# MAVERICK OR FRONT-RUNNER? ARMY MODERNISATION IN HUNGARY IN THE LIGHT OF THE OTHER VISEGRAD COUNTRIES

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**Abstract**:
This article compares Hungary's defence modernisation policy with that of the other Visegrad countries and finds that Poland has invested the most in developing its military capabilities and, together with the Czech Republic, has benefited considerably from rising international demand stimulated by the war. Both combined the purchase of modern equipment with the award of government contracts to local suppliers. Slovakia followed the same pattern, but without significant export capacity. Hungary, on the other hand, was unable to prevent the collapse of its former defence industry. As a result, its current development programme uniquely integrates the goals of army modernisation with the plan for rebuilding the sector, which relies heavily on the participation of large European companies, whose role is less important in the other countries. Two other distinctive features of the Hungarian modernisation policy are its embeddedness in broader economic and regional policies, and the creation of six distinct territorial clusters where the reorganisation of the sector is taking place.

**Keywords:** Defence policy, modernisation, army development, military capabilities, Visegrad countries

***Titulo en Español:*** *¿Inconformista o pionero? La modernización del Ejército en Hungría comparándola con la de los demás países de Visegrado*

***Resumen***:

*Este artículo compara la política de modernización de la defensa de Hungría con la de los demás países de Visegrado y constata que Polonia es el país que más ha invertido en el desarrollo de sus capacidades militares y, junto con la República Checa, se ha beneficiado considerablemente del aumento de la demanda internacional estimulado por la guerra. Ambos combinaron la compra de equipos modernos con la adjudicación de contratos públicos a proveedores locales. Eslovaquia siguió el mismo patrón, pero sin una capacidad de exportación significativa. Hungría, por su parte, no pudo evitar el hundimiento de su antigua industria de defensa. Por ello, su actual programa de desarrollo integra de forma singular los objetivos de modernización del ejército con el plan de reconstrucción del sector, que se basa en gran medida en la participación de grandes empresas europeas, cuyo papel es menos importante en los demás países. Otros dos rasgos distintivos de la política húngara de modernización son su integración en políticas económicas y regionales más amplias, y la creación de seis agrupaciones territoriales distintas en las que se está llevando a cabo la reorganización del sector.*

***Palabras Clave:*** Política de defensa, modernización, desarrollo del ejército, capacidades militares, países de Visegrado



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## 1. Introduction: defence developments and the Russia-Ukraine war

On 24 February 2022 Russia launched a "special military operation" in the territory of Ukraine. The attack marked the beginning of a conventional war between the two countries in the immediate neighbourhood of NATO member states. The affected territories include the Western and Southern regions of Ukraine, which are partly inhabited by ethnic Poles, Hungarians, Slovaks, Romanians, Bulgarians and other minorities. As citizens of Ukraine, the male population of the minority communities are also subject to conscription, and when they fight for their country,[67] they too suffer losses. For example, Hungarians have been overrepresented in the Transcarpathian Brigade, which lost many soldiers in the past two years.[68]

However, it was not the Russia-Ukraine war that drove the governments of the region to reconsider their defence developments, nevertheless it certainly gave them a push to increase their military spending, speed up purchases, and reconsider their defence strategies. Measures had already been introduced in the early 2010s, but in the middle of the decade three international developments provided additional impetus to the modernisation of the defence sectors in the East Central European countries. First, the annexation of Crimea by Russia in 2014. Then the European migration crisis in 2015 posed a threat to European security. Third, the election of Donald Trump as US President and his dissatisfaction with the insufficient military spending of most European NATO allies[69] put strong political pressure on the corresponding member states of the military organisation.

Before the Russia-Ukraine conflict of 2014 the EU defence sector had only existed as a loose framework. Defence and military capabilities in the EU countries had been developed on the national level. In the field of defence policy, the national decision-makers had mostly competed for technology and/or markets, although there had been some important collaborative projects at multilateral level, such as Puma and Eurocopter, Tornado jet, Eurofighter and Airbus A400M. In 2004 the European Defence Agency was established, and in 2016, after the Russian takeover of Crimea, the EU started to introduce incentives for a more systemic cooperation, which led to the creation of the European Defence Technological and Industrial Base (EDTIB), the Coordinated Annual Review on Defence (CARD), the Permanent Structured Co-operation (PESCO), and the European Defence Fund (EDF) – a fund that supports the joint procurement of military equipment. Moreover, a new European Commission Directorate-General (DG), the DG for Defence Industry and Space (DEFIS) was set up to manage the defence policy and the space programme of the European Union.[70]

The Russia-Ukraine war intensified the desire for more effective joint defence industrial capabilities and procurement. To this end, in 2023, the European defence industry through common procurement (EDIRPA) and the Act in Support of Ammunition Production (ASAP) were adopted as two complementary instruments on the supply and demand sides,

[67] "Almost 400 ethnic Hungarians serve in the Defence Forces of Ukraine", We are Ukraine, 10 July 2023, at https://www.weareukraine.info/almost-400-ethnic-hungarians-serve-in-the-defense-forces-of-ukraine/

[68] One of the heaviest damages occurred when the 128th Mountain Assault Brigade from Munkachevo was hit by a Russian missile, see Brovko, Liza: "The tragedy with the 128th brigade: the Russian occupiers could have determined the location of the line-up due to a broken device", Babel, 4 April 2024, at https://babel.ua/en/news/105680-the-tragedy-with-the-128th-brigade-the-russian-occupiers-could-have-determined-the-location-of-the-line-up-due-to-a-broken-device

[69] That is their failure to reach the expected minimum of 2% of their GDP in their defence spending. Feliu, Justine (2016): "Trump, NATO and European defence spending", Bruegel publications, 15 November 2016, at https://www.bruegel.org/blog-post/trump-nato-and-european-defence-spending

[70] Chovančík, Martin; Krpec, Oldřich: "Cloaked disintegration – Ukraine war and European defence-industrial co-operation in Central and Eastern Europe", *Defense & Security Analysis*, Vol. 39, nº 3 (2023), pp. 369–386 at https://www.tandfonline.com/doi/epdf/10.1080/14751798.2023.2204596?needAccess=true

respectively.[71] The former incentivises the EU member states to jointly (with the participation of at least three countries) procure critical defence products and capabilities, while the latter supports the boosting of ammunition and missile production in the EU. The ammunition production programme allocated EUR 500 million for the supply of explosives, missiles, powder, shells, and testing and reconditioning certificates. Under the auspices of EDIRPA, the European Commission proposed that at least 35% of the defence procurement expenditure should be spent with EU manufacturers through collaborative programmes. It also encouraged joint procurement of ammunition to ensure that munitions were readily available in sufficient quantities to assist member states under attack. Moreover, the Commission called for the withdrawal and replacement of Soviet-type military equipment to meet the need for interoperability (especially in regard to heavy land-based military equipment) as well as for the development and modernisation of medium-range ground to air defence tools (to protect critical infrastructure vital for warfare, production and social order).[72]

This latter was a specific and particularly challenging objective for the formerly communist NATO members, which inherited Soviet and/or Soviet-type military equipment from the era of the Warsaw Pact. Among them, three of the four Visegrad countries (V4), Czechia, Hungary and Poland joined NATO in 1999, while the fourth member of the regional cooperation, Slovakia became part of the defence alliance in 2002 (and all four obtained memberships in the EU in 2004). The prevailing military industries in those countries were specialised in mass-production of easily reproducible Cold War weapons and Soviet technologies. Behind the Iron Curtain, the performance of the Czechoslovakian defence industry was outstanding.[73] Poland also had significant manufacturing capacities, while Hungary was mostly known for small arms production and repair capabilities. After the collapse of the communist regimes, state subsidies were phased out, and under market conditions most traditional products proved to be non-competitive and unprofitable. Poland, Czechia and, to some extent, Slovakia maintained downsized defence capabilities to meet the needs of their national armed forces. In Hungary, in contrast, the defence industry disintegrated and for two decades only minor repair and maintenance capabilities were sustained. On the road to NATO membership, the replacement of the aging former Soviet equipment and technologies had already begun in the 1990s and speeded up after the turn of the century. However, resources allocated for the modernisation of the defence sector remained insufficient, falling far behind the actual needs. Moreover, in times of economic hardship army development tends to get overshadowed by social and financial considerations as it was the case, for example, during the transformation recession, in the early 1990s or the international financial crisis of 2008-09. While some units, including the ones deployed abroad in international – mostly UN and NATO – missions were well-equipped and well-trained, the general state of the armies in the Visegrad countries, particularly in terms of military strength, generated legitimate criticism. Although pressing external factors in the mid-2010s generated a change in the attitude of the governments, and strengthened their commitment to army modernisation, that only signalled the beginning of the road, and after the break-out of the Russia-Ukraine war the European Commission had a good reason to urge the detachment of the V4 armies from the Soviet technologies and equipment. The war in Ukraine urged the European NATO members to

[71] See the EC glances at https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3554 and https://defence-industry-space.ec.europa.eu/eu-defence-industry/asap-boosting-defence-production_en, respectively.

[72] See the Joint Communication of the European Commission on the Defence Investment Gaps Analysis and Way Forward at https://commission.europa.eu/document/download/4bcf9a69-ed82-4a74-836f-b85bb16725f6_en?filename=join_2022_24_2_en_act_part1_v3.pdf.

[73] Albeit it showed considerable territorial differences as the bulk of advanced technologies and products came from the Czech territories.

expand their defence industry capacities and increase military production to provide sufficient quantities of materials and weapons for a conventional war. They also realised the importance of developing and producing new technologies, such as drone-based reconnaissance and "drone artillery" systems, to adapt to electronic warfare to respond to the threat of combat drones. Special attention has also been paid to cyber defence and cyber warfare. Experience from the war in Ukraine shows that the warring parties do not attack civilian telecommunications and data networks, as data obtained from such networks serve as an important source of information. Therefore, the objective is not to shut down the civilian communication systems of the other side, but to hack, and continuously monitor them with the purpose of phishing. Nevertheless, the destruction of military communications, cryptography and data transmission systems remains a top priority. Tracking down and neutralizing command and control centres of significant military electronic assets is now a basic requirement in a war situation, which represents a new level of electronic warfare. The Visegrad countries pursue similar capability development in electronic warfare and cyber defence, but information publicly available in this area remains very limited.

## 2. The Zrínyi modernisation plan of Hungary

After the turn of the century Hungary's defence expenditure reached bottom low in 2014-15.[74] The HADIK plan[75] was launched in 2012 with the aims of reviving the defence industry, expanding the domestic production, repair and maintenance capabilities, developing and producing a variety of handguns and light-armoured vehicles. However, the lack of sufficient financial resources prevented any major progress in the implementation of the plan,[76] thus the resignation of the minister in 2015 and the appointment of a new leader to the Ministry of Defence was followed by the presentation of a new development plan, called Zrínyi 2026.[77] The plan was built upon a continuously expanding defence budget,[78] and it translated into the procurement of military vehicles, other weapons and technologies. The opposition criticised the plan for two reasons: one was the lack of transparency (its components have never been made public, nor accessible to the relevant parliamentary committees), the other was the rationale behind the purchase of traditional, heavily armoured vehicles and other expensive equipment and technologies.[79] The government, in contrast, presented the programme as the most

[74] See "Hungary Military Spending/Defense Budget 1960-2024", Macrotrends, at https://www.macrotrends.net/global-metrics/countries/HUN/hungary/military-spending-defense-budget

[75] Kovács, Géza Péter (2023): "HADIK-terv: cél a hadiipar fellendítése", Védelmi Ipar Blog, 4 January 2023, at https://vedelmiiparblog.hu/blog/hadik-terv-a-hadiipar-fellenditese/

[76] Simicskó, István: "Response to the K/6169. written question entitled `On the implementation of the HADIK Plan´", National Assembly, September 2015, at https://www.parlament.hu/irom40/06169/06169-0001.pdf

[77] The legal foundation of the plan was issued in Government decree nº 1298/2017 (02.06.). The plan has two major components. See Budavári, Krisztina (2019): "A Zrínyi 2026 program. Korlátozott lehetőségek a magyar védelmi ipar fejlesztésére", *Hadtudomány*, Vol. 29. nº 3 (2019), pp. 142-159. In this article we do not deal with the first one, which incorporates the HR-related objectives and measures (outlined in Benkő, Tibor: "A sikeres haderőfejlesztés záloga (1.)", *Honvédségi Szemle*, Vol. 151, nº 1(2023), pp- 3-15). Our focus here rather lies with second dimension, which is the modernisation of the defence industry and technologies.

[78] The plan envisaged an annual 0.1 percentage point increase in the defence budget until it reaches the required level of 2% (compared to GDP). The total expenditures were planned to reach HUF 3500 (almost EUR 9) billion. (See "Zrínyi 2026. Defence and Army Development Program" at https://web.archive.org/web/20180306144605/https://honvedelem.hu/files/files/108409/zrinyi2026_190_190_7.pdf , p. 7), to be spent in line with NATO recommendations (i.e. 30% for pesonnel, 40% for materials, and another 30% for development, see Budavári *op. cit*. p. 144).

[79] See Benkő *op. cit.* p. 3 and Minutes of the Committee of Defence and Policing: session on 9 January 2019, at https://www.parlament.hu/documents/static/biz41/bizjkv41/HOB/1901091.pdf p. 17, session on 14 October 2021, at https://www.parlament.hu/documents/static/biz41/bizjkv41/HOB/2110141.pdf p. 14, as well as Gallai, Sándor; Gyuriss, Daniel: "Defence policy in the shadow of the Russia – Ukraine war," in Gallai, Sándor (ed.) (2023) *The most difficult year? Hungarian Politics 2022,* Budapest, MCC, pp. 309-338, p. 311

comprehensive defence development plan in the history of post-communist Hungary. We first outline the most important measures and policies of the modernisation programme, then compare to those of the other Visegrad states to see whether the Hungarian actions fit into a general regional pattern or they stand alone in their nature or timing. In other words, we wish to answer if Hungary with its programme is a maverick and/or a frontrunner in the region.

Hungary's approach to the revival of its defence sector was elaborated in the Defence Industrial Strategy of 2021.[80] The document was classified, but information on corresponding investments and procurements reveals the directions and objectives of defence developments. The revitalised defence industry seems to be organised into six clusters of different profile and geographic location. Small arms production is concentrated in Bács-Kiskun and Csongrád-Csanád counties, aerospace-related defence companies operate in Békés, combat and automotive vehicles are manufactured in Zala and Somogy counties, ammunition and explosives are found in Veszprém county, locator production can be found in Szabolcs-Szatmár-Bereg county, while the centre of radio and satellite communication system production is in the capital city of Budapest.[81] In the absence of strong domestic capabilities, the revival of the Hungarian defence industry has been based on close cooperation with large, internationally significant and competitive companies such as Rheinmetall, Airbus, Saab and Dynamit Nobel Defence.[82]

In some areas, the government simply purchased internationally competitive products, while in other cases, it combined the procurements with technology and/or imports as well as with cooperation in development. One of the first and largest deals (worth of EUR 565 million)[83] was signed with the German Krauss-Maffeis Wegmann holding. It included a lease contract of 12 Leopard 2A4 (for training) and the purchase of 44 Leopard 2A7 tanks, 3 Leguan 2 assault bridges, 5 WiSENT 2 armoured recovery vehicles, and 24 PzH (Panzerhaubitze) 2000 self-propelled howitzers.[84]

The German Rheinmetall AG began the test production of Lynx KF41 infantry fighting vehicles in 2023 in Zalaegerszeg. As a start, that factory will produce 172 Lynx for the Hungarian army, 45-50 vehicles per year. On top of those, the government ordered and received 38 Lynx from Germany, and 9 Büffel armoured recovery vehicles.[85] Thus, the government not simply purchased equipment, but successfully convinced the producing company to build a factory in and deploy assembly chains to Hungary. A similar deal not only combined procurement with the import of production, but also incorporated knowledge transfer and development. It was and agreement with the Turkish Nurol Makina company, which developed and produces the 4x4 armoured wheeled combat vehicles, named Ejder Yalcin and NMS Yörük (in the Hungarian defence system the former is listed as Gidrán, the latter as Nomád). The army is expected to get more than 300 vehicles of different configuration primarily for reconnaissance tasks in border protection and foreign missions.[86] The first vehicles were

[80] Taksás, Balázs (2020): "A hadiipar fejlesztésének feltételei és működésének követelményei", *Honvédségi Szemle*, nº 2 (2020), pp. 125–135.
[81] Kovács, Dániel : "Feltámadt a hadiipar", Demokrata, 8 November 2021, at https://demokrata.hu/magyarorszag/feltamadt-a-hadiipar-445113
[82] Taksás, Balázs; Hegedűs, Ernő: "A magyar védelmi ipar jövőképe", *Köz-Gazdaság,* nº 1 (2022), pp. 9–26. at http://retp.eu/index.php/retp/article/view/1405
[83] Heiming, Gerhard: "Hungary Becomes Third WiSENT 2 User in NATO", European Security & Defence, 6 February 2020, at https://euro-sd.com/2020/02/news/15916/hungary-becomes-third-wisent-2-user-in-nato/
[84] See the press release at https://honvedelem.hu/hirek/hazai-hirek/uj-harckocsikat-vesz-a-honvedseg.html
[85] "Milestone for the Lynx", Rheinmetall, Press release, 12 January 2023 at https://www.rheinmetall.com/en/media/news-watch/news/2023/jan-mar/2023-01-12_milestone-for-the-lynx
[86] Huszák, Dániel: "Célegyenesben az újabb honvédségi páncélos-beszerzés", Portfolio, 10 October 2021, at https://www.portfolio.hu/global/20211010/celegyenesben-az-ujabb-honvedsegi-pancelosbeszerzes-504382

delivered from Turkey, but the rest will be assembled in Kaposvár and Győr, Hungary. The two plants will have a joint capacity of ca. 100 vehicles per year. The Hungarian factories will also manufacture the upgraded versions and an 8x8 armoured wheeled combat vehicle (not yet officially named), which are jointly developed by Nurol Makina, Hungary's national N7 Holding and the Hungarian sister company of the German Rheinmetall.[87]

Rheinmetall Hungary founded a separate company (Munitions Zrt.) for the production of large-calibre NATO-standard ammunition (from 30 mm machine gun ammunition to 155 mm artillery shells). The plant was established in Várpalota, and is expected to employ more than 200 people.[88] That ammunition complex will also host a Hirtenberger ammunition and explosives factory. The Austrian company, which has subsidiaries in the UK and New Zealand, was taken over by the Hungarian state. The globally competitive company has been specialised in the production of 120-, 81-, and 60-mm mortars and grenades. The Austrian manufacturing capacity is expected to be re-located to Hungary.[89]

In 2018 the Hungarian government purchased 12 of the MRZR 4 ultra-light tactical all-terrain vehicles, produced by the American Polaris Industries; six years later the Hungarian army also received from the government 8 PZR XP4 1000 off-road vehicles and 8 6x6 570 quads.[90]

Based on an agreement signed between the Hungarian Government and the Swedish Defence Materiel Administration in 2001, the Hungarian Air Force received 14 JAS-39C/D Gripen fighter jets to replace the old, Soviet-made MiG combat aircraft. In 2024 the contract with Sweden was modified to provide Hungary with four additional aircraft and upgrades as well as to extend support for the fighters until 2036.[91] Hungary also decided to purchase the MS20 Block 2 capability upgrade package for the Gripen aircraft in service, which includes communication and radar system upgrades as well as more powerful weapons.[92]

The French Airbus SE (70%) and the Hungarian state (30%) founded a joint venture (Airbus Helicopters Hungary Kft.), and set up a manufacturing plant for EUR 90 million in Gyula to produce helicopter parts with 250 employees.[93] The factory produces high-precision components for the dynamic systems and kite structure of (both civil and) military helicopters, including the H145M and H225M rotary-wing aircraft used by the Hungarian defence forces.[94] In 2018 Hungary ordered twenty H145M multirole helicopters from the Airbus factory in Germany, followed by the order of sixteen H225M helicopters from a French factory of the

[87] Ocskay, István; Vágner, Szabolcs: "Gidrán – egy növelt aknavédelemmel rendelkező harcjármű megjelenése a Magyar Honvédségben II. Rész", *Haditechnika*, Vol. 55, nº 4 (2021), pp. 47-54, at http://real.mtak.hu/128647/1/HT_2021-4_cikk_09.pdf

[88] See Rheinmetall Hungary Munitions Zrt, 2024, at https://rheinmetalldefence.com/en/rheinmetall_defence/company/divisions_and_subsidiaries/rheinmetall_hungary_munitions/index.php

[89] Hecker, Flórián: "Magyarországot választhatja a NATO", Világgazdaság, 26 January 2022, at https://www.vg.hu/vilaggazdasag-magyar-gazdasag/2022/01/magyarorszagot-valaszthatja-a-nato

[90] Sin Bettina: "Újabb polarisok a magyar honvédség szolgálatában", Honvédelem, 19 February 2024, at https://honvedelem.hu/hirek/ujabb-polarisok-a-magyar-honvedseg-szolgalataban.html

[91] See the press release "Saab receives gripen order for Hungary", Saab, 23 February 2024, at https://www.saab.com/newsroom/press-releases/2024/saab-receives-gripen-order-for-hungary

[92] Huszák, Dániel: "Új Gripeneket vásárolhat Magyarország, de még az is lehet, hogy annál valami sokkal jobb jön", Portfolio, 23 January 2022, at https://www.portfolio.hu/global/20220123/uj-gripeneketvasarolhat-magyarorszag-de-meg-az-is-lehet-hogy-annal-valami-sokkal-jobbjon-521673

[93] "Kiemelt ágazatként tekint a kormány a védelmi iparra", Magyarország Kormánya, at https://kormany.hu/hirek/kiemelt-agazatkent-tekint-a-kormany-a-vedelmi-iparra

[94] "Leszállt az Airbus Gyulán, átadták a helikoptergyárat", Beol, 28 July 2022, at https://www.beol.hu/helyi-gazdasag/2022/07/leszallt-az-airbus-gyulan-atadtak-a-helikoptergyarat

company.[95] The new SAMOC Air Defence Missile Operations Centre,[96] the new command and control system for the Hungarian air defence, was also developed and manufactured by Airbus of Germany.

For transport purposes, Hungary first bought two Airbus A319,[97] then also purchased two Embraer KC 390 military aircraft. The later – among other things – provide aerial refuelling capability (a capability missing from most other air forces in the region).[98] In addition, the government could take over the Czech AERO Vodochody, a manufacturer of training and light combat aircraft, which was first acquired – from state-loan – by the HSC Aerojet Zrt., owned by Kristóf Szalay-Bobrovniczky, then, following his appointment as minister of defence, it was bought by Zsolt Hernádi, chairman and CEO of MOL, Hungary's oil and gas company, who sold it to the state.[99] The government ordered 12 L-39NG jet trainer and reconnaissance aircraft from the factory, worth of ca. HUF 60-70 billion.[100]

The Hungarian government in 2020 reached an agreement with its Israeli counterpart on Hungary's purchase of the Iron Dome system and the production of some of its units at the Nyírtelek plant from 2023 onwards. The 11 ELM-2084 air surveillance, air defence and artillery reconnaissance radars will replace the old Soviet locator system. The integration of the new air defence system will be carried out by Rheinmetall's Canadian subsidiary.[101]

The air defence missile systems are of partly Norwegian, partly American origin. The surface-to-air missile launching system, marketed under the name NASAMS,[102] is a product manufactured by the Norwegian Kongsberg Defence & Aerospace company in cooperation with the Raytheon of the USA. The approval of the purchase of 180 AIM-120C-7 missiles and an additional package of 60 of the same or C-8 (AMRAAM-ER) missiles came from then president Donald Trump presumably agreed upon during the Hungarian prime minister's visit to Washington.[103]

The Hungarian Ministry of Defence signed a contract with Dynamit Nobel Defence, a German-Israeli company, which will manufacture reactive armour and armour piercing equipment in Kiskunfélegyháza.[104] The company will produce one of the main components, the launcher barrel of the recently developed RGW-110, manually launched, guided anti-tank missiles, which will also be supplied to the Hungarian army.[105] Additional guided anti-tank

[95] Baranyai, Gábor: "Hadrendbe állnak a H145M helikopterek", Magyar Nemzet, 1 February 2022, at https://magyarnemzet.hu/belfold/2022/02/hadrendbe-allnak-a-h145m-helikopterek

[96] Tömböl, László; Böcz, Lajos Lóránt; Juhancsik, János: "A földi telepítésű légvédelem új vezetési rendszere", *Haditechnika*, nº 3 (2021), pp. 64–69, at http://real.mtak.hu/127255/1/HT_2021-3_cikk_11.pdf

[97] Darabos Erika: "Bemutatták a Magyar Honvédség Airbus A319-es repülőgépeit", Jetfly, 2 February 2018, at https://www.jetfly.hu/mh-59.-kecskemet/bemutattak-a-magyar-honvedseg-airbus-a319-es-repulogepeit

[98] "MHP Haderőtervezési Csoportfőnökség: A tervezetthez képest jobban halad az első magyar KC-390 katonai szállítórepülőgép gyártása", Honvedelem, 28 September 2022, at https://honvedelem.hu/hirek/a-tervezetthez-kepest-jobban-halad-az-elso-magyar-kc-390-katonai-szallitorepulogep-gyartasa.html

[99] Domokos, Erika: "A magyar állam megszerezte a cseh repülőgépgyáras céget és a Nemzeti Sportot", Economx, 1 October 2022, at https://www.napi.hu/magyar-vallalatok/kormany-allamositas-nemzeti-sport-cseh-repulogyar-vodochody-n7-holding.760729.html

[100] *Ibid.*

[101] Baranyai, Gábor (2022): "A Vaskupola szeme jövőre érkezik a honvédséghez", *Magyar Nemzet*, 21 November 2022, at https://magyarnemzet.hu/belfold/2022/11/a-vaskupola-szeme-jovore-erkezik-a-honvedseghez

[102] NASAMS = National/Norwegian Advanced Surface to Air Missile System.

[103] "Megérkezett Orbán Viktor a Fehér Házba", Hirado.hu, 13 May 2019 at https://hirado.hu/kulfold/kulpolitika/cikk/2019/05/13/megerkezett-orban-viktor-a-feher-hazba/

[104] "Defence industrial products made in Hungary increase security", Honvédelem, 12 December 2022, at https://defence.hu/news/defence-industrial-products-made-in-hungary-increase-security.html

[105] Geiger, Waldemar: "Ungarn wird erster RGW110 kunde", *Soldat-und-technik.de*, 12 December 2022, at https://soldat-und-technik.de/2022/12/bewaffnung/33502/ungarn-wird-erster-rgw110-kunde/

missiles will arrive from Israel's RAFAEL Advanced Defense Systems Ltd.. The Spike LR2 missiles will also be installed in the turrets of KF41 Lynx infantry fighting vehicles.[106]

The state-owned HM Arzenál Zrt. emerged in Hungary as the leading company in the production of small arms. Its factory, which started to operate in 2018, manufactures products that were licenced by the Česka zbrojovka Uherský Brod (now: Colt CZ Group) and the German Unique Alpine internationally renowned companies. In respect of manufacturing and assembly capacities, the plant in Kiskunfélegyháza is equipped with the best and latest available technology, and belongs to the top European factories.[107] It produces P-09 and P-07 pistols, Scorpion Evo3 A1 submachine guns, CZ-Bren2 carabines, and Unique Alpine sniper rifles.

Last, but not least, in a few areas, where a domestic player was already present and/or the entry barriers were lower, Hungarian companies could gain dominant positions. This was the case in information technology (e.g. cyber defence and space equipment), radio electronics and communication systems manufacturing, where the 4iG, a prominent Hungarian player of the field, signed a cooperation agreement with Rheinmetall. The German company increased its stake in the Hungarian company to 25.1% (through share purchase and capital increase), and established a joint venture with the 4iG. In the recently founded Rheinmetall 4iG Digital Services (R4) Kft. 51% is owned by the 4iG and 49% by Rheinmetall. The R4 Kft. provides IT services to the Hungarian and global subsidiaries of Rheinmetall and to other market customers.[108] The 4iG also has ambitions and stakes in the space industry, what is demonstrated by the acquisition of a stake in Israel's Space Communications (Spacecom) Ltd., the company, which develops and operates AMOS satellite systems through its subsidiary.[109] The 4iG acquired 9.5% of the Spacecom shares in 2022, and increased its stake to 20% in 2023 with the objective to purchase up to 31% over the next three years that would give the 4iG a majority stake in the company.[110] Spacecom provides broadcast and broadband services with AMOS 3 satellites for Hungary, but from 2024 onwards the country will again have its own orbital position and frequencies.[111]

In 2023 Hungary presented its unmanned aerial vehicle (UAV) called ProTAR, which was specially developed for military applications. The intelligent aircraft is a product developed by the Hungarian company Rotors & Cams Zrt. a subsidiary of the 4iG Group. The jet aircraft can make more efficient and less risky air defence exercises, including formation flying. The drone can be equally used for training purposes and as a target vehicle to identify hostile objects

[106] "Izraeli rakétákat vesz Magyarország", Neokohn, 14 July 2021, at https://neokohn.hu/2021/07/14/izraeli-raketakat-vesz-magyarorszag/

[107] "Hazai fegyvergyártás – beszélgetés a gyárigazgatóval", Kaliberinfo, 22 September 2021, at http://www.kaliberinfo.hu/cikkek/hazai-fegyvergyartas-beszelgetes-a-gyarigazgatoval/

[108] "A Rheinmetall és a 4iG közös vállalatot alapít Magyarországon", 4iG Group, 22 September 2021, at https://www.4ig.hu/a-rheinmetall-es-a-4ig-kozos-vallalatot-alapit-magyarorszagon

[109] In Hungaro DigiTel Kft, 4iG holds 75% and Antenna Hungária 25% of the shares.

[110] "A 4iG Nyrt. (4iG) megszerezte az izraeli Space Communications Ltd. (Spacecom) részvénycsomagjának 9,538 százalékát", Egov Hírlevél, 9 October 2022, at https://hirlevel.egov.hu/2022/10/09/a-4ig-nyrt-4ig-megszerezte-az-izraeli-space-communications-ltd-spacecom-reszvenycsomagjanak-9538-szazalekat/; "Megszerezte a 4iG a SpaceCom első részvénycsomagját", Portfolio, 7 October 2022, at https://www.portfolio.hu/uzlet/20221007/megszerezte-a-4ig-a-spacecom-elsoreszvenycsomagjat-571591; and "Megszerezte a Spacecom ötödét a 4iG", Világgazdaság, 24 February 2023, at https://www.vg.hu/penz-es-tokepiac/2023/02/megszerezte-a-spacecom-otodet-a-4ig

[111] CarpathiaSat is a joint venture between 4iG (51%), Antenna Hungária (44%) and New Space Industries Zrt. (5%). For more information see 4iG, in note 46.

and drive the anti-aircraft missiles on the target. The drone is also a useful tool for the simulation of a wide range of alert situations without the the need for larger aircrafts and pilots.[112]

By setting up joint ventures with prominent transnational and multinational companies, the Hungarian side gains direct access to the latest technologies, which is one of the possible ways of quicker catching up in the world market. Therefore, the Hungarian government – on top of combat equipment procurements – has been seeking and creating opportunities to provide favourable investment conditions for major international investors.[113] With their assistance, Hungary intends to achieve not only the modernisation of the army's defence equipment, but also the rebuilding of a national defence industry that would become self-sustaining and internationally competitive with exportable products. The existence of a political alliance and/or balanced relationship between the governments can facilitate such cooperation and guarantee that the procured military equipment would not be left without supply and/or repair capacity. Collaboration with the USA (under Trump), Turkey (Erdogan), Israel (under Netanyahu) and Brazil (under Bolsonaro) fit well into that framework. While economic and military ties with Germany have been traditionally strong, political relations got tainted due to considerable differences in the ideologies and values of the two governments. Nevertheless, Hungary became an important export market for German weapons and weapons systems:[114] in 2019 and 2020 – during Angela Merkel's chancellorship – Hungary purchased the largest volume of German military products for EUR 1.78 billion and EUR 838 million, respectively.[115] In 2021, Hungary spent "only" EUR 28 million on German military equipment, but its EUR 249 million spending in 2022 made the country the sixth largest buyer, despite the war and the increased military procurement by other states.[116] The use of German arms in the civil wars of the Middle East put the exporting defence companies in the crosshairs of the local press making Rheinmetall more available and open to the long-term cooperation offered by the Hungarian government. Although the outbreak of the Russia-Ukraine war and Germany's rearmament plans both secured the domestic position of Rheinmetall (and the other German defence companies) and increased the demand for their products, that did not affect the already established business relationships with Hungary.[117]

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[112] Hecker, Flórián: "Légvédelem: magyar cégek fejlesztettek sugárhajtású katonai drónt", Vilaggazdasag, 10 July 2023, at https://www.vg.hu/cegvilag/2023/07/legvedelem-magyar-cegek-fejlesztettek-sugarhajtasu-katonai-dront

[113] Nevertheless, the need for specialised personnel presents a serious challenge, as the industry will need at least 3,000 newly qualified professionals with military-related qualifications, 20% of whom with a degree in engineering (Taksás – Hegedűs *op. cit*. p. 17).

[114] "Germany is a major ally and strategic partner", Honvédelem, 29 June 2022, at https://defence.hu/news/germany-is-a-major-ally-and-strategic-partner.html?utm_source=honvedelem&utm_medium=RSS&utm_campaign=192.168.228.1

[115] "Report of the Federal Government on its Export Policy for Conventional Military Equipment in 2019", Federal Ministry of Economics and Energy, June 2020, at https://www.bmwk.de/Redaktion/DE/Downloads/P-R/ruestungsexportbericht-2019.pdf?__blob=publicationFile&v=18, p. 82; and "Report of the Federal Government on its Export Policy for Conventional Military Equipment in 2020", Federal Ministry of Economics and Energy, June 2021, at https://www.bmwk.de/Redaktion/DE/Publikationen/Aussenwirtschaft/ruestungsexporte-bmwi-070221.pdf?__blob=publicationFile&v=12, p. 97.

[116] "Report of the Federal Government on its Export Policy for Conventional Military Equipment in 2021", Federal Ministry of Economics and Energy, August 2022, at https://www.bmwk.de/Redaktion/DE/Publikationen/Aussenwirtschaft/ruestungsexportbericht-2021.pdf?__blob=publicationFile&v=6, p. 112; and "Factsheet: Armaments Export Licences", Federal Ministry of Economics and Energy, 2022, at https://www.bmwk.de/Redaktion/DE/Downloads/F/Faktenblaetter/factsheet-ruestungsexportgenehmigungen-2022.pdf?__blob=publicationFile&v=10, p. 2.

[117] "Speech by Viktor Orbán at the inauguration of Rheinmetall's new factory in Zalaegerszeg", 26 March 2022 at https://miniszterelnok.hu/orban-viktor-beszede-a-rheinmetall-uj-gyarepuletenek-atadasan/

The ideological differences can easily be revealed in French-Hungarian governmental relations, yet, the interests of the two states (and that of their leaders) converge on several points,[118] which offer the possibility of pragmatic cooperation, the field of defence included. The same stands for Sweden: military and economic relations are advanced, but the political picture is rather negative. Nevertheless, despite the conflicts over Hungary' rule of law problems, the detention of Sweden's membership in NATO was resolved by the extension of the contract JAS 39 Gripen contract and the purchase of Carl Gustaf M4 multifunctional support guns.[119] Of the Visegrad countries, the only notable contribution to Hungary's defence industry came from Czechia in the field of military small arms and aircraft production. However, the cooperation was originally established by private actors, so that inter-state defence industrial cooperation remained insignificant.

To sum up, in the 1990s and early 2000s Hungary had lost its capacity to produce armaments, which was regarded by the Orbán-governments of the 2010s as a strategic mistake. Therefore, the Zrínyi modernisation programme intends to rebuild the sector in cooperation with trans- and multinational companies of advanced technologies and international competitiveness. Within NATO Hungary could initially mostly contribute to the joint capabilities in peacekeeping role and joint air defence. However, the external challenges of the mid-2010s speeded up the modernisation of the army, including the replacement of the old military equipment of Soviet-origin by modern weapon systems that are compatible with and integrated into the systems of the other European NATO members. The incorporation of Hungarian defence actors into international product chains has created an opportunity to utilize arms investments for the development of the defence sector and the domestic economy. The participating international players can help Hungary overcome the technological gap and accelerate knowledge transfer through joint ventures and acquisitions.

## 3. Army modernisation in the other Visegrad countries

Poland represents a special case, since it turned away from the traditional European partners, such as France, Germany and the United Kingdom, and started to seek new suppliers in and approved new orders from South Korea and the United States.

This trend has been reinforced by the Development of the Armed Forces for 2021-2035 programme. Poland aimed at producing defence equipment and modifications under licence, building on the existing sectoral capacities, and securing both supply to its own army and European export markets for its partners. The latter is a key motivation particularly for South Korea, an Asian country with highly developed military technology products, which is therefore willing to transfer technologies, making the partnership particularly and mutually valuable. Poland produces self-propelled guns at the state-owned Huta Stalowa Wola SA., which were designed in cooperation with Korea. The chassis and the propulsion of the AHS Krab self-propelled tracked gun-howitzer are Korean, the gun turret and the gun licence are British. The Polish Armed Forces decided to increase their number to 120 by 2024, and ordered an additional 152 in December 2023.[120] In response to the Russia–Ukraine war, Poland ordered 1,000 (sic!)

[118] Ablonczy, Bálint (2021): "How Viktor Orbán became a friend of Emmanuel Macron", Válasz Online, 27 January 2021, at https://www.valaszonline.hu/2021/01/27/orban-viktor-emmanuel-macron-szovetseg-elemzes/

[119] "Elszólta magát a tábornagy: vadiúj tankgyilkos fegyvereket kapnak a magyar katonák", Portfolio, 7 January 2019, at https://www.portfolio.hu/gazdasag/elszolta-magat-a-tabornagy-vadiuj-tankgyilkos-fegyvereket-kapnak-a-magyar-katonak.309663.html

[120] "Polish Armed Forces have received self-propelled howitzers KRAB", 31 October 2019, HSW at https://www.hsw.pl/en/news/polish-armed-forces-have-received-self-propelled-howitzers-krab/. Of the KRABs, Poland has delivered 18 to Ukraine and has a contract for 56 more. See "Ukrainian MOD thanked Poland for KRAB Howitzers and Hinted on the Further Plans", Defense Express , 4 December 2023, at https://en.defence-ua.com/news/ukrainian_mod_thanked_poland_for_krab_howitzers_and_hinted_on_the_further_plans-8760.html

new K2/K2PL Black Panther tanks (with training, logistics and ammunition; to be delivered by 2030) and 460 K9A1 Thunder self-propelled guns from South Korea. Half of the tanks will be produced at the Wojskowe Zakłady Motoryzacyjna in Poznań, which is a good example of the technology transfer to the Polish defence industry.[121] The Korean–Polish cooperation also incorporates the order of 12 KAI FA-50 Block 10 light attack fighter aircraft and 36 Polish variants (FA-50PL Block 20) along with training, logistics and technical support services (in value of USD 3bn).[122]

The United States also cooperates with Poland, but in that partnership the technology transfer was so far limited to smaller weapons and equipment, such as radio electronics and artillery rockets. Nevertheless, selling own products to European markets was an important consideration of US suppliers too. Following the selection of the American Lockheed Martin as a supplier in 2006, the Polish Air Force purchased and deployed 48 F-16 fighter aircraft. In 2020 they ordered an additional 32 5th-generation F-35A fighter jets (for USD 4.6bn) to be delivered between 2024 and 2027.[123] In 2019 the Polish government also decided to purchase rocket artillery from the US, and it contracted for 18+2 HIMARS launchers (in value of USD 424 m) with a missile range of 486 missiles, and took an initiative to acquire the technology from Lockheed Martin,[124] needed for the production of rockets in Poland to make the country self-sufficient in future supply.[125] Moreover, the Polish government ordered 2 batteries of the US Patriot medium range air defence system, which will be ready for deployment by 2027.[126] Last, but not least, in 2022 the Polish government initiated its most expensive procurement contract with the US: the 250 American M1A2 Abrams SEPv3 tanks, the 26 M88A2 Hercules armoured recovery vehicles and the 17 M1074 joint assault bridges – with ammunition, logistics and training packages – cost a total of USD 4.75bn; they are to be delivered by late 2026.[127] In 2022, Poland donated more than 200 T-72 tanks to Ukraine together with other Soviet-type combat vehicles, artillery and significant ammunition stocks.[128] The donation was followed by a new agreement between Poland and the United States, which incorporates the supply of 116 M1A1SA/FEP Abrams tanks, 12 M88A2 Hercules recovery vehicles, 8 M1074 joint assault bridges, 6 M577 command post carriers, 26 SECM shelters, logistic support and ammunition

[121] Smisek, Martin (2024): "Central European armoured vehicle programmes", European Security & Defence, 24 June 2024, at https://euro-sd.com/2024/05/articles/38176/central-european-armoured-vehicle-programmes/

[122] "First batch of Polish FA-50GF delivered", Scramble, 31 December 2023, at https://www.scramble.nl/military-news/first-batch-of-polish-fa-50gf-delivered

[123] "First Polish Air Force F-35A takes shape", Scramble, 8 May 2024, at https://www.scramble.nl/military-news/first-polish-air-force-f-35a-takes-shape

[124] In the past 10 years Lockheed Martin invested USD 1.8 bn in Poland, and created 6,700 jobs. See press release "Poland Receives Delivery of First HIMARS", Lockheed Martin, 15 May 2023, at https://news.lockheedmartin.com/2023-05-15-Poland-Receives-Delivery-of-First-HIMARS

[125] Adamowski, Jaroslaw: "Poland to sign $414 million deal for rocket launchers", Janes, 11 February 2019, at https://www.defensenews.com/global/europe/2019/02/11/poland-to-sign-414-million-deal-for-rocket-launchers/

[126] On top of the batteries, the government also ordered 23 units of British CAMM (Common Anti-Air Modular Missile). See Adamowski, Jaroslaw: "Poland will get a new air-defense system after the summer", *Defence News*, 11 April 2022, at https://www.defensenews.com/global/europe/2022/04/14/poland-will-get-a-new-air-defense-system-after-the-summer/

[127] Adamowski, Jaroslaw: "Poland signs $4.75 billion Abrams tank deal as Russia's war speeds procurements", *Defence News*, 5 April 2022, at https://www.defensenews.com/global/europe/2022/04/05/poland-signs-475-billion-abrams-tank-deal-as-russias-war-speeds-procurements/

[128] Polskie Radio: "Polska przekazała Ukrainie ponad 200 czołgów. To niejedyne wsparcie", *Polskie Radio 24.pl*, 29 April 2022, at https://polskieradio24.pl/artykul/2948125,polska-przekazala-ukrainie-ponad-200-czolgow-to-niejedyne-wsparcie

in value of USD 1.4 bn (of which 200 m will be covered by the US Foreign Military Financing programme).[129]

This would allow Poland to improve and upgrade its defence capabilities, modernise and replace the Soviet-type equipment to fully meet NATO expectations and Western standards. Since Russia's attack on Ukraine, Poland has been expanding its military capabilities by high expenditures and the placement of considerable defence import orders, with rapid delivery and capability expansion being the key considerations. Increasing cooperation with key defence partners was also in line with NATO expectations and US interests. One of the main reasons why Poland can effectively modernise its army is the very strong influence of the state in the defence industry. The state is not simply present with procurements, but also has a significant share of ownership built on a holding, named Polska Grupa Zbrojeniowa (PGZ SA), which brings together more than 50 state-owned companies under the Ministry of National Defence.[130] The holding is responsible for the execution of major government-sponsored projects, the largest of which is the Borsuk, the introduction of a new amphibious infantry fighting vehicle (NBPWP), which will replace the Soviet-origin BWP-1 (BMP-1) vehicles with a mass purchase of 588 units to be produced from 2024 onwards.[131] The supplier, the Huta Stalowa Wola also produces the remote-controlled gun turret system, the ZSSW-30 for the vehicles, which is powered by MK44 Bushmaster 30 mm machine gun from the American Northrop Grumman Corporation,UKM-2000C 7.62 mm machine gun of the Zakłady Mechaniczne Tarnów and SPIKE anti-tank missile system from the Israeli RAFAEL company. Since 2022 the same gun turret has also been mounted on the Rosomak 8x8 armoured personnel carriers,[132] which were licensed by the Finnish Patria first to 2023, then extended to 2028, are manufactured in Poland by the Rosomak S.A..[133] Moreover, Poland is the largest operator of battle tanks in the region. Apart from the already mentioned K2 Black Panther and M1A2 Abrams tanks, the Polish army has Leopard 2A4, Leopard 2A5, Leopard 2PLs (Polish variant) and locally produced PT-91 tanks in service. The PT-91 Polish tanks are based on the Soviet T-72 model, but with significant innovations and modern fire control systems. They are manufactured in the ZM Bumar-Łabędy S.A. plant in cooperation with the PGZ consortium.[134] The Polish defence industry also contributes to the ground-based air defence, since the army can – on top of the American HIMARS – rely on locally manufactured systems. The government ordered SPZR Poprad very short range air defence (VSHORAD) self-propelled anti-aircraft missile system with 79 launchers, equipped with Grom and Piorun missiles, all produced by PIT-RADWAR S.A. The company has also started to develop a SHORAD (short range) air defence system. The government supports the project by USD 17 million.[135] In addition, the Polish small arms production has been constantly developed in order to reach the

[129] Smisek, Martin: "Central European armoured vehicle programmes", European Security & Defence, 24 April 2024, at https://euro-sd.com/2024/05/articles/38176/central-european-armoured-vehicle-programmes/

[130] See the holding's website at https://grupapgz.pl/spolki/.

[131] Palowski, Jakub (2022): "Polish Borsuk IVF Program To Move Foward Soon", Defense 24, 11 February 2022, at https://defence24.com/armed-forces/land-forces/polish-borsuk-ifv-programme-to-move-forward-soon

[132] "First shooting from the ZSSW-30 Remotely Controlled Tower Systems", HSW, 30 January 2024, at https://www.hsw.pl/en/news/first-shooting-from-the-zssw-30-remotely-controlled-tower-systems/

[133] Dmitruk, Tomasz : "Po epoce Rosomaka czas na Borsuka?", Dziennik Zbrojny, 23, March, 2020, at https://dziennikzbrojny.pl/artykuly/art,2,4,11298,armie-swiata,wojsko-polskie,po-epoce-rosomaka-czas-na-borsuka

[134] The Polish tanks are based on the Soviet T-72 models, but with significant innovations and modern fire control systems. They are produced at the ZM Bumar-Łabędy S.A. plant in cooperation with the PGZ consortium. The plant is also responsible for the modernisation and conversion of older German Leopard 2 tanks into Leopard 2PL. See Zielonka, Mateusz: "Jakie czołgi w 2022 roku otrzyma Wojsko Polskie", Defence 24, 12 January 2022, at https://defence24.pl/sily-zbrojne/jakie-czolgi-w-2022-roku-otrzyma-wojsko-polskie.

[135] Szopa, Maciej: "Poprady w 19. Lubelskiej Brygadzie Zmechanizowanej", Defence 24, 4 November 2020, at https://defence24.pl/sily-zbrojne/poprady-w-19-lubelskiej-brygadzie-zmechanizowanej

Western standards. The Fabryka Broni "Łucznik" – Radom is now producing a modern rifle with all components. The FB MSBS Grot can fire both 5.56 and 7.62 NATO ammunition. The company can supply enough carabines to meet the needs of the Polish army.[136]

The largest private company in Poland's defence sector is the WB Group, a company specialised mainly in radio electronics and other communications equipment, fire control systems and aeronautical products, such as reconnaissance, strike and kamikaze drones.[137] The WB Group was founded in 1997, and it has been recognised by the markets as a producer of equipment of outstanding European standards.[138]

To sum up, the presented examples demonstrate how Poland embarked on a major force build-up. The country took the Crimean conflict of 2014 between Russia and Ukraine seriously, and since then it has spent heavily on the modernisation of its armed forces and placed numerous orders with the country's own defence companies, many of which developed own products based on foreign licences.

The Czech Republic and Slovakia followed a similar path. Both retained downsized military capabilities, but continued to order from their own defence industries after the change of regime and the dissolution of the Warsaw Pact. State involvement prevailed, but privatisation and private newcomers resulted in a significant share of private ownership in their defence sectors. No doubt, the Czech Republic was much more successful in this regard, nevertheless, that was mostly the legacy of the uneven territorial location of the Czechoslovak defence enterprises as most of them operated concentrated in Czech areas. The Czech defence industry was capable to produce tanks and other combat vehicles, artillery equipment and conventional small arms in such a high quality and quantity that the sector was characterised by powerful export capacities. However, as a result of 40 years of communist rule, the defence sector of the newly independent Czech Republic relied heavily on the supply of Soviet-type equipment for spare parts, modernisation and servicing.

In independent Czechia a small private company, founded in 1995, has constantly grown, and by the 2010s emerged as the largest player of the Czech defence industry. The Czechoslovak Group (CSG) – called Excalibur Group before 2016 – has a portfolio of more than 100 companies and 30 production facilities.[139] The most significant, nucleus company of the group is the original family-run enterprise, the Excalibur Army, which is famous of modernising, refurbishing and manufacturing combat vehicles.[140] The CSG owns the general tractor and truck manufacturer Tatra Trucks as well as Tatra Defence Vehicle, a company that manufactures military vehicles including the Pandur II 8x8 and the TITUS armoured vehicles.[141] The group also incorporates the Spanish explosives and large calibre ammunition producer Fábrica de Municiones de Granada (FMG) and the Italian small calibre ammunition producer Fiocchi Munizioni.[142] The holding has manufacturing capacity in India, where Dako-CZ produces truck parts. The electronics business of CSG is also noteworthy as ELDIS

[136] Szopa, Maciej: "Dziesiątki tysięcy Grotów dla Wojska. A to dopiero początek", Defence 24, 2 January 2023, at https://defence24.pl/przemysl/dziesiatki-tysiecy-grotow-dla-wojska-a-to-dopiero-poczatek. Such rifles are also in use in the Ukrainien army as a result of both military assistance and sale, see "The Minister of Defense of Poland announced the sale of GROT assault rifles to Ukraine", Militarnyi, 16 March 2023, at https://mil.in.ua/en/news/the-minister-of-defense-of-poland-announced-the-sale-of-grot-assault-rifles-to-ukraine/

[137] See "PERAD 6010 Tactical MANET Radio", WB Group, at https://www.wbgroup.pl/en/produkt/perad-digital-personal-radio/ and https://www.wbgroup.pl/en/produkt/warmate-loitering-munnitions/

[138] See the website of the company at https://www.wbgroup.pl/en/.

[139] More information on the holding company can be found at https://czechoslovakgroup.com/en

[140] More information on the company can be found at https://czechoslovakgroup.com/en/companies/excalibur-army

[141] More information can be found at https://czechoslovakgroup.com/en/companies/tatra-defence-vehicle

[142] See more details at https://czechoslovakgroup.com/en/companies/fiocchi-munizioni

develops and manufactures active radars, locators, and flight control systems. The holding, now a major contributor to the European markets, gave a significant capability boost to the Czech defence industry. Since 2014 Czechia has passed considerable quantities of military equipment and materiel to Ukraine[143] in return for preferential purchase of Western military products. The CSG is one of the main beneficiaries of the European arms build-up: after the Russian attack on Ukraine, the holding continued to manufacture and modernise ex-Soviet products, and realised outstanding revenues and capacity gains. Compared to 2022, its revenues increased by 71% in 2023, and reached EUR 1.73 billion.[144] The net profit nearly doubled that year, and accounted for EUR 210 million.

Another important private holding is the Colt CZ Group, formerly called Česká zbrojovka Group, which has been a European leader in the production of small arms. In 2021 the holding acquired the American Colt Holding Company, the owner of the manufacturer of the world-famous Colt pistols, revolvers and rifles. The acquisition resulted in the merger of the two holdings, which – as of 2022 – operate under the name of Colt CZ Group SE.[145] By the takeover, the Czech handgun company has also obtained US manufacturing and sales capabilities, and entered successfully the world's largest civilian firearms market.

Of the Czech state-owned enterprises LOM Praha and VOP CZ are the largest with 850 employees each. They are key manufacturers: the former is primarily engaged in helicopter maintenance, while the latter in the modernisation of armoured vehicles (including battle tanks) and the production of armoured driver cabins.[146] In addition, there are two other important state-owned companies: the Military Technical Institute (Vojenský technický ústav, VTÚ) and the Military Research Institute (Vojenský výzkumný ústav, VVÚ).[147] The Technical Institute is specialised in development, innovation and testing in the areas of intelligence, communications, command and control systems, while the Research Institute has its focus on military electronics and reconnaissance, cryptography development, chemical, biological and nuclear protection, special materials and technologies.[148]

The former Czechoslovak defence industry was also known for its aircraft production. The jewels were the L-39 Albatross jet trainer and the L-159 ALCA light combat aircraft and advanced trainer, sold in significant numbers in the former communist countries and their allies. The manufacturer, the state-owned Aero Vodochody established strategic partnership with the American Boing in 1998. Their cooperation terminated in 2004. Three years later, the Aero company was privatised to Penta Investments, which in 2021 sold its share to HSC Aerojet Zrt., owned by businessman Kristóf Szalay-Bobrovniczky, a close affiliate of the Hungarian government. When he was appointed to minister of defence in the government in 2022, the

[143] Pivoňka, Michal: Czech modernised tanks and other systems are and will be helping Ukrine in its fight against Russia; CZ Defence, 6 December 2022, at https://www.czdefence.com/article/czech-modernised-tanks-and-other-systems-are-and-will-be-helping-ukraine-in-its-fight-against-russia

[144] See the corresponding press release of the holding at "CSG increased its revenue by two thirds in 2023, and its EBITDA more than doubled", CSG, 10 April 2024, at https://www.edrmagazine.eu/wp-content/uploads/2024/04/2023-Q4-Czechoslovak-Group.pdf

[145] See the announcement of the Prague Stock Exchange at https://www.pse.cz/en/news/ceska-zbrojovka-group-se-to-acquire-colt

[146] Smisek, Martin: "The Czech Defence Industry Today", European Security & Defence, 26 October 2021 at https://euro-sd.com/2021/10/articles/exclusive/24104/the-czech-defence-industry-today/

[147] *Ibid*.

[148] See the web of The Military Technical Institute at https://www.vtusp.cz/en/; and the web of The Military Research Institute at https://www.vvubrno.cz/en/

company was first taken over by Zsolt Hernádi, the chairman and CEO of MOL, the Hungarian oil and gas holding, then acquired by the Hungarian state.[149]

Czechia imports military products mainly from the United States, including 24 of the latest US 5th generation fighter aircraft Lockheed Martin F-35A Lightning II.[150] The former Soviet helicopters will be replaced with the UH-1Y and AH-1Z helicopters of Bell Textron, also from the USA. The ground forces, in contrast, are supplied from EU manufacturers. The new tanks, for example, are and will be acquired by the Czech government from Germany's Krauss-Maffei Wegmann (KMW) company.[151] 14 Leopard 2A4 tanks were already donated by Germany under the Ringtausch programme (i.e. in exchange for former Soviet-type armaments transferred to Ukraine), and 14 more will be purchased by Czechia. Although 32 modernised T-72M4 CZ tanks will also be delivered to the 73rd Tank Battalion, in order to build up the heavy brigade capability required by NATO by 2030, the Czech government intends to buy at least 77 more tanks and combat support vehicles, while it also expressed its interest in participating in the production and the servicing of tanks.[152]

Czechia has also ordered altogether 246 CV-90 vehicles, including infantry fighting (141), command (31), reconnaissance (18), artillery observation (12), engineer (13), recovery (15) and medical evacuation (16) vehicles from the BAE Systems Hägglunds of Sweden (for CZK 59.7 bn) to be delivered between 2026–2030.[153] The package includes mobile workshops, training support, spare parts and other accessories.

The 62 units of TITUS 6x6 infantry mobility vehicles of three different variants (20 of the fire support coordination, 36 of the communication and 6 of the command and staff variants), developed and manufactured by Nexter of France and Tatra Defence Vehicle, were and will be delivered to the army between 2023 and 2027. The integration of electronics is provided by RETIA of Czechia.[154]

A similar cooperation can be observed in the field of artillery, where Czechia contracted for CAESAR (self-propelled howitzer) guns, again from Nexter, but mounted on Czech-made Tatra chassis in local factories. The altogether 62 self-propelled guns, with their accessories and missiles, will arrive in Czechia between 2025–2029 (partly at a discount price for the Soviet DANA guns transferred to Ukraine).[155]

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[149] Herczeg, Márk: "A magyar államé lett a HSC Aerojet Zrt., ami az államtól hitelt kapott a cseh katonai repülőgépgyártó megvásárlásához", 444, 1 October 2022, at https://444.hu/2022/10/01/a-magyar-allame-lett-a-hsc-aerojet-zrt-ami-az-allamtol-hitelt-kapott-a-cseh-katonai-repulogepgyarto-megvasarlasahoz

[150] Nevertheless, the current squadron of 14 Swedish Gripen fighter aircraft will be modernised and remain in service until 2035. See Jahn, Oliver: "Czech Republic will be the only one in NATO to be able to fly both Gripen and F-35", CZ Defence, 18 February 2024, at https://www.czdefence.com/article/czech-republic-will-be-the-only-one-in-nato-to-be-able-to-fly-both-gripen-and-f-35

[151] Now KMW, together with France's Nexter, is part of the German–French KNDS holding, see at https://www.knds.de/en/about-us/history/.

[152] Kolařík, Tomáš: "The Czech Armed Forces may receive up to 122 Leopard 2 tanks in total", CZ Defence, 9 April 2024, at https://www.czdefence.com/article/the-czech-armed-forces-may-receive-up-to-122-leopard-2-tanks-in-total.

[153] Zilvar, Jan: "Another significant milestone in the CV90 programme for the Czech Armed Forces: soldiers saw a mock-up of the vehicle as it will be taken over by the Czech Armed Forces in 2026", CZ Defence, 2 March 2024, at https://www.czdefence.com/article/another-significant-milestone-in-the-cv90-programme-for-the-czech-armed-forces-soldiers-saw-a-mock-up-of-the-vehicle-as-it-will-be-taken-over-by-the-czech-armed-forces-in-2026.

[154] Smisek, Martin, *op. cit.*

[155] "Czech Army to receive 10 more CAESAR self-propelled howitzers", CZ Defence, Press release, 16 December.2022 at https://www.czdefence.com/article/czech-army-to-receive-10-more-caesar-self-propelled-howitzers.

The Czech Army has also ordered the modernisation and upgrading of its 127 Pandur II CZ 8x8 IFVs of the Steyr–Daimler–Puch Spezialfahrzeuge of Austria,[156] of which 110 were actually assembled by the VOP in Czechia.[157] The modifications will be carried out between 2027 and 2029, and embrace new remote turrets, more modern communication systems, increased ballistic protection, firepower and manoeuvre capability.[158]

The government intends to purchase universal armoured wheeled engineer vehicles as well. Under the UKP-ŽV programme, a feasibility study of 2021 concluded that the Australian Thales Bushmaster 4x4 protected patrol vehicle would be the most suitable. The army has requested up to 82 of such vehicles to be delivered between 2025 and 2031; however, the contract has not been finalised yet.[159]

Last, but not least, Israeli products and technologies are also present at a degree that makes the Middle Eastern country Czechia's 2nd most important supplier after the USA.[160] Czechia purchased 8 EL/M 2084 multi-mission radars (MMR) as the first step to replace its Soviet-type airspace defence system inherited from former Czechoslovakia. Israel also contributed to the modernisation of the Czech air defence missile system. However, the upgrading of the air defence system builds on the participation of Czech companies as well. For example, Retia produced some key components of the radar system, and Tatra delivered specially modified chassis for the missiles. While purchasing modern foreign products and technologies, the Czech government constantly feeds the local defence manufacturers with orders to include them among the top suppliers to the modernisation of its army. Moreover, as a result of their advanced technology as well as the significant production and service capacities, the largest companies of the Czech defence sector, both state-owned and private, are competitive enough to benefit from the increasing international demands.

Slovakia took an approach similar to that of Czechia, but on a smaller scale. It retained most of its maintenance and artillery equipment manufacturing capacity and ammunition production. During the cold war Soviet BMP-1 infantry vehicles, Soviet T-55 and T-72 tanks were produced by ZŤS-Martin in Martin, and tube artillery product were made by ZŤS-Špecial in Dubnica nad Váhom. The breakdown of the international markets in the 1980s and the chaotic situation after Velvet Revolution further hurt the Slovakian defence industry, which also suffered from the decreasing competitivity. [161] However, there were two marked exceptions: the first one was the Zuzana 2 self-propelled wheeled gun (produced by the state-owned Konštrukta Defence) while the other was the large calibre (155 mm) artillery ammunition (made by the ZVS Holding, which is half owned by the Slovak state and half by the Czech CSG).[162]

Slovakia has been lagging behind the Czech Republic in the modernisation of its defence forces, nevertheless, both membership in NATO and the Russia-Ukraine war have given a significant boost to the replacements of the former Soviet equipment. As a result, the state-owned companies were restructured,[163] while private companies also emerged to fill the gaps

[156] The website of the company is available at https://www.gdels.com/.
[157] See the corresponding press release of the Czech Ministry of Defence and Armed Forces at https://www.army.cz/scripts/detail.php?id=15806.
[158] Smisek, Martin, *op. cit.*
[159] *Ibid.*
[160] Kolařík, Tomáš: "Czech–Israeli defence cooperation is gaining importance", CZ Defence, 15 October 2023, https://www.czdefence.com/article/czech-israeli-defence-cooperation-is-gaining-importance.
[161] Ostatník, Viliam: "Adapt to Survive: Slovakia's Arms Industry Faces New Reality", CEPA, 9 January 2024, at https://cepa.org/article/adapt-to-survive-slovakias-arms-industry-faces-new-reality/
[162] *Ibid.*
[163] This meant not only reorganising the companies, but also increasing civil production. For example, ZŤS-Martin has been involved in container solutions, navigation systems and mobile air traffic control towers, while ZŤS-

of market niches in technology. Artillery ammunition was switched from Soviet to NATO standard (from 152 to 155 mm), and the main producer, the ZVS Holding underwent an EUR 50 million upgrade after the break-out of the war. The manufacturer of artillery training ammunition, the VOP Nováky company has also benefitted from the war: it quadrupled its revenues since 2022, and realised a profit of EUR 22 million.[164] In 2018 Konštrukta Defence undertook the obligation of delivering 24 Zuzana 2 self-propelled guns to Ukraine (worth more than USD 100 million). The factory, which has more than 200 workers (36% more than in 2022), can now produce 20 of such artillery units per year. Its year-on-year profit was 10-times higher in 2022 than the year before.[165]

Slovakia transferred a significant amount of Soviet-type military equipment and materiel to Ukraine, including 30 BVP infantry fighting vehicles, an S-300 anti-aircraft missile system with missiles, 2 KUB missile systems, 13 MIG-29 fighter aircraft, 4 MI-17 and 2- MA-2 helicopters. In return, the Slovakian government was given the opportunity to buy valuable Western equipment at discount prices. Like Czechia, Slovakia also purchased German Leopard 2A4 tanks (15 in number), and it is very probable that the two countries will pursue a joint procurement for more thanks to benefit from the discounted purchase option. Slovakia also ordered 152 CV-90 MkIV infantry fighting vehicles from the Swedish BAE Systems Hägglunds worth of USD 1.37 billion. Some 80 turrets for these combat vehicles will be assembled by the Slovak KOVAL SYSTEMS company under a contract signed in 2023. While the Czech vehicles are equipped with 30 mm space guns, the Slovakians will get the 35 mm version.[166]

Slovakia will acquire 160 US-made Oskosh JLTV, 4x4 multipurpose, all-terrain armoured vehicles as well (for USD 190 million). This procurement is part of the Foreign Military Financing assistance programme, and the vehicles are expected to be delivered in 2025.[167] The government also placed an order for different versions of Finnish Patria AMV XP 8x8 armoured transport combat vehicles (altogether 76 vehicles for EUR 417 million).[168] The Slovakian defence industry is greatly engaged in the assembly of the vehicles (in at least 40%) with the participation of Konštrukta-Defence, CSM Industry and EVPÚ Defence of Slovakia. The EVPÚ manufactures the Turra remote-controlled gun turrets and the 30 mm machine guns of the combat vehicles.[169]

In exchange for the MIG-29 fighter aircraft, Slovakia received compensation of USD 900 million, thus the Slovakian Air Force will enter 14 F-16 C/D Block 70 (Fighting Falcon)

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Special has been involved in wind turbines, forestry machinery, railway components and construction equipment. See History, VÝVOJ Martin, at https://www.vyvoj.sk/en/about-us/history.html and Historical Background, ZŤS-Special, at https://www.ztsspecial.sk/en/historical-background

[164] Nicholson, Tom: "Slovakia enables arms exports to Ukraine as Fico completes backflip", *Politico*, 16 January 2024 at https://www.politico.eu/article/in-post-election-reversal-slovakia-enables-weapons-exports-to-ukrainef-fico/

[165] Ostatník, Viliam, *op. cit.*

[166] See the corresponding press release, at "BAE Systems signs contract with Slovakia's KOVAL SYSTEMS for CV90 production, BAE Systems, 2 May 2023, https://www.baesystems.com/en/article/bae-systems-signs-contract-with-slovakias-koval-systems-for-cv90-production

[167] "Viacúčelové vozidlá JLTV 4x4 Oshkosh predstavujú novú kvalitu pre Ozbrojené sily SR", Ministerstvo Obrany (Ministry of Defence), Press realease, 12 July 2023, at https://www.mosr.sk/53067-sk/viacucelove-vozidla-jltv-4x4-oshkosh-predstavuju-novu-kvalitu-pre-ozbrojene-sily-sr/,

[168] "Vláda schválila 1,2 miliardy eur na nákup obrnených vozidiel", *Pravda,* 17 May 2017, at https://spravy.pravda.sk/domace/clanok/429771-vlada-schvalila-1-2-miliardy-eur-na-nakup-obrnenych-vozidiel/.

[169] Fiorenza Nicholas: "Slovakia receives first Patria AMV XP 8x8 armoured combat vehicle", Janes, 28 September 2023, at https://www.janes.com/defence-news/news-detail/slovakia-receives-first-patria-amv-xp-88-armoured-combat-vehicle.

multi-role combat aircraft into service, the discounted price of which were USD 2.91 billion.[170] The decision on the upgrading of the helicopter fleet favoured the American UH-60M Blackhawk medium transport helicopters (9 for USD 261 million), because it was supported by the Foreign Military Sales programme of the US Department of Defence.[171]

Slovakia also ordered and received 1,600 Belgian FN MINIMI light machine guns in NATO 5.56 mm calibre in value of EUR 1.7 million,[172] as well as 5,000 M4 machine guns manufactured by COLT Defense LLC for approximately USD 4 million.[173]

One can conclude that Slovakia followed the Czech pattern of defence modernisation, although on a smaller scale: it purchased both European and US-made weapons and vehicles, while created opportunities for the national companies to become suppliers to the contracted foreign producers. The European purchases were carried out under the framework of EU cooperation, whereas American equipment were bought at – military aid-like – discounts prices. The resemblance also includes the cooperation with Israel. In the field of air defence Slovakia, like Czechia, opted for the purchase of Israeli equipment. Slovakia first obtained and installed 17 multi-purpose 3D radars from Elta Systems, which is a subsidiary of the Israel Aerospace Industries (IAI). Then, from the mother company, Slovakia also ordered short- and medium-range Barak MX missile systems as the main pillar of its future, modernised air defence system. The Barak systems, which are compatible with the Elta radars, will make Slovakia become the first NATO-member relying on the IAI systems.[174]

## 4. Conclusions

Security challenges in the past decade put the European NATO members under considerable pressure to increase their defence spending, modernise their army, and improve their capabilities.

Hungary launched a modernisation program, the implementation of which not only aimed at the replacement of old Soviet-type weapons by new equipment, but also the rebuilding and the expansion of its defence sector. The government relies heavily on the collaboration of leading international – mostly European – companies that are capable to develop and produce competitive products. By inviting them to invest in Hungary, setting up joint ventures, establishing local factories as well as by acquisitions, the government could and did accelerate the transfer of modern defence technologies. The development of the sector fits into the general economic policy of the government with the purposes of job creation, export enhancement, and regional development.

Foreign licences played an important role in the Polish force build-up too. The government purchased modern equipment, while also placed numerous and costly orders with the domestic producers. In financial terms, the size of the Polish defence budget – both in

[170] Reim Garrett: "Slovakia to purchase 14 Lockheed Martin F-16s", Flight Global, 12 July 2018, at https://www.flightglobal.com/fixed-wing/slovakia-to-purchase-14-lockheed-martin-f-16s-/128785.article

[171] Kominek Jiri: "Slovak 'Hip' replacement settles on nine Black Hawks", IHS Jane's Defence, 30 April 2015, at https://web.archive.org/web/20150822093725/http://www.janes.com/article/51100/slovak-hip-replacement-settles-on-nine-black-hawks

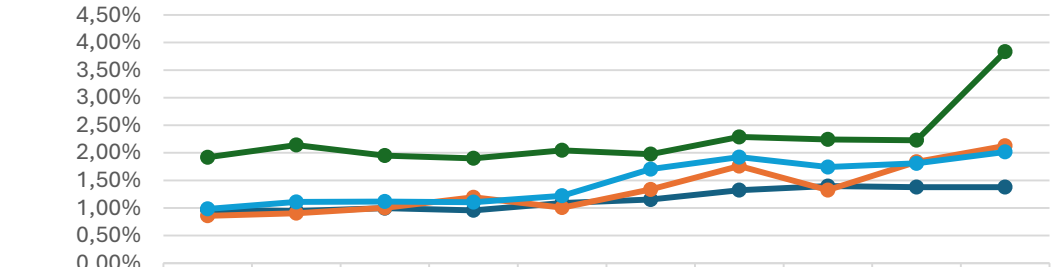
[172] "Slovenská armáda už má nové ľahké guľomety, v najbližších mesiacoch ich pridelia jednotkám", SITA, 14 November 2022, at https://sita.sk/slovenska-armada-uz-ma-nove-lahke-gulomety-v-najblizsich-mesiacoch-ich-pridelia-jednotkam/

[173] Miles: "Colt Capitalizes on Foreign Military Sales Program", Thefirearmblog, 27 April 2017, at https://www.thefirearmblog.com/blog/2017/04/27/colt-capitalizes-foreign-military-sales-program/

[174] Dóka, Otto: "Israeli Barak MX system succeeded in Slovakia", CZ Defence, 21 October 2023, at https://www.czdefence.com/article/israeli-barak-mx-system-succeeded-in-slovakia

absolute and relative terms (see Figures 1 and 2) – was by far larger than that the other Visegrad countries.

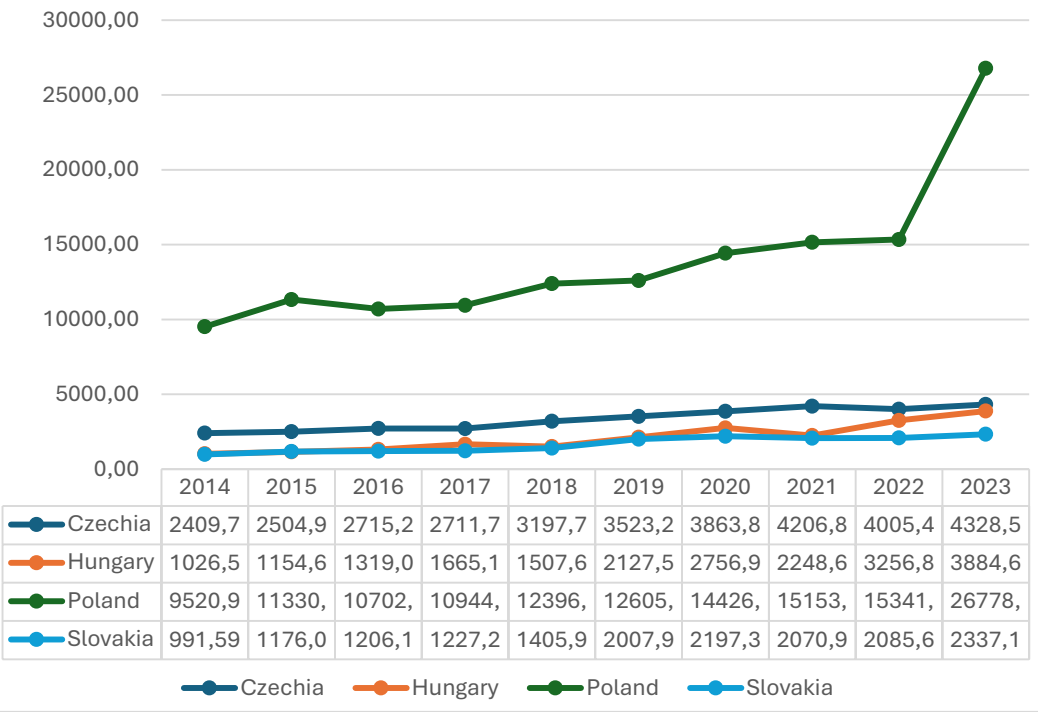
**Figure 1. V4 military expenditure as a percentage of GDP**




| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Czechia | 0,97% | 0,95% | 1,00% | 0,96% | 1,09% | 1,15% | 1,32% | 1,40% | 1,38% | 1,38% |
| Hungary | 0,86% | 0,90% | 1,00% | 1,19% | 1,01% | 1,34% | 1,76% | 1,32% | 1,84% | 2,13% |
| Poland | 1,92% | 2,14% | 1,95% | 1,90% | 2,04% | 1,98% | 2,29% | 2,24% | 2,23% | 3,83% |
| Slovakia | 0,98% | 1,11% | 1,12% | 1,10% | 1,22% | 1,70% | 1,92% | 1,74% | 1,81% | 2,02% |

Source of data: SIPRI, 2023[175]

**Figure 2. V4 military expenditure in USD millions**




| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| Czechia | 2409,7 | 2504,9 | 2715,2 | 2711,7 | 3197,7 | 3523,2 | 3863,8 | 4206,8 | 4005,4 | 4328,5 |
| Hungary | 1026,5 | 1154,6 | 1319,0 | 1665,1 | 1507,6 | 2127,5 | 2756,9 | 2248,6 | 3256,8 | 3884,6 |
| Poland | 9520,9 | 11330, | 10702, | 10944, | 12396, | 12605, | 14426, | 15153, | 15341, | 26778, |
| Slovakia | 991,59 | 1176,0 | 1206,1 | 1227,2 | 1405,9 | 2007,9 | 2197,3 | 2070,9 | 2085,6 | 2337,1 |

Source of data: SIPRI, 2023[176]

Hungary's spending on defence increased considerably in the past few years, but it was not before 2022 that it exceeded the expenditure of Czechia, which copied the Polish development model of purchasing modern foreign products and technologies, while persistently feeding the local defence manufacturers with orders. Moreover, both the leading Polish and the Czech

[175] "Military expenditure by region in constant US dollars", SIPRI 2023, at https://www.sipri.org/sites/default/files/SIPRI-Milex-data-1948-2023.xlsx

[176] *Ibid*

companies possess advanced technologies and significant production and service capacities to benefit from the increasing international demands. Slovakia, on the other hand, followed the same pattern on a smaller scale and with limited or no export capacities. It also procured foreign weapons and vehicles, and created opportunities for its national suppliers to become contracted partners of Western producers and Israel. The European purchases were mostly part of EU cooperation, whereas American equipment were bought at – military aid-like – discounts prices.

In contrast with the other Visegrad countries, and due to the lack of a significant domestic defence industry, Hungary had to seek close ties with and the imports of military equipment from European producers. The reconstruction of its military sector couldn't have been realized without the assistance of significant European defence enterprises. The uniqueness of Hungary's development lies neither on the expenditures, nor in the combination of foreign purchase with domestic production. Hungary is neither a maverick, nor a frontrunner, yet its modernisation programme has three distinctive features. First, the development programme combines the army modernisation goals with the rebuilding plans of the sector. Second, the transformation of the defence sector is embedded in broader economic and regional policies. Third, the revitalisation of the defence sector is organised around six distinct regional clusters marked by specialisation.

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