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The Bucharest Nine Part of NATO's Eastern Flank: an Analysis of Military Investment on Equipment

Bukurešťská devítka součástí východního křídla NATO: analýza vojenských investic do vybavení

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Abstract: An important part of NATO's deterrence and defence role is its military presence in the eastern part of the Alliance's territory, represented by the Bucharest Nine (B9). The ability of this group to fulfil its strategic mission depends on the condition of the military equipment at its disposal. The number of pieces of military equipment and their combat capability are determined by the investment in military equipment. In the context of the pledge to spend at least 20 % of total defence expenditure on military equipment, it appears that between 2004 and 2022 there is a steep increase of defence investment gap, followed by a partial absorption of the investment gap after 2014. The investment gap is reflected in the volume and condition of military equipment.

Abstrakt: Důležitou součástí odstrašujícího a obranného postavení NATO je jeho vojenská přítomnost ve východní části území Aliance, která je reprezentována uskupením Bukurešťské devítky (B9). Schopnost tohoto uskupení plnit svůj strategický úkol se odvíjí od stavu vojenského vybavení, které má toto uskupení k dispozici. Počet kusů vojenské techniky a její bojeschopnost je determinována investicemi do vojenského vybavení. V souvislosti se závazkem vydávat na vojenské vybavení alespoň 20 % z celkových vojenských výdajů se ukazuje, že mezi lety 2004 a 2022 dochází nejprve k prudkému navyšování obranné investiční mezery a následně po roce 2014 k jejímu částečnému umořování. Investiční mezera se projevuje v objemu a stavu vojenské techniky.

Keywords: Bucharest Nine; Defence Investment Gap; Military Investment Pledge; Military Equipment; Military Expenditure.

Klíčová slova: Bukurešťská devítka; mezera obranných investic; závazek obranných investic; vojenské vybavení; vojenské výdaje.

INTRODUCTION

An important part of NATO's deterrence and defence posture is its military presence in the eastern part of the Alliance's territory. Following the annexation of Crimea in 2014 and the invasion of Ukraine by Russian forces in 2022, the security environment in Europe has changed, and NATO has responded by reinforcing its forward presence, establishing multinational battle groups, and strengthening its presence at sea and in the air on NATO's eastern flank. The forward presence of allied forces is defensive and in line with international commitments and above all, the Alliance's commitments are a tangible reminder that an attack on one NATO Ally is an attack on all (NATO 2023a).

Thus, there are eight multinational battle groups on the eastern flank, integrated into the NATO command structure to ensure the necessary readiness and responsiveness, operating on a fully sustainable and rotational basis. The Battlegroups operate in concert with national indigenous defence forces and are always present in the host countries. NATO therefore classifies eight countries in the Eastern Wing that host multinational battle groups (NATO 2022), the same approach is taken by some authors e.g. Biziewski (2020). Another country that does not host a forward combat presence of NATO troops but could be included in the eastern flank is Finland from 2023. Some authors such as Bartoszewicz and Pavlíčková (2024), Stępniewski (2022) logically place Czechia in the eastern flank.

The eastern flank is related to the grouping we call the Bucharest Nine (B9), which includes Bulgaria, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia. It is a security formation of nine states on the eastern flank of NATO and their cooperation was launched in November 2015 in Bucharest at the initiative of Romania and Poland. All states are united by the fact that they were part of the Soviet bloc[1] (Erasymchuk 2021).

Most of the world's countries absorb significant amounts of resources from the defence sector that have alternative uses in other areas of the public sector. Military expenditure is known for each country, but there is no single indicator of the contribution of total defence output. Defence economists assume that the value of defence output is roughly equivalent to the expenditure spent on producing that output (Melese 2015). In an economic context, the focus is on military expenditures from the position and measurement of the input; on the other hand, in a strategic context, the focus is on the output (military capabilities, numbers of equipment and military personnel, etc.)(Wiberg 1983). Military expenditures are an approximate measure of military power, so the authors focus on both the input and output areas of military expenditures in this article. In the input domain, the focus is on a decomposition of military expenditure with an emphasis on the investment category and the associated defence investment gap In contrast, the output domain focuses on military capabilities, represented by the number of military equipment over the selected period.

1 Warsaw Pact

The issue of the B9's readiness has already been addressed by the global think-tank GLOBSEC in its study from 2023 (Lanoszka 2023), and in this paper we would like to focus on the state of the grouping's military equipment in the context of the resources it spends. In this context, it is also important to mention the "2&20 pledge", which has been taking shape since 2006 as a benchmark among NATO countries and was officially set at the Wales Summit in September 2014. In the context of capital expenditure, there is a key defence investment pledge, which stipulates spending at least 20% of expenditure on investment in military equipment (Mesterhazy 2018). For this reason, we will look at both the resources spent on military equipment and the change in the number and also the number of new defence acquisitions. The aim of this paper is to analyse the evolution of capital expenditure and the defence investment gap in equipment for the B9 countries and to show the change in the structure and numbers of equipment for selected categories.

1 METHODOLOGY AND DATA

The analysis of the defence investment gap is based on data from an open database published by the Stockholm International Peace Research Institute (SIPRI 1967) and annual reports NATO from 2004 to 2023 (NATO 2024). The SIPRI database provides data on the size of military expenditures. According to SIPRI, military expenditures exclude civil defence, veterans' benefits, weapons destruction and dismantlement of weapons production facilities, and demobilisation (SIPRI 2024).

The NATO annuals report obtains a decomposition of military expenditures into the main categories of personnel, military equipment (investment), infrastructure and other expenditures. In the context of investments, the period since 2004 will be considered, as all members of the B9 were already NATO members by then. A longer period of the evolution of investment in military equipment and the defence investment gap associated with this expenditure will show both the magnitude of the problem and the dynamics, where changes cannot be implemented in leaps and bounds but have a certain inertia.

Data on investment sizes serve as the primary source for analysing military investment expenditures over time. Although the defence investment pledge to allocate at least 20% of investment spending was established in 2014, we will adopt this as a universal benchmark for maintaining defence capabilities. Initially, we will examine the disparity between real investment spending and the stated defence investment pledge. A negative gap will indicate a shortfall in meeting this pledge, while a positive gap will indicate an excess. Subsequently, we will analyse the accumulated defence investment gap in military equipment. This gap will be calculated by summing the year-to-year differences between actual expenditure and the investment expenditure equal to 20% of total military expenditure for each country. Additionally, we will consider a scenario where each state not only allocates 20% of its military expenditure to investment but also ensures that total military expenditure constitutes 2% of GDP. We will then quantify the cumulative gap against a new benchmark, which involves spending 2% of GDP, with 20% dedicated

to investment. This methodology will help illustrate the extent of underfunding in the investment sector from 2004 to 2022.

The analysis of the quantity and condition of military equipment is based on information from the non-public database Military Balance+, which is published by the International Institute for Strategic Studies (IISS). The database contains information on the number of military equipment and their condition from 2008 until 2023, and it also collects information on upcoming and completed acquisitions. Information on the number of units in selected categories is used from this database. Changes in the number of selected categories will be interpreted in three periods, namely 2014, 2021 and 2023.

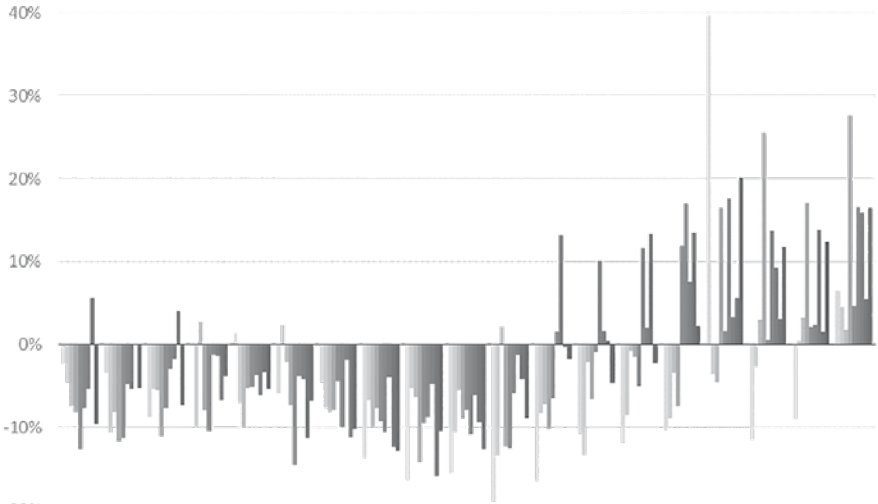
2 INVESTMENT IN MILITARY EQUIPMENT AND DEFENCE INVESTMENT GAP

NATO regularly reported the percentage structure of member states' expenditures, which are broken down into personnel, equipment, infrastructure, and other expenditures (NATO 2024). This structure doesn't say anything about the absolute size of the expenditure but about the distribution of available funds by purpose. The category of personnel expenditure absorbs a significant part of the available resources, where changes in personnel expenditure tend to have very little flexibility due to the mandatoriness of personnel expenditure and the rigidity of the labour market in this area. From the perspective of defence capability, manpower, together with adequate equipment, is identified as essential, as can be seen in some of the strategic documents on defence capability (Ministry of Defence of the Czech Republic 2015). Other categories of expenditure are more flexible and therefore also more exposed to changes in defence resourcing. The infrastructure spending category includes both national level spending and spending for NATO's common infrastructure (NATO 2023b). This category can include expenditure on facilities for members of the armed forces as well as expenditure on the technical infrastructure needed to provide defence. This includes both capital and operational expenditure.

Expenditure on equipment including investment in military equipment, is another important determinant of defence capability (NATO 2014). Based on the agreement, the 20% expenditure on military equipment can be considered a quasi-mandatory expenditure. The requirement for a mandatory share of investment spending in military equipment categories was a reaction against the loss of some alliance partners' military capabilities.

Defence investment gaps can be understood in several ways, often interpreted at the military level as shortfalls in strength or capability. In terms of capability development, defence investment gaps can be defined as the gap between a stated national priority and the level of investment effectively linked to that priority, in other words, deferred defence investment at the national level. Defence investment gaps can also be on a broader scale, within entire organisational structures such as NATO or the EU (European Commission 2022). For the purposes of this paper, we focus on the 20% defence investment threshold as declared by NATO in 2014.

The difference between the minimum spending share and the actual spending share on military equipment can show the size of the neglect of spending on weapon systems. Figure 1 shows the difference between the ratio of spending on military equipment and actual spending between 2004 and 2022. For the entire period under review, we consider the 20% ratio as the minimum, and the data in the chart and table show us the deviations from this requirement in each year for all B9 states. Before 2014, only rarely did states spend more than a 20% share of expenditure on military equipment. Surprisingly, even in the immediate period after the Defence investment pledge, the situation did not improve, with six out of nine states failing to spend the specified proportion of expenditure in 2015. However, the situation improved over time, with only Bulgaria, Czechia, Estonia and Hungary failing to meet the set pledge in 2018, and by 2019 only Czechia and Estonia. By 2022, all B9 states met the minimum spending requirement for military equipment.



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Bulgaria	-2%	-3%	-9%	0%	1%	-6%	-5%	-14%	-16%	-16%	-19%	-17%	-11%	-12%	-10%	40%	-12%	-9%	7%
Czechia	-5%	-11%	-5%	-10%	-7%	2%	-8%	-7%	-5%	-11%	-14%	-8%	-13%	-8%	-9%	-4%	-3%	0%	5%
Estonia	-7%	-8%	-6%	3%	-10%	-2%	-8%	-10%	-6%	-6%	2%	-7%	-2%	-1%	-3%	-5%	3%	3%	2%
Hungary	-8%	-12%	-11%	-8%	-5%	-7%	-8%	-8%	-14%	-9%	-12%	-10%	-7%	-1%	-7%	16%	26%	17%	28%
Latvia	-13%	-11%	-8%	-10%	-5%	-15%	-4%	-9%	-10%	-8%	-13%	-6%	-1%	-5%	12%	2%	1%	2%	5%
Lithuania	-8%	-5%	-3%	-1%	-4%	-4%	-10%	-11%	-9%	-11%	-6%	2%	10%	12%	17%	18%	14%	2%	17%
Poland	-5%	-5%	-2%	-1%	-6%	-4%	-2%	-4%	-5%	-6%	-1%	13%	2%	2%	8%	3%	9%	14%	16%
Romania	6%	0%	4%	-7%	-3%	-11%	-11%	-12%	-16%	-9%	-4%	0%	0%	13%	13%	6%	3%	2%	6%
Slovakia	-10%	-5%	-7%	-4%	-5%	-7%	-10%	-13%	-10%	-13%	-9%	-2%	-5%	-2%	2%	20%	12%	12%	17%

Figure 1: The difference between the minimum required share of military investment spending of 20 % and the real share of investment spending 2004-2022
Source: Own processing based on data from NATO. 2024. "*Defence expenditures and NATO's 2% guideline (2004-2023)*". 2024. https://www.nato.int/cps/en/natohq/topics_49198.htm

The resources that have not been invested can be understood as an internal gap affecting the security of the minimum required defence capabilities. We can illustrate the extent of disinvestment in military equipment by using the cumulative defence investment gap for the B9 countries. The cumulative gap for each country is shown in Figure 2. For each country, the cumulative gap was calculated by calculating the amount of investment made and the amount of investment that would make up 20% of the total defence expenditure. The result is a proportion of investment expenditure countries achieve compared to the set benchmark of 100%.

Initially, the only country that exceeded the investment-to-expenditure ratio was Romania. However, Romania fell below the set limit in 2008 and only caught up again with defence investment gap in 2020. Other countries began with gap, but a noticeable change occurred starting in 2014 when the cumulative gap began to decrease for most countries due to increasing investment spending in military equipment. By 2018, Lithuania was spending more than the minimum required amount, by 2019 Poland and Romania, and by 2022 Slovakia. The other states have so far failed to "pay off" their internal accumulated gap. The largest gap between the required amount and the realised amount is found in Czechia, which is at 71% of the necessary capital expenditure on military equipment.

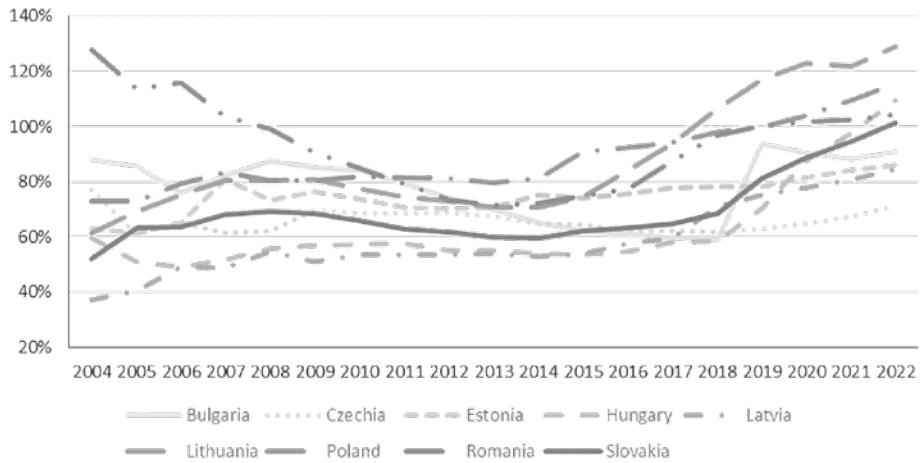


Figure 2: Cumulative gap of military investment expenditure in the case of spending 20 % of total expenditure for the period 2004-2022
Source: Own processing based on data from NATO. 2024. *"Defence expenditures and NATO's 2% guideline (2004-2023)*". 2024. https://www.nato.int/cps/en/natohq/topics_49198.htm

When we examine the defence investment gap through the lens of not only the requirement to spend at least 20% of military expenditures on military equipment but also the second requirement to spend at least 2% of GDP on defence, the military investment gap changes significantly. Figure 3 shows the cumulative gap of capital expenditures if each state were spending 2% of GDP on defence and allocating 20% of that spending to

investment in military equipment. The graph displays, in percentage terms, how much is being spent cumulatively compared to the requirement, based on a minimum level of spending and an optimal ratio of spending on military equipment.

Before 2014, only two countries, Bulgaria in 2004 and Romania from 2004 to 2006, were spending more than the requirement at any point. Since then, these countries have also spent less than the minimum required by the Wales Summit. There is a clear increase in the defence investment gap over time. In 2014, some countries began to reduce the size of their gap. Only Poland managed to spend more than the required level from 2020 onwards. In contrast, Czechia has the worst defence investment gap, spending only 44% of its resources on the main arms categories.

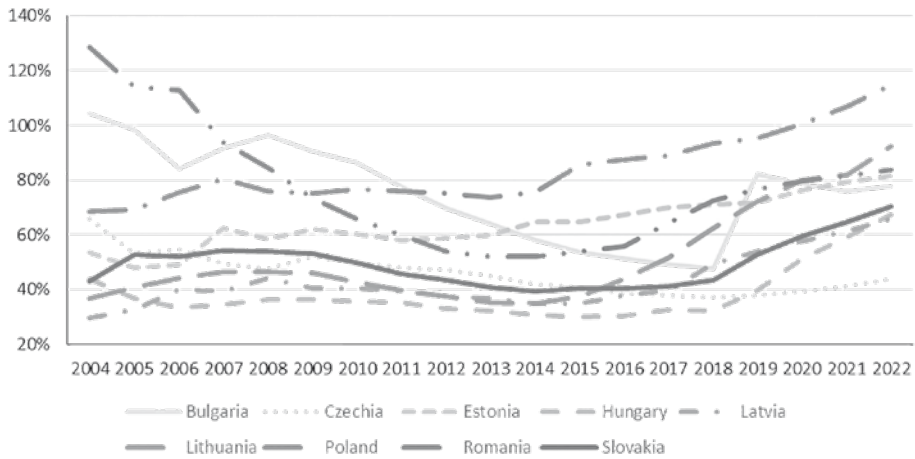


Figure 3: Cumulative gap of military investment expenditure in the case of spending 20 % of 2 % of expenditure
Source: Own processing based on data from NATO. 2024. "*Defence expenditures and NATO's 2% guideline (2004-2023)*". 2024. https://www.nato.int/cps/en/natohq/topics_49198.htm

Table 1 shows the absolute amount of accumulated gap of each B9 country in millions of USD. Only Poland exceeds the minimum spending level. Overall, the B9 countries have a comulative gap of 15,534 million USD. As mentioned above, this gap is reduced by about 25% due to Poland's overspending. In contrast, the Czechia is the largest contributor to the total gap, accounting for almost 75% of the gap. Hungary has the second-largest share of gap, followed by Romania and Slovakia.

Table 1: Cumulative defence investment gap of B9 countries 2004-2022

Country	Cumulative defence investment gap
Bulgaria	-1 051 mil. USD
Czechia	-10 466 mil. USD

Estonia	-387 mil. USD
Hungary	-3 454 mil. USD
Latvia	-850 mil. USD
Lithuania	-302 mil. USD
Poland	5 779 mil. USD
Romania	-2517 mil. USD
Slovakia	-2285 mil. USD
Total cumulative defence investment gap	-15 534 mil. USD
Total cumulative defence investment gap without Poland	-21 313 mil. USD

Source: Own processing based on data from NATO. 2024. "*Defence expenditures and NATO's 2% guideline (2004-2023)*". 2024. https://www.nato.int/cps/en/natohq/topics_49198.htm

3 THE TIME DISCONTINUITY OF THE INVESTMENT AND ITS REALISATION

Defence procurement attracts significant political and academic attention because large-scale projects are regularly delayed and cost significantly more than originally estimated. Delay issues are often linked to the deployment of new technologies (Gilli 2019), for example the construction of the aircraft carrier HMS Queen Elizabeth started in 2009 (contract signed in 2007) and did not enter service until 2017, costing £2.3 billion over time (Powell 2023). Overall, the defence procurement environment is complex, characterised by uncertainties and significant resource constraints resulting from constantly evolving threat perceptions, limited dissemination of information on new technologies, and defence-related spending (Kapil and Bhaduri. 2020).

The time lag in the implementation of defence acquisition can be divided into two basic periods. The first period is related to the government's decision that a given military equipment can be purchased for the armed forces, as well as how the purchase will be implemented (open competition, government-to-government, etc.). Delays can occur here, often lasting years. For example, Czechia knew since 2011 that it needed to replace the obsolete IFV BVP-2s, which would reach the end of their service life in 2018-2020. However, the contract for the purchase of new IFVs was only signed in 2023. The second period is characterized by the time from signing the contract to the delivery of the last piece of ordered military equipment. This period depends on various factors, including the technical level and type of military equipment, whether the equipment is produced domestically or exported, and whether the purchase includes the development of new technology.

In today's tense security situation, a significant problem is that some manufacturers operate in a peaceful supply chain mode. According to author Hellberg (2023), Swedish firms in the defence industry do not hold large stocks of raw materials, components, or

finished products, which limits their ability to produce quickly or in larger volumes in a short time. As a consequence, the Swedish Armed Forces expect deliveries of military equipment within 3-5 years of the order being placed (Hellberg 2023). In the wake of Russia's invasion of Ukraine, demand for military equipment in all categories has increased manifold. Some companies have responded by switching to "war" production. For example, the French company Nexter increased production of 155mm howitzers to eight systems per month in 2023, up from two systems per month in 2022 (Ruiteber 2023).

The time discontinuity in defence investment and its realization highlights the need for more robust and responsive procurement processes. Addressing these delays is critical for ensuring that military capabilities are maintained and enhanced in a timely manner to meet emerging security challenges.

4 DEVELOPMENT OF THE NUMBER OF ACTIVE MILITARY EQUIPMENT OF THE BUCHAREST NINE

The numbers of military equipment of each country are used in several indices, such as the Global Military Index, Global Firepower Index, and Asia Power Index. Historically, military power has been the dominant component of hard power, but in the 21st century, new challenges and technologies are emerging that are changing the nature of warfare (Mazanec and Thayer 2014). These include cyberspace, autonomous systems, and other advanced technologies, which need to be included in the measurement of military power.

One index that measures hard power is the Global Military Index (GMI), compiled annually by the Bonn International Centre for Conversion. The GMI maps the relative weight and importance of a country's military apparatus concerning its society as a whole. The index consists of a military expenditure category, a military personnel category, and a heavy weapons category. Heavy weapons, or the Heavy Weapons Index – HWI, include all items of military equipment that fall into one of four categories: armoured vehicles, artillery, combat aircraft, and major fighting ships (Global Militarisation index 2023).

For this article we have selected the categories of armoured vehicles (referred to as armoured fighting vehicles- AFV, by the IISS), artillery, combat aircraft category (we have divided it into Fixed-wing and Rotary-Wing), because some of the countries under study are without see, so we have omitted the category of large warships. Additionally, compared to the HWI index, we include in each category all equipment listed in the Military Balance+ database in the selected categories - Armoured Utility Vehicle (AUV), Armoured Reconnaissance Vehicle (ARV), training and transport aircraft, transport and multi-role helicopters.

A limitation of simply comparing numbers of military equipment is the absence of the quality dimension of military equipment. To assess the quality of military equipment, it would be appropriate methods like the Military Performance Index (MPI). This method was used in 2018 by the author Olsson (2018), who subsequently elaborated it in the assessment of the main battle tank (MBT) category. One of Olsson's conclusions is

that Western tanks have historically been better, China and Russia have been constantly catching up. The quality also depends on the generation of the equipment (Olsson 2022).

We consider Olsson's conclusions to a limited extent later in the article, when we focus not only on the change in the number of military equipment in selected categories for the B9 countries but also on the age of equipment (entry into service)[2], that each country has in 2023. Three milestones are selected for comparison of the evolution of the number of units over time, the annexation of Crimea in 2014, then the year 2021 which is not affected by Russia's invasion of Ukraine, as 2022 saw a large donation of military equipment to Ukraine as part of military aid (Trebesch et al. 2023) and an associated reduction in the number of active military equipment, and 2023, which provides the latest available data on the number of military equipment.

The existing numbers of military equipment are further supplemented by an overview of selected acquisitions (either planned or already signed) that help to increase the number of modern weapon systems. The B9 countries, as mentioned in the article, are former Warsaw Pact countries, which means that all countries had or still have Soviet-type equipment. After the annexation of Crimea, data shows a gradual renewal of military equipment, mainly by switching to Western-type equipment to ensure NATO interoperable standards (e.g. switching from 152mm to 155mm artillery calibre). Data on the numbers of military equipment and acquisitions are from the Military Balance+ database.

4.1 Bulgaria

Bulgaria became a NATO member in 2004, but still relies on outdated Soviet weapons. Modernisation projects and equipment purchases have been delayed, with the Russian invasion of Ukraine serving as a significant wake-up call for the country. The mainstay of the ground forces includes Soviet equipment, such as the infantry fighting vehicles (IFV) BMP-1 (1966) and BMP-23 (1980), MBT T-72 (1973) and T-72M1 (1986), and the armoured personnel carrier (APC) MT-LB (1970) and BTR-60 (1959). The artillery is mostly Soviet-made and obsolete, with examples including the 2S1 Gvozdika (1969) and BM-21 Grad (1963). In the fixed-wing aircraft category, the mainstays are Soviet-made MiG-29 (1983) and Su-25K (1981), with the last units of the obsolete MiG-21 (1959) retired in 2015. Currently, Bulgaria participates in NATO Air Policing missions due to the limited number of combat aircraft in the country. In the rotary wing category, the Bulgarian Air Force had 33 machines in 2014, including 6 Mil Mi-24 attack helicopters (1972). A summary of the changes in the number of active equipment is shown in Figure 4.

2 The years (decades) in which the type of equipment was put into service are listed, source data from the Military Balance+ database.

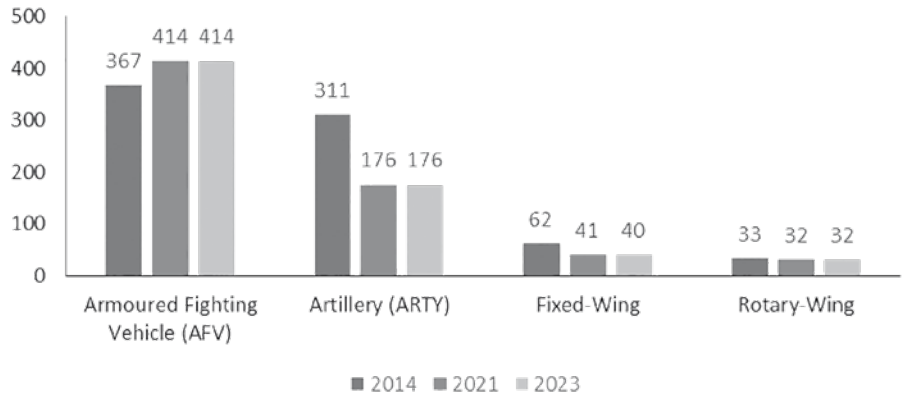


Figure 4: Inventory of active military equipment by category - Bulgaria
Source: own processing, data from database Military Balance+ (2024)

By 2023, purchases of new Plasan Sand Cat AUVs and M1117 ASVs were made, and a replacement for the destroyed AS532AL Cougar was provided with one Multi-Role Helicopter AS365N3. To increase capability, the T-72M1 MBTs were upgraded and increased in number (Fiorenza 2022). Furthermore, Bulgaria expects to receive new F-16 Block 70s in 2025. Before these aircraft are delivered, the existing MiG-29s will be upgraded (Radio Bulgaria 2023). A significant future acquisition that has been in negotiations since 2018, but no contract has been signed yet, is the purchase of 183 IFV Stryker units. Bulgaria has also expressed interest in acquiring Turkey's Bayraktar TB2 and Akıncı UCAVs to address current shortcomings in their UAV capabilities.

4.2 Czechia

Czechia has been a member of NATO since 1999. In 2023, a new Security Strategy of the Czech Republic was created primarily to respond to the deteriorated security environment in connection with Russia's invasion of Ukraine. The core of the ground forces consists of 120 BMP-2 IVFs (1980), 107 KBVP Pandur II CZ (2007), 26 APC Titus (2013), MBT on two platforms 30 T-72M4CZ (2003) and 3 Leopard 2A4 (1985), ARV include 34 BPzV Svatava (1990) and 16 Pandur II (2013). The artillery includes 48 152mm Self-Propelled Howitzers (SPHs) M77-Dana (1980), which are slated to be replaced by a new 155mm SPHs, 48 mortars 120mm M-1982 (1987) and 120mm SPM-85 (1990). In the fixed-wing category, the Air Force has 12+2 JAS 39 Gripen C+D (2002), and in the rotary-wing category they have 17 Mil Mi-24 attack helicopters (Hind D and Hind E), which are

still in service but awaiting replacement, AH-1Z helicopters. An overview of the changes in the number of active equipment is shown in Figure 5.

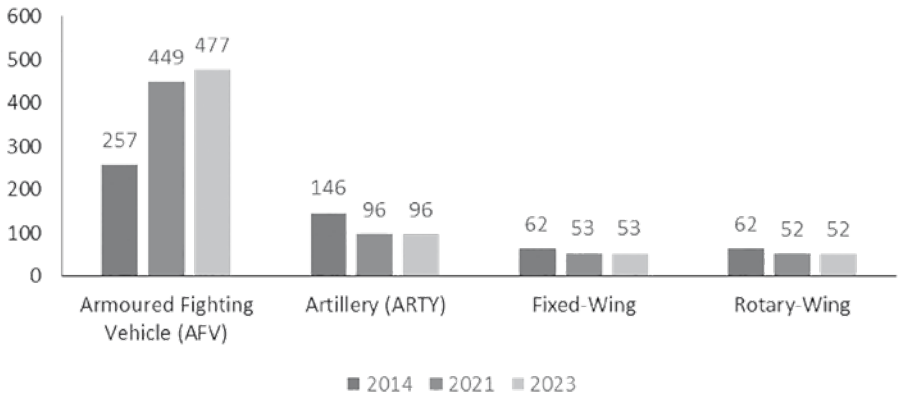


Figure 5: Inventory of active military equipment by category - Czechia
Source: own processing, data from database Military Balance+ (2024)

Czechia has been one of the leaders in aid to Ukraine, sending decommissioned equipment in large numbers. However, there is not much military equipment left to send (Government of the Czech Republic 2023). Military modernization priorities include IFVs, SPHs, multi-role helicopters, transport aircraft, short-range air defence systems, and UAVs. The government announced in 2023 that it would buy F-35 Lightning II fighter jets to replace leased Gripen aircraft and signed a contract in late January 2024.

4.3 Estonia

Estonia has been a member of NATO since 2004. Due to its small active army, Estonia relies heavily on membership as a security guarantor. The National Defence Development Plan 2031 focuses on improving territorial defence, indirect fire and anti-tank capabilities, as well as strengthening maritime and surveillance systems. The core of Estonia's AFV category consists of APCs, including the older Finnish XA-180 Sisu (1984) and the newer XA-188 Sisu, 44 CV9035EE IFVs (1994). In 2014, Estonia had 376 pieces of artillery equipment (howitzers and mortars). By 2023, this number was reduced to 168 pieces, as some equipment was decommissioned or sent as assistance to Ukraine. In 2016, Estonia initiated the selection of a new 155mm SPHs and chose the South Korean K9 Thunder in 2018, with the first deliveries starting in 2020. Estonia does not possess combat fixed-wing or rotary-wing aircraft; it relies on other NATO members for air capabilities through the Baltic Air Policing mission. Estonia's air assets are limited to transport aircraft and helicopters, with no plans for future acquisitions of combat aircraft

or helicopters. An overview of the number of active military equipment by category in selected years is shown in Figure 6.

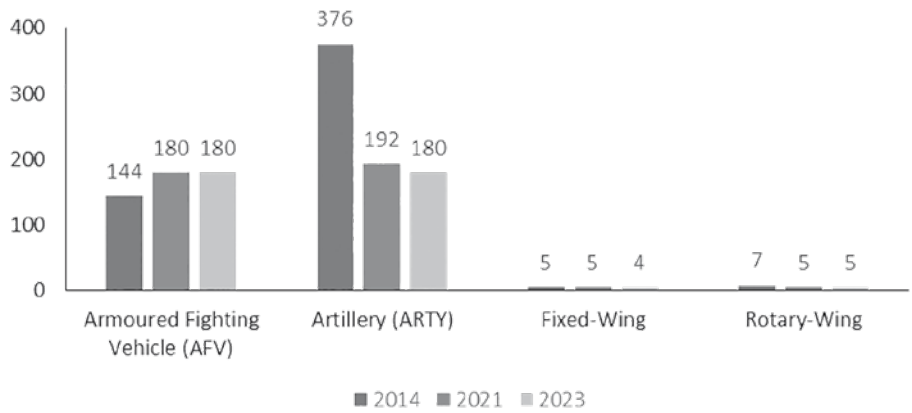


Figure 6: Inventory of active military equipment by category - Estonia
Source: own processing, data from database Military Balance+ (2024)

Estonia is acquiring missile artillery systems from the US, medium-range air defence systems from Latvia, and point-range air defence systems from Poland. Estonia has joined the German European Sky Shield Initiative (NATO 2023c) to bolster regional air defence capabilities. Following Russia's invasion of Ukraine, the National Defence Development Plan is being updated, with Estonia will committing to increase defence spending to 3% of GDP (Estonian Ministry of Defence 2023). The focus will be on acquiring additional ammunition, increasing troop resilience, and enhancing artillery and intelligence capabilities.

4.4 Hungary

Hungary published its National Security Strategy in April 2020 and the National Military Strategy in June 2021, these documents reflect the deteriorating security environment. Other important documents include the Zrínyi 2026 Defence and Military Development Program (Balogh 2019). In 2014, Hungary's ground forces primarily relied on Soviet equipment, including 328 BTR-80 APCs (1986) and 120 BTR-80A APCs (1994), as well as 30 T-72 MBTs (1973). As part of the rearmament process, some BTR-80s were retired the 80A versions were upgraded to the 80AM version, and 44 upgraded T-72M1 tanks were added. In 2018, contracts were awarded for 44 Leopard 2A7HU MBTs and 209 KF41 Lynx IFVs. As part of the transition to the new Leopard 2 tank platform, 12 Leopard 2A4HU tanks are currently available (Petrov 2023). In the field of artillery, the basic was 18 152mm towed howitzers D-20 (1955) and 50 82mm mortars. In 2018 an order for

24 155mm PzH 2000 SPHs (1998) was placed, with 21 pieces currently in service. The air force is based on 12 JAS 39 Gripen C and 2 JAS 39 Gripen D aircraft, and 8 Mi-24 attack helicopters (1976 and 1981). The Hungarian Defence Forces considering purchasing new attack helicopters (Hungary Today 2023). An overview of changes in the number of active military equipment in selected categories is shown in Figure 7.

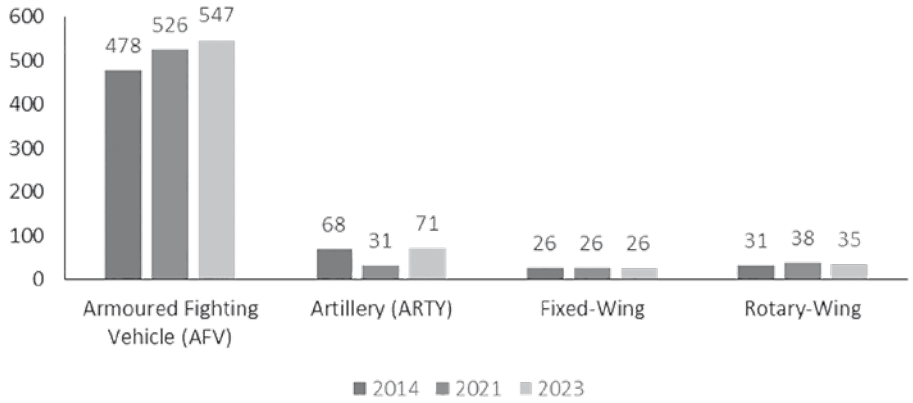


Figure 7: Inventory of active military equipment by category - Hungary
Source: own processing, data from database Military Balance+ (2024)

The Hungarian Defence Forces are modernising and purchasing NASAMS air defence systems, PzH 2000 artillery equipment, medium transport aircraft K-390, and Leopard 2A7+ MBTs. Hungary's defence industrial base is limited but developing. In 2023 Rheinmetall opened a factory to produce the IFV Lynx, among other equipment.

4.5 Latvia

Another Baltic state, Latvia, does not have a large armed force and relies on NATO membership as a security guarantee. Following the invasion of Ukraine in February 2022, Latvia increased defence spending, and the September 2023 National Security Concept (Latvian Public Broadcasting 2023) emphasizes societal resilience and comprehensive defence. Latvia plans to significantly increase the size of its armed forces. The AFV category of the ground force in 2023 is based on 180 FV107 Scimitar (2010), which is an armoured tracked military reconnaissance vehicle (sometimes classed as a light tank), and 34 Patria 6x6 APCs (2021). The Latvian artillery currently has 59 155mm M109A5ÖE SPHs (1990s), as well as 25 120mm mortars M120 (1991) and 28 81mm mortar L16 (1965). As in the case of Estonia, the air force does not have combat equipment and Latvia relies on the military capabilities of NATO allies. Latvia has only transport aircraft

and helicopters. Figure 8 shows that Latvia is increasing the number of its ground and artillery equipment, but the text indicates that this is primarily new equipment.

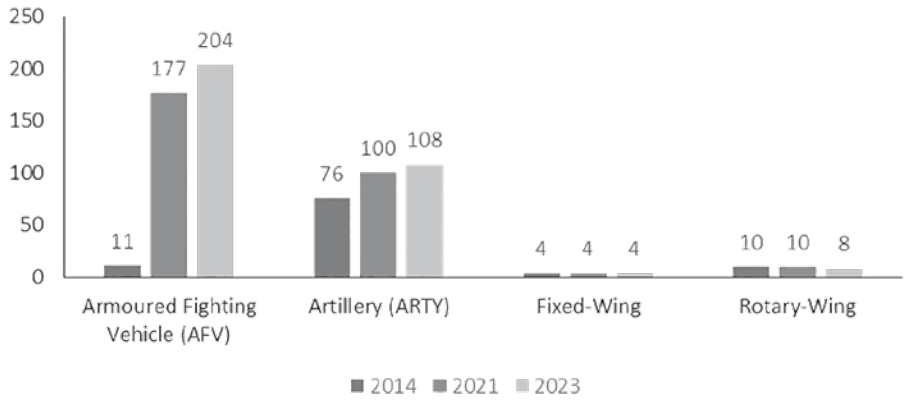


Figure 8: Inventory of active military equipment by category - Latvia
Source: own processing, data from database Military Balance+ (2024)

Latvia has recently recapitalised its artillery capability with second-hand howitzers from Austria and is procuring medium-range air defence together with Estonia, with other procurements also underway, e.g. Patria 6x6 APCs and UH-60M Black Hawk. Latvia has only specialised defence and industrial capabilities, with a focus on cyber security (International Institute for Strategic Studies. 2024).

4.6 Lithuania

The Lithuanian Armed Forces focus primarily on preserving sovereignty and territorial integrity, although they rely on NATO membership for their security (Dudzińska, 2023). The country adopted a new National Security Strategy in December 2021, based on the deteriorating security environment in the region. In response to Russia's invasion of Ukraine, Lithuania plans to increase defence spending, and is revising its 2018 10-year national defence development program. Lithuanian Land Forces in the AFV category have 214 M113A1 APCs (1960) and 22 M577 APCs (1963), 89 Boxer IFVs (2011) and 200 JLTV AUV s (2016). The purchase of a new MBT is still pending. The core of the artillery is 16 155mm PzH 2000 SPH s (1998), 42 120mm mortars and newly ordered from 2022 are 18 CEASAR PZHs. Like the other Baltic states, the air force does not have combat equipment, only transport aircraft and helicopters. The country relies on the military capabilities of NATO allies. Like Latvia, Lithuania is increasing the numbers and improving the quality of its ground forces equipment; an overview of the development of the number of active equipment is shown in Figure 9.

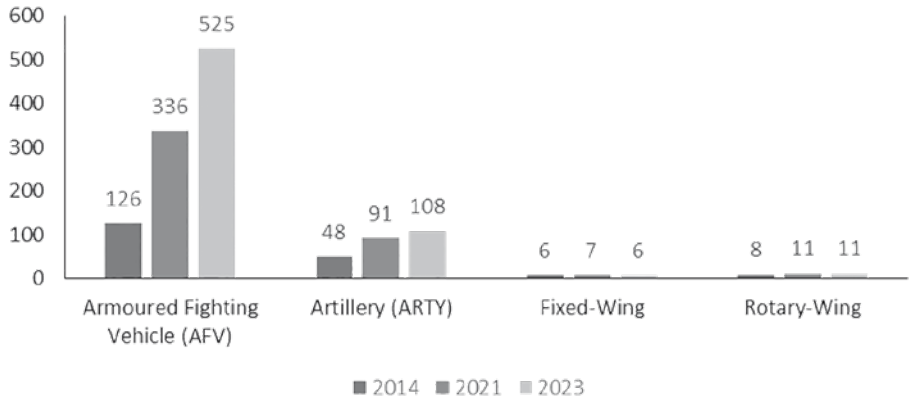


Figure 9: Inventory of active military equipment by category - Lithuania
Source: own processing, data from database Military Balance+ (2024)

Lithuania joins the German-led European Sky Shield initiative to strengthen air defence capabilities. The government is planning major improvements to its defence infrastructure and upgrading other parts of its defence capability, such as the purchase of CAESAR artillery systems. Other acquisitions include M142-HIMARS MRLs, UH-60M Black Hawk, Boxer IFVs, and M577 V2 APCs (Military Balance+ 2024).

4.7 Poland

The pillar of Polish defence policy is ground defence and NATO membership. The strategic document Defence Concept 2017-2032 (Ministry of National Defence Republic of Poland 2016) primarily focuses on preparing the armed forces to deter Russian aggression. In response to Russia's large-scale invasion of neighbouring Ukraine, Poland is seeking to expand the size of its army (to 300,000) and is making arms purchases to bolster its defences and replenish its stocks. Poland has donated so many aircraft, tanks, guns, combat vehicles, and other equipment to Ukraine that without rapid resupply it would be on track to lose nearly half its capabilities (Sierakowski, 2023).

Polish ground forces possess 40% of the AFVs of all B9 members. Therefore, only the most important platforms of each type of military equipment are selected below. The APC category is represented by 300 Rosomak APCs (2013), 352 BRDM-2 ARVs (1962), and the IFV category by 916 BMP-1 (1966) and 315 Rosomak IFVs (2003). The MBT category is represented by four platforms 201 PT-91 Twardy, 233 Leopard 2A4, 2A5, APL, 28 K2 (2014), 28 M1A2 Abrams (1992) and 14 M1A1 Abrams (1985). The artillery has increased the number of equipment by 2023. The main representatives being 108 152mm M-77 Dana SPHs (1980), 74 155mm K9A1 Thunder SPHs (2018) and Crab (2016). They

also have 131 122mm Multiple Rocket Launcher (MLR) Grad MRL and RM-70 MRL, 7 M142 HIMARS (2002) and 3 K239 Chunmoo (2015). The air force's fixed-wing category includes 48 F-16C/D (Block 52+) Fighting Falcon (2003), 14 MiG-29 (1983) and 16 Su--22M4 (1970). The rotary-wing category is represented by the Soviet equipment design family Mil Mi-X with 122 pieces, including 16 Mil-24 Hind D and Hind E, and 63 pieces of PZL W-3 Sokol. These are complemented by Western manufacturers with units such as the S-70i Black Hawk. The complete development of the number of active military equipment over time is shown in Figure 10.

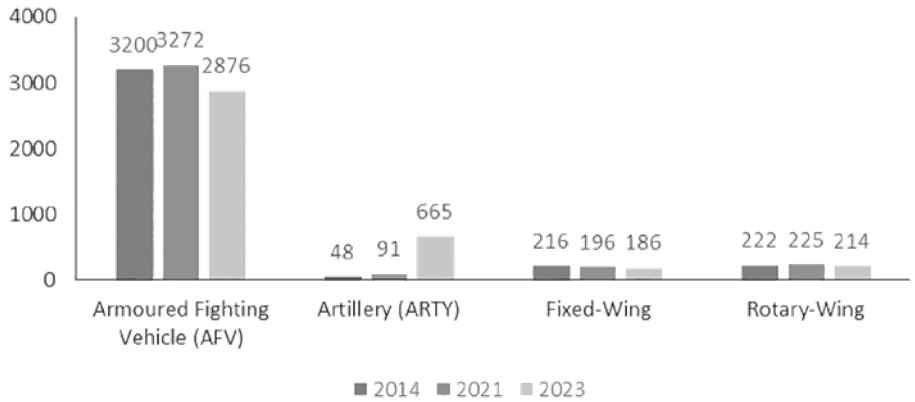


Figure 10: Inventory of active military equipment by category - Poland
Source: own processing, data from database Military Balance+ (2024)

In October 2019, the "Technical Modernization Plan" (Plan Modernizacji Technicznej) for the period 2021-35 (The Military Balance, 2023) was released, extending the planning horizon from ten to fifteen years. The modernization effort includes, among other things, the F-35A fighter, which is due to arrive in Poland in 2024, and ground force capabilities. Warsaw continues to work on strengthening its defence industrial base, much of which is now consolidated in the state-holding company PGZ, using technology transfers and international partnership agreements. In the last 10 years, Poland has made dozens of major acquisitions (e.g. MQ-9A Reaper, 155mm Krab SPHs, M903 Patriot PAC-3 MSE, Leopard 2PL).

4.8 Romania

The Romanian armed forces are primarily oriented towards territorial defence. According to the National Defence Strategy 2020-2024, the main security threats include Russia's presence in the Black Sea, cyber-attacks, and terrorism. In 2023, the government announced that it was increasing defence spending to 2.5% of GDP (Klepanchuk, 2023). The backbone of the ground forces is the armoured vehicles including APCs 76 ROMARM

MLVMs (1980s), 69 B33 TAB Zimbru (1990s), 354 TAB-71 (1971), 153 TAB-77 (1977) and the latest 31 Piranha IIIC (2007). IFV category includes 101 MLI-84 (1985), 41 MLI-84M (1995) and 99 Piranha V IFVs (2015), MBTs are represented by the T-54/T-55 platform, including 220 T-55AMs (1970s), 103 TR-85s (1986) and 54 TR-85M1s (2007). The artillery has 447 152mm towed artillery, 170 122mm Grad MRL (1963) on two mobile platforms, 443 82mm mortar and 120mm mortar M-1982, 6 Piranha IIIC with Cardom and the latest equipment are 36 227mm MRL M142 HIMARS. The air force's fixed-wing category is based on 17 F-16AMs (2002) and the rotary-wing category includes 21 multi-role helicopter IAR-330 SOCAT Puma (1975) and 8 SA316B Alouette III (1961). The evolution of the number of active military equipment in the period under review is shown in Figure 11.

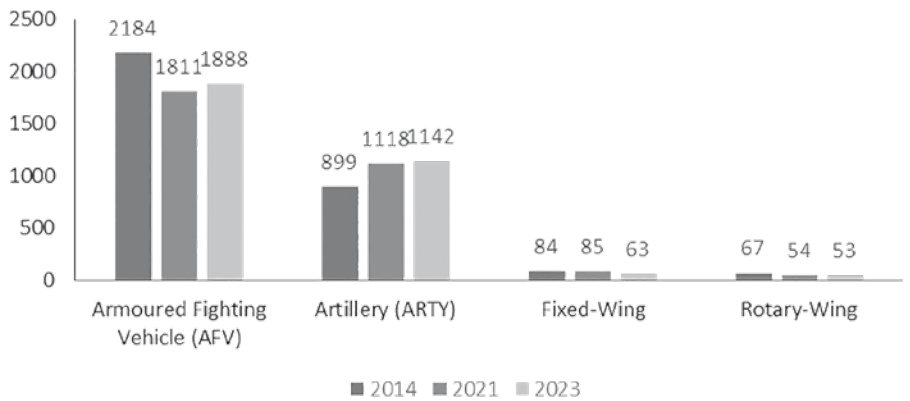


Figure 11: Inventory of active military equipment by category - Romania
Source: own processing, data from database Military Balance+ (2024)

As part of the transformation of the armed forces, Romania is trying to modernize its military to NATO standards, and the Armed Forces Transformation Program was updated in 2022. The country retired the last MiG-21 Lancer fighters in May 2023, which are being replaced by F-16s. In 2023, Romania agreed to purchase F-35 Lightning II fighters and Bayraktar TB2 drones from Turkey, among other modernization efforts.

4.9 Slovakia

Slovakia seeks to modernise its armed forces and replace obsolete equipment. In 2017, the government approved the Long-Term Defence Development Plan, and in 2021 the New National Security Strategy and the New Defence Strategy were approved. Historically, like Hungary, Slovakia has had positive attitudes towards Russia, and political representation tends towards a national, anti-Western, and pro-Russian policy. These manifestations may influence the future development of Visegrad-EU relations

(Visnovsky 2020). The core of the ground forces is mostly outdated equipment and Slovakia is already dealing with upgrades of existing equipment and acquisition of new IFVs and MBTs. In 2023 Slovakia had 79 APCs OT-90 (1990) and OT-64 (1963), 105 BMP-1 IFVs (1966), 91 BMP-2 IFVs (1980) and 17 BMP-M IFVs (2016-17). The tank force is represented by two platforms, 30 units of T-72M and 3 units of Leopard 2A4. The artillery includes 4 122mm MRL RM-70 and 26 RM-70/85 MODULAR, 16 155mm M-2000 Zuzana SPHs (1998), 3 152mm M-77 Dana SPHs (1980), and from 2021 11 155mm Zuzana-2 SPHs (2014). The air force currently has only training aircraft L-39 Albatros and transport aircraft in the fixed-wing category. Fighters MiG-29 were scrapped, with some given as assistance to Ukraine. The rotary-wing category is represented by 9 UH-60M Black Hawk (2006) and 13 Mi-17 Hip H (1977). An overview of the development of the number of active military equipment is shown in Figure 12.

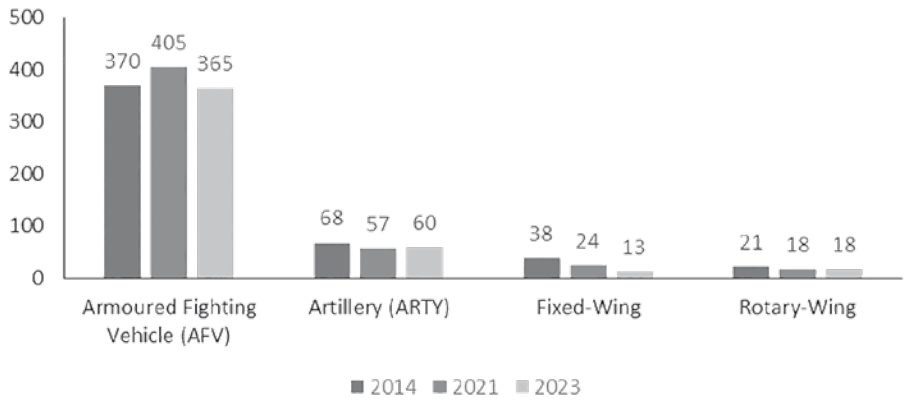


Figure 12: Inventory of active military equipment by category - Slovakia
Source: own processing, data from database Military Balance+ (2024)

In 2022, a Defence Cooperation Agreement was signed with the US and funds were allocated to Slovakia under the Foreign Military Financing Programme to help the country replace some of the military equipment sent to Ukraine after the Russian invasion. In 2022, Germany began delivering Leopard 2A4 MBTs to Slovakia. Other acquisitions include IFVs Patria AMV and CV9032, and F-16 C/D (Block 70).

CONCLUSION

The change in the security environment following the annexation of Crimea in 2014 and the subsequent invasion of Ukraine by Russian forces in 2022 has altered the perception of a direct threat to NATO member states. In 2015, the Bucharest Nine (B9) was formed in this context. This group shares a history of being part of the Warsaw Pact before the breakup of the Soviet Union and then successively becoming NATO members

from 1999 and 2004. Their common history is reflected, in the structure of their equipment much of which originated in the former Soviet Union or was licensed to the Warsaw Pact countries. This starting position determined part of their defence capabilities, which were to be gradually reoriented and revised after NATO accession (Erasymchuk 2021). The actual preparedness of the B9 countries to perform their strategic tasks is related, among other things, to the state of military equipment available to their forces. The change in the quantity and structure of equipment is in turn related to the amount of resources spent on the purchase of military equipment.

The change in the security situation, along with the unsatisfactory situation both in terms of the volume of spending and the distribution of spending across categories, was reflected in the pledge made at the NATO Summit in Wales. It was officially stated that the allies currently spending at least 2% of their GDP on defence, would continue to aim to maintain this share. Furthermore, it was stipulated that allies spending more than 20% of their defence budgets on military equipment, including related research and development, would continue to pursue this range. Allies whose current share of GDP spent on defence was below the set level were pledge to stop any decline in defence spending and to seek to increase defence spending in the future. The target was set within a 10-year horizon with 2024 identified as a key milestone (NATO 2014).

Considering the stated pledge as the minimum required level of total defence spending, as well as the minimum required level of capital expenditure on military equipment, it shows how the defence investment gap of unrealised purchases by the B9 countries has increased since 2004. The total amount of this gap amounts to 15 534 million USD. The largest contributor to this gap is the Czechia with a cumulative gap of 10 466 million USD. This gap represents more than 75% of the total gap. On the other hand Poland, spends more than the minimum and thus partly reduces the total B9 defence investment gap. However, there is a clear positive trend in the gap dynamics in the form of a reduction since 2014 and an increase in funds spent on investments in military equipment. This is also reflected in the transformation of the structure of military equipment and the number of new acquisitions.

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