of stability and security led to a marginalization of a sector which, by many, was perceived as a relic of the former era of militarization and sovetization. So the sector faced problems having two sources and two dimensions: political and economic, external and internal.

Arms production did recover, though, and the military sector came to be an acknowledged and even widely appreciated part of the new system, a key reason being that the CE countries became NATO candidates. Full membership in the Pact required the unification and standardization of the new members' armies, which could only be achieved by increasing military spending and re-legitimizing the military establishment.

But even after this partial resurrection, by volume and value of production the Central European arms industry was still at the periphery of the global market, and is not a prominent economic engine in any of the countries of the region.[16] The biggest company of the region– Polish PGZ – was ranked 71st in the SIPRI World Ranking 2022.[17] Unlike global producers, regional producers had no capability of creating innovative, highly advanced products. Instead, they focused on developing and upgrading post-Soviet technologies. Further, there were no transfer lines between military and civil markets.[18] Experience and observation allow us to formulate the thesis that military spending supports the economy if it generates technological development that can be applied in the civilian sectors.[19] In Central Europe, therefore, the defense sector was not treated as a strategic branch because it was neutral for the economy.

Impact of Russia's aggression against Ukraine

The Russian invasion of 2022 was totally condemned by all the CES. On the day of the attack on 24 February, non-official and official statements of indignation appeared throughout the region f.e.: Bulgaria,[20] the Czech Republic,[21] Hungary,[22]

[16] Kiss, *Arms Industry Transformation and Integration – the choices of East Central Europe*.

[17] SIPRI, "The SIPRI Top 100 arms-producing and military services companies in the world, 2022," 2023, https://www.sipri.org/visualizations/2023/sipri-top-100-arms-producing-and-military-services-companies-world-2022.

[18] Podcast Spraw Zagranicznych, "Gen. Skrzypczak: Polski Przemysł Zbrojeniowy - niewykorzystany potencjał," 2022, https://www.youtube.com/watch?v=FJF-rMtifMg.

[19] U. Heo, "The Relationship between Defense Spending and Economic Growth in the United States," *Political Research Quarterly* 63, no. 4 (2010).

[20] K. Petkov, "Bulgaria's Government strongly condemns the aggression of the Russian Federation against Ukraine," 2022, https://www.gov.bg/special/en/Press-center/News/Prime-Minister-Kiril-Petkov-Bulgaria's-Government-strongly-condemns-the-aggression-of-the-Russian-Federation-against-Ukraine.

[21] M. Zeman, "Russia has committed a crime against peace," 2023, https://apnews.com/article/russia-ukraine-russia-hungary-prague-czech-republic-dfe9b03ce3553e899da79e4974fd93d7.

[22] V. Orban, "Together with our European Union and NATO allies, we condemn Russia's military action," 2022, https://apnews.com/article/russia-ukraine-russia-hungary-prague-czech-republic-dfe9b03ce3553e899da79e4974fd93d7.

Poland,[23] Romania (Twitter user ID: 2765824141; Tweet ID: 1496698173070446592). The official statements were shortly followed by concrete action. Almost the whole region (except for Hungary) made a lot of effort to support Ukraine. Without hesitation, weapons and humanitarian aid began flowing into Ukraine. The region became a leader in support in relation to GDP. Many countries unconditionally opened their borders to refugees. At the same time, CES governments took the lead in imposing sanctions against the aggressor (closing their airspace, blocking transfers of people and goods, non-economic pressure, etc.).[24]

The attack on Ukraine confirmed long-standing belief in the CES that the Russian Federation poses an existential threat to security and peace in Europe. Moreover, these countries were terrified and disappointed with the slow and, in their opinion, insufficient reaction of their Western allies. As the conflict dragged on, they came to realize that, to be secure, they must be able to defend successfully themselves for a longer period of time.[25] That meant a fundamental change in their security policies. They are now prioritizing purchasing equipment abroad and developing own arms production.

The war in Ukraine has triggered a boom in Europe's defense industry. Military budgets worldwide rose by 3.7%, to $2.2trn. In Europe, they increased by 13%, faster than in any other region. Growth was particularly pronounced in those countries closest to Russia.[26] After over 30 years of peace and prosperity, the defense sector has once again become a real strategic industry with new goals, capabilities and policies.

The new industrial policy in Central Europe must be considered as part of the broader Euro-Atlantic strategic partnership. As long as the USA and its European allies cannot clearly work out each's responsibility for security, industrial policy pays a price. The core of the issue is that Washington lacks a clear strategic vision for Europe and what it wants Europe's role in world affairs to be.[27] The US has not decided whether to remain indispensable to European security or have its transatlantic allies take on greater responsibility. These alternatives lead to very different policy choices. What is worse, the countries of Europe seem unable to speak the same language when defining their responsibilities towards each other, as well as towards the US. This precludes any harmonization in their military industry policies.

[23] R.P. Sejm, "Oświadczenie Sejmu Rzeczypospolitej Polskiej z dnia 24 lutego 2022 r. w sprawie agresji federacji rosyjskiej na Ukrainę," MP 2022 poz. 284, 2022.

[24] The Polish national team refused to play against Russia in the qualifying round to the Football World Cup 2022.

[25] K. Turecki, "Herold apokalipsy," Radosław Sikorski ujawnia szczegóły spotkania w Monachium, 2022, https://wiadomosci.onet.pl/tylko-w-onecie/wojna-rosja-ukraina-radoslaw-sikorski-ujawnia-szczegoly-spotkania-w-monachium/t1xtqt5.

[26] "War in Ukraine has triggered a boom in Europe's defense industry," *The Economist,* August 17, 2023, https://www.economist.com/business/2023/08/17/war-in-ukraine-has-triggered-a-boom-in-europes-defence-industry.

[27] Bergmann and Svendsen, "The Transatlantic Strategic Landscape."

This is a source of huge problems. The European Defense Agency (EDA) has identified industrial fragmentation as a major problem in European defense, as shown by the proliferation in the number of systems in operation. A 2017 McKinsey analysis based on reporting from the International Institute for Strategic Studies found that, in selected categories, EDA members had 178 different versions of weapons systems, compared to only 30 variations in the United States.[28] This is highly indicative of a lack of any cooperation in this field. The CES decided they couldn't wait for a European mechanism and launched their own policies without any consultations, separately.

Poland

Warsaw's reaction towards Russia's aggression included multilevel support delivered – which was crucial at the beginning of the invasion – without a moment's hesitation or delay. Unlike France or Germany, Poland made a huge effort to support Ukraine and Ukrainians. The Polish army and defense industry donated impressive numbers of heavy equipment to the Ukrainian army (over 300 T-72B and PT-91 tanks, BWP1 infantry armored vehicles, Grad rocket artillery, KRAB self-propelled artillery, MSBS GROT ammunition, FlyEye and Warmate drones, personal equipment). That was significant when the Russian army was moving towards Kyiv.

The Polish defense industry had everything required to become a main military hub: know-how, capacity and potential. It operated to NATO standards, and was competent in servicing post-Soviet military hardware. Finally, it had developed technologies for unifying Western and Eastern standards; this has had a big impact on the conflict (by synchronizing NATO bombs and rockets with post-Soviet aircraft).

Most companies from the Polish defense sector noted record turnover in 2022–23, and the volume of exports is constantly growing.[29] In 2022, Polish Armaments Group (the country's biggest arms producer) saw an increase in revenue of almost 30% over 2021, and achieved a turnover of PLN 8.35 billion. Exports accounted for PLN 1.48 billion, or 18.6% of the total. In the previous year that figure was only 11.2%. This significant increase is, of course, a consequence of the war in Ukraine.[30] In 2023, the group's revenue reached PLN 13.5 billion.[31] In fact, 2023 saw the largest contracts ever, including for ammunition, military hardware and software, hi-tech products, and personal equipment.[32] Many of those contracts were

[28] G. Sanders and N. Velazquez, "Pivoting to Production?: Europe's Defense Industrial Opportunity," in *Transatlantic Defense During Wartime: A Companion Volume To The 2023*, 2023.

[29] "Rośnie eksport polskiej broni? Bejda: Otwieramy nowe rynki na MSPO," *Defense24*, 2023, https://www.youtube.com/results?search_query=polski+przemysł+zbrojeniowy.

[30] A. Pawlowska, "Świat zaczął liczyć się z naszą zbrojeniówką. Kraby to hit, trotyl biorą w każdych ilościach," Business Insider Polska, 2024.

[31] PGZ, "Strategia Grupy Kapitałowej PGZ 2024–2033," 2024, https://grupapgz.pl/o-nas/misja-i-wizja/.

[32] G. Olsztyńska, "Rozwój przemysłu zbrojeniowego w Polsce: Rozmowa Marka Budzisza z prezesem PGZ Sebastianem Chwałkiem," 2023, https://www.youtube.com/watch?v=bXDN8FVLIHU.

signed with foreign partners who committed to sharing advanced technologies. The government made many policy changes and subsidized the development of production capacity, as a result of which, so far, there have been:

- significant quantitative growth in production;
- international recognition of product quality (artillery, very short-range defense systems, drones)
- access to new markets, including in "old" NATO members;
- increased revenue (e.g., in 2022, for the first time since being taken over by Polish Armaments Group, PGZ War Shipyard recorded a positive financial result);[33]
- an accumulation of non-government-dependent capital, consumed in R&D;
- unprecedented investments in production capacity;
- innovation transfers within overseas purchases (USA, South Korea);
- a growing role in NATO's military production capacity.

Czech Republic

The well-developed arms industry of the Czech Republic dates back to the Austro-Hungarian period, when it constituted the main industrial base for the monarchy. The country played a similar role in the political plans of the Third Reich, and during the Cold War its importance did not decrease. According to data collected by SIPRI (Stockholm International Peace Research Institute), in the years 1950–1992 Czechoslovakia was the sixth-largest arms exporter in the world. After the collapse of the bipolar world order, the Czech Republic's arms industry lost its global importance. Nevertheless, its average exports in the years 1992–2022 put the Czech Republic in 21st place among arms exporters. Considering the size of the country itself and of its economy, this is impressive.[34]

The potential of the Czech Republic's arms industry has become an important source of military support for Ukraine, support that includes the production, service and repair of weapons and ammunition supplies. Like Poland, the Czech Republic played a significant role at the beginning of the conflict when, without any hesitation, it decided to support Ukraine. In the first few weeks, when the odds were in the balance, the Czech Republic sent significant amounts of military equipment and ammunition. In 2022, the export value of the Czech arms sector doubled over the previous year and reached a value of CZK 30 billion. 45% of those exports went to Ukraine. The sale of ammunition, mainly large-calibre, accounted for as much as 70% of Czech exports to Ukraine.

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[33] Z. Lentowicz, "Stocznia z Oksywia nareszcie z zyskiem," *Rzeczpospolita*, July 28, 2023.

[34] J. Bornio, "Przemysł zbrojeniowy i wsparcie militarne Republiki Czeskiej wobec Ukrainy," Komentarze Instytutu Eurupy Środkowej 981 (229/2023), 2023.

The war in Ukraine has allowed the export-oriented arms industry of the Czech Republic to grow and generate profit. The prospect of a prolonged war generates a need to ensure that the supply of arms continues. The Czech Republic has significant technological and production potential and, importantly, is a logistics base that is both located close to the conflict zone and at the same time - thanks to allied guarantees – is resistant to attacks that could disturb the stability of supplies. The political and military capital that the Czech Republichas invested in Ukraine is bringing tangible benefits in the form of closer cooperation between the arms industries of the two countries. We can expect these relations to continue and deepen in the coming months.[35]

Hungary

Hungary's approach towards the war in Ukraine has been ambivalent. Hungary is a NATO and EU member, but many of its positions differ a lot from the official positions of those organizations. It blocked weapons transfers through its territory[36] and chronically questions European financial aid for Ukraine. In Hungary, Russia is not perceived as a threat as it is in other Central European states. Ukraine has even been called a hostage of Viktor Orban's domestic and foreign policies.[37]

According to defense minister Kristóf Szalay-Bobrovniczky, the government aims to make Hungary Central Europe's top defense industry hub for production and R&D.[38] The country has strengthened international cooperation, especially with German partners, who have become a main supplier of arms to it. An integral part of such contracts is technology transfers to Hungary.

A good example of this approach is an order for 209 Lynx KF41 vehicles in seven variants. Only 46 will be produced in Germany. The rest will be manufactured in Rheinmetall's ultramodern facility in Zalaegerszeg opened in August 2023. According to the manufacturer, this factory will develop and produce state-of-the-art wheeled and tracked armoured fighting vehicles for the Hungarian armed forces, including the Lynx KF41 family and the Evo version of the Panther KF51 main battle tank.[39]

The war in Ukraine has not had a great impact on the Hungarian defense industry. Budapest has been consistently upgrading its army and technological

[35] Bornio, "Przemysł zbrojeniowy i wsparcie militarne Republiki Czeskiej wobec Ukrainy."

[36] L. Bayer, "Hungary refuses to allow weapons transit to Ukraine," Politico, 2022.

[37] K. Verseck, "Hungary: What's Viktor Orban's problem with Ukraine?," Deutche Welle, 2022, https://www.dw.com/en/hungary-whats-viktor-orbans-problem-with-ukraine/a-64063750.

[38] "Hungary Aims to Become a Major Defense Industry Center," *Hungary Today*, 2022, https://hungarytoday.hu/hungary-aims-to-become-a-major-defense-industry-center/.

[39] Rheinmetall Press Release, "Capacity expansion: Rheinmetall builds first Lynx infantry fighting vehicle for Hungary in Hungary," 2023, https://www.rheinmetall.com/en/media/news-watch/news/2023/12/2023-12-21-first-lynx-infantry-fighting-vehicle-produced-in-hungary.

facilities under a comprehensive military modernization and rearmament program: "Zrínyi 2026", launched back in 2017. Under this program, all of the Hungarian Defense Forces (HDF) will be brought up to 21st-century standards.

Romania and Bulgaria

Under the division of labor in the military sector within the Warsaw Pact, in Poland the leading players were plants producing tracked and wheeled vehicles, as well as the aviation and electronics industries. Czechoslovakia specialized in aircraft and artillery equipment, Hungary in electronics, and Romania and Bulgaria in ship and automotive transport production.[40]

Romania has also implemented an ambitious arms program. On one hand, it is making expensive foreign military purchases, with a budget of over EUR 10 billion. The vast majority of that will be spent on modernizing air defense.[41] On the other hand, Romania is investing in its own industry. According to the Romanian Ministry of the Economy, investments in new production lines will be made in plants in Cugir, Sadu, Tohani, Plopeni and Dragomiresti, such that the production capacity of Romanian ammunition factories will be quadrupled.

"The analyst said around 40% of Romania's new military budget will be allocated to buying new weapons to replace Soviet-era gear, and the government intends to use a sizable portion of this spending to upgrade local manufacturing capacity, which has languished for years due to mismanagement and underinvestment".[42]

Bulgaria also has a program for modernizing its army, based mostly on foreign purchases. Sofia has not come up with a large program for developing the domestic sector. Noticeably, Bulgaria specializes in producing ammunition for Soviet-era weapons,[43] and its arms industry has never had it so good, with exports in 2022 estimated at USD 4.3 billion -- three times the previous record.

Conclusions

The development of the defense industry in Central Europe must be considered in the broader, European (EU) and Euro-Atlantic contexts, where the current weakness of the European defense industrial base has meant that European defense companies are unable to meet demand and deliver systems promptly.[44]

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[40] M. Szlachta and A. Ciupiński, "Od politycznej współpracy do gospodarczej konkurencji – przemysł obronny krajów Europy Środkowo-Wschodniej po upadku ZSRR," Rocznik Instytutu Europy Środkowo-Wschodniej, 2021.

[41] B. Kucharski, "Rumunia się zbroi," Zespół Badań i Analiz Militarnych, 2023, https://zbiam.pl/rumunia-sie-zbroi/.

[42] J. Adamowski, "Romanian government readies fighting vehicle, howitzer deals in 2024," 2024, https://www.defensenews.com/global/europe/2024/01/22/romanian-government-readies-fighting-vehicle-howitzer-deals-in-2024/.

[43] "'Guns and Roses': Bulgaria arms trade booms on Ukraine war," France 24, March 22, 2023, https://www.france24.com/en/live-news/20230322-guns-and-roses-bulgaria-arms-trade-booms-on-ukraine-war.

[44] Bergmann and Svendsen, "The Transatlantic Strategic."

Theoretically, investing in defense is justified domestically by appealing to the national interest, which includes remaining in solidarity with the alliance, recognizing the importance of collective security, and defending European interests. When the USA and its European allies cannot clearly define the scope of their responsibility for security, industrial policy falls victim. Modernization programs are then implemented independently by different states, with no coherent joint strategy. Taking all this into final consideration, we conclude with seven points.

1. The defense sectors of the CES have benefited economically from the Russian-Ukrainian conflict. After a tough period of transformation, they have again become strategic assets with a future.
2. There is growing recognition of the quality of military products made in Central Europe. The Ukraine war has grabbed the attention of military markets. The little-known products of the CE economies have proved their quality and effectiveness in Ukraine. Satisfied customers and a strong reputation won in the field mean more than marketing campaigns. The first contracts have been signed, and defense companies are pledging to step up production.
3. Central European companies are gaining new export destinations. We can observe a shift from smaller emerging markets in Asia and Latin America towards developed economies (NATO customers).
4. The CES have come to realize the importance of having a defense industrial policy, which implies a growing role for the defense industry in the whole concept of security.
5. Long-term demand and huge investments in the sector guarantee stability and growth. State agencies aim to stimulate progress through tenders and regulations. The results of those types of activities were rather modest up to the outbreak of the war in Ukraine.
6. The arms sector finally became a big beneficiary of government R&D funds. Moreover, the sector's first successes let it generate its own financial assets, assets that can be reinvested in technological development. In the long term, defense companies may come to play a bigger role in the whole economy and send impulses for innovation to other sectors.
7. There is a growing relation between security policy and the development of a domestic defense industry that is as self-sufficient as possible. Governments have become a key driver in planning and management.

It should be underscored that the war in Ukraine has produced a cognitive shock within the field of international relations. The contemporary international environment is increasingly interpreted through realist paradigms, emphasizing the centrality of power, security, and geopolitical competition. Crucially, this shift has manifested itself in concrete state policies, with the most salient illustration being the transformative dynamics currently unfolding in the defense industries of CES.

The year 2022 was a sad year in the history of Europe. While the war has been broadcast and widely commented on, misperceptions and disregard for the gravity of the situation continue, when an accurate understanding is the first step towards an appropriate response. One of the war's most important results has been the emergence of a new security architecture in Europe. The new defense policies in Central Europe confirm how seriously the countries of the region are treating those changes, and how they are striving to act responsibly in a dangerous situation. The deep transformations being made in their defense industries give insight into this process.

Ethics and consent statement

Ethics and Consent were not required.

Data availability statement

All data underlying the results are available as part of the article and no additional source data are required.