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# 'Explaining the persistence of defense offsets in a supply-driven arms trade'

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## ABSTRACT

Historically, defense offsets have been viewed as a feature of buyer-driven markets, where surplus supply of weapons gives buyer states the leverage to demand additional industrial and technological benefits from foreign suppliers. However, in the wake of Russia's invasion of Ukraine, the global arms trade has shifted to a supply-driven market, where demand outstrips supply. Despite this shift, countries in Central and Eastern Europe (CEE) have continued to prioritize offsets, even though their bargaining power has diminished. This paper seeks to explain this apparent paradox through an inductive research design and qualitative methods, ultimately proposing a new theoretical framework based on three key factors: the growing drive for self-sufficiency, the strategic importance of government-to-government relationships, and the long-term planning horizons associated with defense procurement in the region. By analyzing recent offset agreements in CEE, it demonstrates how these factors collectively sustain offset demands – even in a supply-constrained market – while also providing insights into broader dynamics in global defense trade as well as arms collaboration.

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## Introduction

Historically, defense offsets have been viewed as a feature of buyer-driven markets, where the surplus supply of weapons gives buyer states the leverage to demand additional industrial and technological benefits from foreign suppliers (Anicetti 2024a, 15; Balakrishnan 2019; Bitzinger 1994; Brauer and Paul Dunne 2004; Hammond 1992, 208; Matthews 2019, 148). However, in the wake of Russia's invasion of Ukraine, the global arms trade has shifted to a supply-driven market, where demand outstrips supply (Scarazzato et al. 2024; Tian et al. 2024). Despite this shift, countries in Central and Eastern Europe (CEE) have continued to prioritize offsets (Anicetti 2024b), even though their bargaining power has diminished. This paper examines this apparent paradox using an inductive research design and qualitative methods,<sup>1</sup> ultimately proposing a new theoretical framework based on three key factors: the growing drive for self-sufficiency, the strategic importance of government-to-government (G2G) relationships, and the long-term horizons for offset implementation in the region. By analyzing recent offset agreements in CEE, it demonstrates how these factors collectively sustain offset demand – even in a supply-constrained market – while also providing insights into broader dynamics of global defense trade and arms collaboration.

Buyer states pursue offsets not merely to mitigate the costs of foreign acquisitions but to strengthen their self-sufficiency. Despite their diminished bargaining power, these states successfully secure offsets because original equipment manufacturers (OEMs) are allowed to spread investment obligations over extended timelines. Home governments play a central role in enabling offsets to flourish under these changed conditions. By committing to long-term security agreements, they incentivize OEMs to collaborate and provide buyer states with the necessary assurances to accept deferred offset investments.

Empirically, this paper presents groundbreaking evidence on offsets in a supply-driven arms trade and provides the first systematic analysis of offsets in CEE countries. Theoretically, it develops a robust framework that challenges the prevailing assumption that offsets are exclusive to buyer-driven markets, broadening the concept to encompass a wider range of market dynamics.

While some scholars and military professionals have acknowledged the potential of offsets to advance strategic objectives (Anicetti 2024a, 11; Balakrishnan 2019; Hammond 1992, 209; Petty 1999, 22), their contributions remain limited in scope and lack theoretical depth. These works offer little insight into how non-market factors sustain offset arrangements. Specifically, this body of scholarship fails to explain how buyer states navigate pressures for rapid military acquisitions and reduced bargaining power, while also overlooking the critical role of home governments in shaping offset agreements within a seller-dominated arms market.

The paper is organized into six sections. Following this introduction, the second section defines offsets and highlights conventional assumptions about their typical role in buyer-driven markets. The third section examines the shift to a supply-driven market in the wake of the Ukraine invasion. It then focuses on Central and Eastern Europe, where urgent defense needs following the invasion present a surprising case for the prioritization of offsets. The fourth section provides evidence of CEE offsets during the 2022–2024 period. Building on this evidence, the fifth section introduces a new theoretical framework centered on three key factors – self-sufficiency, government-to-government (G2G) relationships, and long-term horizons – to explain the persistence of offsets in supply-driven markets. Finally, the conclusion summarizes the findings, discusses the paper's contributions, and explores theoretical implications for other supply-driven markets in regions such as the Middle East, Asia-Pacific, and Latin America.

## Defense offsets: offspring of a buyers' market

Defense offsets have been concisely and effectively defined as compensation to states for buying foreign weapons (BIS 2025). Contrary to most sellers that compete on price and quality only, arms manufacturers are often required to pair their offering with offset packages including, for instance, technology transfer, the localization of segments of manufacturing activity, or export licenses (Udis 2009). To paraphrase the ancient Greek military historian Thucydides (1974), buyer states demand offsets because they can, whereas foreign vendors supply offsets because they must.

Defense economists and scholars of security studies broadly agree that defense offsets are primarily driven by a buyer's market—one in which supply exceeds demand, granting buyers the leverage to extract additional benefits from foreign sellers (Anicetti 2024a, 15; Balakrishnan 2019; Bitzinger 1994; Brauer and Paul Dunne 2004; Hammond 1992, 208; Matthews 2019, 148). The defense industry being technological and capital intensive it requires large economies of scale that virtually no state alone can provide (Bitzinger 2009; DeVore 2013; Krause 1992). Hence, arms manufacturers have long looked beyond domestic markets to sustain their production. The scramble for export markets translates in heightened competition among producers, forcing them to give in to buyers' demands for technology, know-how, and employment.

A buyers' market for defense equipment first emerged in the second half of the 19th century (Krause 1992, 56). The Industrial Revolution triggered great advancements in military technology but also raised the cost of developing increasingly sophisticated weapons (Buzan and Herring

1998, 12). As domestic markets were no longer sufficient to achieve the necessary economies of scale to sustain production, first-tier arms producers – mostly British and German primes – turned to foreign markets (Krause 1992, 59). The ensuing, fierce competition forced producers to transfer technology, localize manufacturing, or granting export licenses to buyer states in Europe and Asia.

Most recently, a buyers' market existed between the fall of the Soviet Union in 1991 and Russia's invasion of Ukraine in 2022 (Balakrishnan 2019; Matthews 2019, 148). For more than 30 years, the so-called peace dividend – downsized defense budgets in North America and Europe – translated in greater competition among OEMs. Particularly Western European and Russian manufacturers looked on foreign markets to sustain their economies of scale and keep up with the ever-increasing cost of developing advanced weapon systems (Cevasco 2009; Hartley 2020; Markowsky, Brauer, and Hartley 2023). To win over buyer states, these same OEMs had to increasingly rely on offset benefits beyond the weapon systems themselves. As a result, offsets increased in both scale and scope. In 2021, approximately 100 states requested offsets or similar arrangements, with offsets accounting for dozens of billions of dollars – half the global arms trade business (Matthews and Anicetti 2021, 54).

### Welcome to the seller's market

Since 2022, the global arms trade is no longer defined by a buyers' market. Major crises in Europe, the Middle East and Asia have pushed demand for weapons to Cold-War levels (Tian et al. 2024). In fact, Russian invasion of Ukraine in February 2022, the outbreak of war in the Middle East the following year, and the increasing tensions in South-East Asia have pushed global spending to the highest level ever recorded (Tian et al. 2024). Simultaneously, arms supplies have fallen short (Scarazzato et al. 2024). On the one hand, the long tail of the COVID-19 pandemic has constrained defense supply chains, reducing the reactivity of the industry to the stronger demand for weapons. On the other hand, the peace dividend finally demanded its toll, especially in Europe. Decades of underinvestment and peace-time production focused on asymmetric and small-scale conflicts left the Old Continent unprepared to quickly scale up war-time production.

The ensuing suppliers' market is of course good news for defense companies, which have seen their order backlog grow at unprecedented levels (Scarazzato et al. 2024). But 'not so much for buyer states,' as acknowledged by Hufschmid (2024), Offset Manager at the Swiss Federal Office for Defence Procurement (armasuisse), while speaking at the Global Industrial Cooperation Association (GICA) Autumn Conference in November 2024. According to Hufschmid (2024), the reality of a seller's market has already translated in less competition, higher prices, and longer waiting times for buyer states.

While the new seller's market is a global phenomenon, nowhere are its dynamics more evident than in Central and Eastern Europe, especially in former Warsaw Pact members – such as Bulgaria, Czechia, Hungary, Poland, Romania, and Slovakia – as well as other post-Soviet states, including Estonia, Latvia, Lithuania, and Ukraine. Following Russia's full-scale invasion, the sub-region has seen one of the steepest increases in defense spending worldwide, namely 42.6 percent between 2022 and 2023 (SIPRI 2024a), well above the 6.8 percent global average for the same period (Tian et al. 2024). Furthermore, CEE countries allocate a relatively larger share of their military spending to defense procurement rather than to personnel, operations, and other expenses. Compared to the global average of 20 percent (Guevara 2024), CEE countries dedicate on average more than one-third of their defense budgets to new acquisitions (NATO 2024). Notably, Poland and Hungary allocate up to half of their defense budgets, while Ukraine spends half of its overall revenues on defense procurement (Financial Times 2024).

To satisfy their outstanding and urgent requirements, CEE countries must rely on foreign suppliers, as their defense technological and industrial base (DTIB) is unable to produce most NATO-standard defense equipment. However, with arms in short supply, conventional theories of buyer-driven markets suggest that these countries would prioritize quick delivery over offsets, which

typically involve lengthy negotiations. Most importantly, due to CEE countries diminished bargaining power, conventional theories predict that foreign suppliers would resist potential offset demands.

Yet, contrary to conventional wisdom, defense offset deals in Central and Eastern Europe have flourished between 2022 and 2024. To solve this theoretical puzzle, the next section examines the evidence, highlighting the patterns within it, before formulating the first theory of offsets in an arms seller's market.

## Defense offsets in Central and Eastern Europe 2022–2024

Except for Ukraine, CEE countries are all members of the European Union (and NATO). As such, they are bound by the EU Defense Directive and art. 346 of the Treaty on the Functioning of the European Union (European Union 2009a, 2009b). In short, EU members are allowed to demand offsets only under exceptional circumstances such as government-to-government procurement, NATO and OCCAR procurement involving one or more European state(s), or for reasons of national security.

However, in March 2021, the European Parliament's Committee on the Internal Market and Consumer Protection conducted a study of the EU Defense Directive, deploring 'the widespread use of exemptions and the persistence of offset requirements' (European Parliament 2021). Among EU member states that entered offset arrangements between 2014–2021<sup>2</sup> featured many CEE countries, including Bulgaria, Czechia, Hungary, Poland, Romania, and Slovakia (SIPRI 2024b). Unrestricted by EU regulations, Ukraine was by far the region's largest advocate for (defense) offsets, seeing them as a driver for both self-sufficiency and economic development. In fact, contrary to EU countries – all bound by the WTO Government Procurement Agreement – Ukraine requested compensation also for commercial purchases such as public transport or telecom equipment.<sup>3</sup>

CEE states have continued prioritizing offsets in the new arms seller's market. In fact, offset arrangements in Central and Eastern Europe appear to have increased between 2022 and 2024. More countries have joined the offset game, while those already participating have doubled down on it, exploiting opportunities created by plentiful military acquisitions.

## Ukraine

In the months following Russia's full-scale invasion, and consistent with conventional theories, Ukraine set aside offset demands, prioritizing the acceleration of military aid from the US and European allies, as well as the development of a 'strategic rear' – a secure network of neighboring countries positioned to supply equipment, provide spare parts, and perform upgrades with minimal delays (The Kyiv Independent 2022; Pavlysh 2022). However, within a year, Kyiv resumed calls for joint production and local investment (Kossov 2023). Ukraine saw defense offsets as key to (re) building its DTIB and, thus, increasing self-sufficiency.

In July 2023, speaking to national radio, Ukraine's Minister of Strategic Industry, Oleksandr Kamyshin, stated that the country should transition from being the 'breadbasket of Europe' to being the 'arsenal of the free world' (Ministry of Strategic Industries of Ukraine 2023a). 'This should be our main goal, considering the enemy we have on our borders,' said the Minister – a concept later reiterated by President Volodymyr Zelensky at the First International Defense Industries Forum in Kyiv in September 2023 (President of Ukraine 2023). Two months later, speaking before the European Defence Agency (EDA), Kamyshin clarified that this goal would be achieved through offsets, including joint ventures, licensed production, research and development, and the supply of components (Ministry of Strategic Industries of Ukraine 2023b). According to Kamyshin, even after the war is over, Ukraine should focus on arms production and export (Walker 2023).

Meanwhile, despite Ukraine becoming the world's eighth-largest military spender (Tian et al. 2024), foreign arms suppliers initially refrained from localizing defense production activities in the country. It soon became clear that, as long as Russia posed a significant aerial threat, strong government support was necessary for foreign suppliers to acquiesce to

Ukraine's offset demands. For example, in 2023, Finnish firm Patria explored the possibility of producing combat vehicles in Ukraine, but the firm's CEO made it clear that without Finnish government support, it would be too risky to engage in license production or co-production in Ukraine (Kauranen 2023). In February 2024, a member of the Verkhovna Rada (Ukrainian Parliament) Committee on National Security, Defence, and Intelligence admitted that 'there are not many... companies that have taken the initiative on their own' (Neplii 2024). In fact, as Fiott (2024) noted in a recent policy paper, 'defense firms have waited for signals from their governments to forge security agreements with Ukraine before venturing into the Ukrainian defense market.'

Such signals began to emerge in mid-2023, when G7 members declared long-term support for Ukraine (European Council 2023). Since then, Ukraine has signed 10 year security cooperation agreements with 29 states, as well as with the EU (European Commission 2024b, NATO 2025).<sup>4</sup> As Western suppliers struggled with depleting stocks and recognized the strategic need to move supply chains closer to the front line, most of these agreements included industrial cooperation clauses. In March 2024, the EU even made explicit reference to joint production with Ukraine in its first-ever military-industrial strategy, EDIS (European Commission 2024a). Reassured by government commitments, foreign arms manufacturers began entering offset deals with Ukraine. In October 2023, for example, after receiving approval from the German Federal Cartel Office, Germany's defense manufacturer Rheinmetall (2023a, 2023b) and the Ukrainian defense industry association UDI established a joint venture in Kyiv to produce and repair tanks. In July 2024, based on a Memorandum of Understanding (MoU) that included the possibility of transferring technical know-how, Rheinmetall began constructing an ammunition factory in Ukraine in collaboration with a local company (Defence Industry Europe 2024a). Reportedly, Rheinmetall plans to open at least four plants in Ukraine to produce artillery shells, military vehicles, gunpowder, and anti-aircraft weapons (Fornusek 2024). Another German company, Quantum Systems, has opened a drone factory and development hub in Ukraine, while Flensburger Fahrzeugbau Gesellschaft is building a repair hub for armored vehicles and Leopard tanks in the western part of the country (Defence Industry Europe 2024b; Militarnyi 2024a).

In September 2024, the French-German company KNDS (2024) opened a subsidiary in Kyiv. KNDS Ukraine LLC will, among other objectives, work on Leopard 1 and 2 main battle tanks, the CAESAR artillery gun, the AMX-10 RC, the PzH 2000 armored howitzer, and the Gepard self-propelled anti-aircraft gun tank. KNDS also plans to jointly manufacture 155 mm artillery ammunition in Ukraine and produce spare parts locally. Under the security framework agreement signed by France and Ukraine, French company Thales (2024a) has struck deals with Ukrainian firms to localize the production, maintenance, repair, and overhaul (MRO) of electronic warfare systems, tactical communications, air defense systems and radars, and unmanned aircraft systems. In contrast, Thales Belgium is assisting Kyiv in producing anti-drone systems (Ministry of Strategic Industries of Ukraine 2024).

In May 2024, while signing Part II of a defense and security agreement, Sweden and Ukraine agreed to exchange information on defense R&D and establish a framework for joint projects, including CV-90 vehicles supplied by BAE Systems Hägglunds (Kyiv Post 2023). Similarly, in August 2024, following the Czech Republic and Ukraine's signing of a 10 year security cooperation agreement, Czech arms supplier AKM Group-CZ opened a representative office in Kyiv (President of Ukraine 2024a; Kushnikov 2024). The Czech company plans to localize joint production facilities for weapons, ammunition, and unmanned aerial vehicles (UAVs) in Ukraine, as well as cooperate on testing new weapon systems, including air defense systems, heavy machine guns, and drones, among others (Kushnikov 2024). In the fall of 2024, as Croatia and Ukraine signed their bilateral security agreement, Croatian company DOK-ING, specializing in robotics and autonomous systems, also opened a new office in Kyiv (President of Ukraine 2024b; Defence Industry Europe 2024c). By contrast, Estonian firm Milrem Robotics has already entered into an agreement with UDI to jointly develop next-generation robotic defense systems (Embassy of Estonia 2024).

Both Ukraine and foreign defense companies operate under the assumption that the on-/re-shoring of defense industrial capabilities will not happen overnight but will require a lengthy and gradual process. This process will first involve the transfer of the most urgent and easily localizable capabilities, such as MRO and spare parts production, before progressing to more sophisticated offsets, such as licensed production and joint development.<sup>5</sup>

## Poland

Like its neighbor, Poland temporarily paused offset agreements in the first few months following Russia's invasion of Ukraine to prioritize rapid acquisitions. However, the country soon reverted to – and in fact significantly increased – its compensation requirements, always through G2G purchases. Balancing short-term military preparedness with long-term industrial self-sufficiency, Poland typically accepts the first batches delivered turnkey, while follow-up deliveries involve industrial participation.

For example, in April 2022, Poland purchased 250 US General Dynamics Abrams battle tanks for \$4.75 billion, with neither a tender nor an offset package (Adamowsky 2022b). In August 2022, the Polish Ministry of Defense (MoD) also signed a \$3.4 billion contract for 180 K2 Black Panther tanks from South Korea's Hyundai Rotem, to be delivered turnkey (Shin 2022). However, as part of a broader framework agreement between Warsaw and Seoul signed the previous month, Poland expects to procure an additional 820 Black Panthers with industrial participation, including domestic component production (PL Ministry of National Defence 2022).

In August 2023, Poland selected a variant of the Kia Light Tactical Vehicle to meet its light reconnaissance vehicle requirements (VPK 2023). A Polish consortium – partly composed of the Polish Armament Group (PGZ) and Rosomak – will manufacture the vehicle under licensed production in Siemianowice Śląskie, through a \$290 million contract. The first batch of vehicles will be delivered fully assembled from Kia Corporation's production line and undergo improvements and finalization at Rosomak's plant. In the second phase, Rosomak will conduct assembly using pre-prepared kits, before transitioning to licensed production with partial localization.

Most recently, in September 2024, another South Korean company, Hanwha Aerospace, agreed to transfer technology to the Polish WB Group (2024) to localize MRO capabilities for submarines, should Poland select its KSS-III submarines for the country's Orka tender. One month later, Hanwha and WB Group also agreed to build a new rocket ammunition factory in Poland (NFP 2024). The facility will produce CCGR-080 missiles used by Hanwha's K239 Chunmoo multiple-launch rocket systems, which Poland has purchased in batches since 2022 and mounted on Polish Jelcz chassis (NFP (2024); PL Ministry of National Defence 2022). Such industrial cooperation 'at subsequent stages' is intended to enhance the capabilities of the Polish defense industry and, thus, the country's self-sufficiency (PL Ministry of National Defence 2022).

Industrial cooperation requirements are not limited to South Korean companies. In June 2022, Poland selected Leonardo's AW149 helicopters for the Perkoz requirement (Leonardo 2024). As part of the offset package attached to the \$1.7 billion deal for 32 aircraft across three variants, the Italian company opened a local production line through its Polish subsidiary, PZL-Świdnik (Leonardo 2024). Similarly, in August 2023, following the previous year's deal for three frigates, UK-based Babcock granted a design license to PGZ and agreed to launch a joint venture to 'establish sovereign capability in Poland' (Babcock International 2024).

Furthermore, in September 2023, Polish Defence Minister Mariusz Błaszczak approved a \$10 billion framework deal to purchase nearly 500 high Mobility Artillery Rocket Systems (HIMARS) from US-based Lockheed Martin (Adamowsky 2023). The project includes the transfer of technology to eventually produce the HIMARS locally. Interestingly, a \$414 million deal for 20 HIMARS concluded in 2019 involved no offsets (Adamowsky 2023).

## Romania

Romania was even quicker than Poland to re-enter offset agreements, focusing especially on autonomy-enhancing capabilities such as MRO. In May 2022, US-based Raytheon partnered with Electromecanica Ploiești to co-manufacture SkyCeptor intercepting missiles in Romania (Chirileasa 2022). While the contract has yet to be finalized, the companies plan to design and construct a new plant (Militaryni 2023). In the initial stage, Electromecanica Ploiești will participate in the assembly of the SkyCeptor, with components supplied from the United States and Israel. Later that year, Bucharest purchased seven Watchkeeper X tactical UAVs from Israeli firm Elbit Systems, with in-country component production, assembly, and MRO (Adamowsky 2022c). Elbit Systems was required to partner with 'domestic economic operators' to deliver the drones. As a result, Elbit Systems (2023) partnered with Romarm to establish an Artillery Centre of Excellence, which now produces 155 mm ATMOS advanced mobile howitzers. Also, in 2022, Rheinmetall (2024c) partnered with Romania's Automecanica Mediaș to operate a local MRO facility for military vehicles. In February 2024, Rheinmetall (2024c) acquired a 72.5% majority stake in Automecanica Mediaș, now known as Rheinmetall Automecanica SRL, effectively integrating it into its global production network.

Romania's offsets are increasingly channeled through G2G procurement and strategic partnerships with supplier nations. For example, in April 2024, Romania and South Korea signed their first defense cooperation agreement, also covering the defense industry (ROK Ministry of Foreign Affairs 2024). In the following month, Hanwha Aerospace entered into an agreement with Romania's National Institute for Aerospace Research for weapons systems R&D and announced plans to offer its AS21 Redback Infantry Fighting Vehicle for Romania's procurement programs (Butterworth 2024; Felstead 2024). In July 2024, Romania selected Hanwha (2024) for 54 K9 self-propelled howitzers and 36 K10 ammunition resupply vehicles, totaling approximately \$1 billion. The deal includes local production, technology transfer, and in-country MRO. By contrast, in September 2024, the US granted Romania a \$920 million loan through Foreign Military Financing (FMF) to support Romania's military modernization and ammunition production (U.S. Embassy in Romania 2024). Part of the loan will be used to establish a large-caliber ammunition (120–155 mm) production center (Mihai Catalina 2024). Romania is reportedly seeking an additional \$2 billion in financing for strategic projects already under consideration (Mihai Catalina 2024). Minister of Economy Ștefan-Radu Oprea hopes the center will make Romania the only producer of Abrams tank ammunition in Europe, capable of exporting overseas (Mihai Catalina 2024).

Furthermore, in November 2024, the Romanian government confirmed its decision to purchase 48 F-35 Lightning II Joint Strike Fighter aircraft from Lockheed (2024b). The \$7.2 billion purchase will be the most expensive in Romanian history (Necsutu 2023). Offsets have not yet been confirmed, but negotiations are planned (U.S. Defense Security Cooperation Agency 2024). Finally, it is worth noting that although a 2017 Foreign Military Sales (FMS) deal for 54 HIMARS to Romania did not involve offsets (U.S. Defense Security Cooperation Agency 2017), in May 2024 Lockheed Martin (Lockheed 2024a) partnered with Romanian Aerostar to open Europe's first HIMARS maintenance center in Bacau.

## Czech Republic and Slovakia

Part of Czechoslovakia until 1992, the Czech Republic and Slovakia maintained a partially integrated defense industry, as evidenced by the CzechoSlovak Group (CSG), a conglomerate encompassing both Czech and Slovak defense companies (CSG 2025). Plagued by relatively limited budgets, Prague and Bratislava also pursued joint procurement projects to leverage economies of scale and reduce costs, though with little success (Chovancik and Oldrich 2023). The new reality of an arms seller's market placed further pressure on both governments to intensify joint procurement initiatives and forego offsets. In August 2022, consistent with conventional theories, the Czech Republic and Slovakia signed an MoU for the joint procurement of CV90 armored combat vehicles from BAE

Systems Hägglunds (Ministry of Defence of the Slovak Republic 2022). However, the two countries ultimately opted for independent purchases, each demanding offsets to benefit their respective domestic defense industries. In December 2022, as part of a government-to-government agreement between Sweden and Slovakia, the Slovak MoD signed a contract to purchase 223 vehicles (BAE Systems 2022). In January 2023, ‘dozens’ of unnamed Slovak companies were selected to manufacture components for the turrets, smoke grenade launchers, and simulators, as well as to integrate weapon systems and power packs locally (Camargos Pereira 2023). In May 2023, the Czech Republic signed a \$920 million contract with Sweden for the purchase of 246 CV90s, with industrial participation (BAE Systems 2023).

In August 2022, Slovakia also finalized a G2G contract with Finland for Patria’s mechanized infantry vehicle, the AMV XP 8 × 8. Although the tender was launched in 2020, Patria (2022) was selected in March 2022, largely due to its local participation package. Patria’s executives acknowledged that the invasion of Ukraine created time pressures but insisted that Slovakia would still benefit from industrial advantages (Loewenson 2022). Similarly, in late 2023, the Czech Republic signed a \$120 million contract for 48 long-range, air-to-air Derby missiles from Israel’s Rafael Advanced Defence Systems, with industrial participation (Gosselin-Malo 2023). According to the Ministry of Defense, Czech companies would contribute to the provision of missile containers, integrated logistical support, and information systems (Gosselin-Malo 2023). The first components of the SPYDER systems arrived at the Military Technical Institute in the Czech Republic in July 2024. This, together with CGS subsidiary RETIA, will reportedly produce 30% of the system (Arkin 2024).

Furthermore, in January 2024, as part of a G2G agreement between Prague and Washington, the Czech Republic finalized a \$6.7 billion deal with Lockheed Martin for 24 F-35 fighter aircraft (CZ Ministry of Defence and Armed Forces (2024); Lockheed 2024c). After a year and a half of industrial cooperation negotiations, Lockheed Martin agreed to 11 offset projects, and Pratt & Whitney agreed to three (Adamowsky 2022a; U.S. Embassy in the Czech Republic (2024); CZ Ministry of Defence and Armed Forces 2024). Thirteen Czech companies and universities will be involved in the manufacturing of components, R&D, pilot training, and MRO services. One of only two certified F-35 pilot training centers in Europe will also be located in the Czech Republic. According to Lockheed, the collaboration with Czech industry is expected to generate economic opportunities and technological advancements for the next 40 to 50 years (Lockheed 2024c).

## Hungary

Like its neighbors, Hungary has also continued to demand defense offsets while navigating the new seller’s market. In line with its traditional policy, Budapest has justified these offset demands as a means of achieving both self-sufficiency and economic development. As a result, Hungary has made numerous requests for export promotion and buy-back arrangements – offsets in which the exporter accepts, as full or partial repayment, products derived from the original exported product. However, Hungary has prioritized localization and the security of supply, postponing export benefits until the needs of its armed forces are addressed.<sup>6</sup>

In December 2022, for example, Rheinmetall (2023c) secured a contract to construct a new ammunition plant in Várpalota, to be built and operated by Rheinmetall Hungary Munitions Zrt, a joint venture with Hungarian N7 holding. The first round of ammunition produced will be fitted to the Lynx IFVs operated by the Hungarian Defence Forces. Subsequent production will be directed towards Rheinmetall’s sales overseas. Once completed and taken over by the Hungarian state, Rheinmetall will become the primary customer for the explosives produced at the plant. In January 2024, Rheinmetall (2024b) began the second phase of construction, ‘Várpalota 2.0,’ to expand the plant and employ a total of 200 workers. Rheinmetall (2024b) will also build an additional plant for RDX explosives on the same site.

Similarly, in November 2023, the Italian Beretta Group and N7 holding agreed to expand a small-caliber ammunition plant in Budapest (Hungary Today 2023). The production will focus on two new

types of ammunition (7.62 mm and 12.7 mm) for the Lynx and Turkish Gidr n combat vehicles, both of which are also produced in Hungary (Hungary Today 2023). Defence Minister Szalay-Bobrovniczky stated that domestic production would enhance ‘security of supply’ and ‘position [Hungary] for long-term export production, thus strengthening the Hungarian economy’ (Hungary Today 2023). More recently, in February 2024, the Hungarian MoD ordered four Gripen fighter aircraft from the Swedish company Saab, also signing an MoU regarding ‘development of high-tech industrial areas and fighter aircraft capabilities’ in Hungary (Saab 2024).

## **Bulgaria**

In Bulgaria, the focus is firmly on self-sufficiency. Sofia has particularly emphasized this through US FMS. For example, in late 2022, while ordering a second batch of eight F-16 jets, Bulgaria requested that Lockheed Martin guarantee industrial cooperation, establish in-country MRO capabilities, and collaborate on UAV technology (K. Nikolov 2022). In the summer of 2024, Bulgaria began providing MRO services for the F-16 at the Avionams aircraft repair plant, which had previously only serviced Russian equipment (Petrov 2024a). The plant now maintains aircraft hydraulics and repairs five major components of the F-16s (Petrov 2024a). ‘The primary objective of such collaboration is to gain knowledge and technical expertise in repairing various types of equipment,’ said Bogdan Bogdanov, then-Minister of Economy and Industry, during a Defence Commission meeting in January 2024 (B. Nikolov 2024).

Similarly, in November 2023, Bulgaria purchased 183 U.S.-made Stryker combat vehicles from General Dynamics under the FMS program for \$1.5 billion (Reuters 2023). General Dynamics proposed establishing a local maintenance hub in partnership with Terem-Holding to support all Stryker fleets in Europe (Reuters 2023). Bulgaria’s Terem-Holding will handle the installation of subsystems, including radios, weapons, and night vision devices (Petrov 2024b). Additionally, General Dynamics has transferred technical documentation to facilitate the production of spare parts in the medium term.

In 2023, Bulgaria also allocated \$220 million to replace Soviet-era radar systems with seven new 3D radars (Army Recognition 2023). According to Colonel Dimitar Georgiev, Chief of Staff of the Bulgarian Air Force, industrial participation will be a key criterion in bid proposals, alongside pricing, operational capability, combat effectiveness, and warranty maintenance (Army Recognition 2023).

## **Baltics**

As the smallest of all CEE countries, Lithuania, Latvia, and Estonia are also the least focused on offsets. On the one hand, their virtually non-existent defense industrial base limits opportunities for offset investments (Hurt et al. 2023). On the other hand, the Baltic states have long been cautious not to challenge the European Commission’s regulations.

For instance, in 2016, Lithuania purchased 88 Boxer IFVs from the German-Dutch consortium ARTEC under a \$412 million contract that included no offset clause (Palavenis 2021). The government later began negotiations for more than 120 additional IFVs, again without offset requirements, despite local media criticism for potentially foregoing millions in benefits to local businesses. Local outlets urged the government to demand industrial participation and compared Lithuania’s decision unfavorably to Poland’s use of offsets (Palavenis 2021). However, representatives from the Ministry of National Defence (MND) explained that including such provisions in the deal would violate EU law.

And yet, instead of continuing on their previous trajectory, Lithuania has begun to change course at an unexpected moment. In January 2024, fully immersed in the new seller’s market, Vilnius negotiated offsets as part of a \$139 million agreement with the Dutch procurement agency COMMIT to acquire Thales Ground Master 200 Multi-Mission Compact radars through a government-to-government deal (Thales 2024b). Lithuanian IT company Elsis will contribute to vehicle integration for the radars.

Later that year, Rheinmetall (2024a) announced plans to invest \$193 million to establish a 155 mm munitions plant in Lithuania and integrate the local industry into the company's supply chain. Rheinmetall's offset investment is driven not by Lithuania's financial capacity or workforce skills, but by its strategic proximity to Ukraine. In 2022, Rheinmetall and Krauss-Maffei Wegmann had already established Lithuania Defence Services (LDS), a Lithuania-based German company, to repair German-made main battle tanks damaged during the invasion of Ukraine (Jakučionis 2023).

In contrast, Vilnius views its enhanced strategic importance as an opportunity to bolster its security of supply. Notably, Lithuania is now demanding local MRO capabilities for its latest order of Boxer IFVs, announced in January 2024 (Fiorenza 2024). However, Lithuania's top priority is localizing the production of combat drones (Vaišvilaitė-Braziulienė 2024). The country is also engaging with Ukrainian and Israeli manufacturers to co-develop new platforms domestically. Additionally, Lithuania has shown renewed interest in localizing the production of munitions, including firearms, grenades, mines, and artillery ammunition.

### Theorizing offsets in supply-driven markets

This non-exhaustive list of offsets in Central and Eastern European states between 2022 and 2024 clearly demonstrates the persistence – and possibly the increase – of defense offsets in supply-driven markets. The evidence gathered here strongly suggests that three main factors drive and make offsets feasible in otherwise unfavorable market conditions: buyer states' self-sufficiency ambitions; the strategic importance of government-to-government relationships; and, relatedly, the extended timelines for offset implementation. Virtually all CEE states emphasize self-sufficiency to justify demands for industrial cooperation, and all secure offsets through G2G procurement, balancing short-term military preparedness with long-term industrial self-sufficiency.

The remainder of this section synthesizes the evidence into a coherent theoretical framework that extends beyond Central and Eastern Europe, offering the first theory of offsets in supply-driven markets. To achieve this, it examines the key actors involved and the rationales behind their actions, beginning with the demand side – buyer states – before addressing the supply side, including foreign defense companies and their home governments.

### *Why states demand offsets in an arms seller's market*

In an arms seller's market, procuring governments face urgent requirements for weapons that are in short supply. As a result, they lack the bargaining power to extract additional technological and industrial benefits from foreign suppliers and have little appetite for lengthy offset negotiations. Not surprisingly, and in line with buyer-driven theories, most Central and Eastern European states paused offset arrangements in the initial months following Russia's invasion of Ukraine, opting instead for readily available and combat-proven weapons systems. However, two factors counterbalance this trend and keep offsets appealing.

First, a deteriorating strategic environment increases the value buyer states place on a strong domestic DTIB and shorter supply chains. Second, buyer states (still) need to justify significantly higher defense spending. While growing threat perceptions enable larger military budgets (Béraud-Sudreau and Giegerich 2018; Walsh, Isomitdinov, and Lee 2024), reallocating resources from other sectors to fund military acquisitions remains politically costly (Moravcsik 1991), particularly for countries with limited budgets like those in Central and Eastern Europe. This explains the copious requests for localization, including the transfer of MRO capabilities, technology, know-how, and export promotion from CEE states over 2022-2024.<sup>7</sup>

Importantly, however, in an arms seller's market, security concerns take precedence over economics. CEE states prioritized the rapid delivery of weapons and later focused on localizing defense manufacturing, postponing economic benefits such as arms exports.

### ***Why foreign suppliers agree to offsets in an arms seller's market***

On the contrary, in an arms seller's market, defense primes find themselves with ample demand and little urgency to secure additional sales. This strong bargaining position enables them to reject offset demands when they see fit. As wealth-maximizing organizations with a medium- to long-term perspective (Brooks 2005; Dunning and Lunding 2008, 7; Waltz 1979, 151), they may still use offsets to access large and growing markets like Ukraine or Poland. However, they have little incentive to extend such arrangements to smaller buyers.

Either way, home governments become fundamental in overcoming security concerns and uncertainty. Beyond supporting their national champions in export competition, as seen in buyer's markets, they intervene to resolve 'market failures.' By committing to long-term security agreements, governments incentivize domestic companies to engage in offsets and reassure buyer states by guaranteeing the phased implementation of offset investments.

To paraphrase Jonathan Tucker (1991), defense majors, anticipating repeated interactions and future sales, tend to discount offset investments over time. Conversely, this expectation also reassures procuring states that they will ultimately recoup the benefits of offsets.

In turn, home governments leverage offsets to strengthen strategic partnerships with buyer states, enhance clients' industrial capacity, and streamline logistics, thereby increasing interoperability with allies, military preparedness, power projection, and deterrence. While quoting U.S. Deputy Assistant Secretary of Defense James R. Blaker, Hammond (1992, 209) noted that in the 1960s, the United States leveraged offsets to bolster the industrial capabilities of its allies. In contrast, U.S. Lieutenant Colonel Petty (1999, 22) observed that offsets can enhance interoperability between the United States and its allies, with the former benefiting from 'foreign-owned manufacture and repair facilities.'

Today, this strategy is most evident in Ukraine – the front line against Russian aggression – where Western suppliers have transferred MRO capabilities and segments of defense production to enhance Kyiv's warfighting effectiveness while preserving their own arms stockpiles. Similarly, across Central and Eastern Europe – a de facto strategic rear – offsets support suppliers' political and military objectives. Even if the Russo-Ukrainian war were to end abruptly, NATO's eastern flank is likely to remain unstable for the foreseeable future, potentially risking direct confrontation between Russia and NATO allies. Offsets could play a key role in bolstering NATO's forward deterrence and preparing for scenarios where deterrence might fail. The establishment of manufacturing and repair hubs in Poland, Romania, Hungary, Bulgaria, or Lithuania by American and German suppliers aligns with these strategic goals.

In sum, contrary to conventional theories, offsets remain appealing and viable even in an arms seller's market. Buyer states demand offsets not merely to compensate for the cost of foreign purchases but to enhance their self-sufficiency. Likewise, defense companies agree to offsets not because of buyers' bargaining power, but because they can spread investment obligations over extended timelines. Home governments play a pivotal role in creating the conditions for offsets to thrive. By committing to long-term security agreements, they incentivize domestic companies to cooperate and provide buyer states with the guarantees needed to accept deferred offset investments.

### **Conclusions and implications**

Conventional theories describe offsets as a product of a buyer's market, where arms supply exceeds demand, granting buyer states the bargaining power to extract additional benefits from foreign suppliers. Recently, however, the global arms trade has shifted to a seller's market, where demand outstrips supply. On one hand, major crises in Europe, the Middle East, and Asia have driven demand for weapons to unprecedented levels. On the other hand, arms supplies have fallen short due to constrained defense supply chains and the inability of major manufacturers to quickly adapt to

wartime production. Under this new seller's market, buyer-driven theories predict that offsets would decrease and eventually disappear, as arms purchasers face reduced leverage vis-à-vis OEMs and diminished appetite for lengthy offset negotiations, particularly in regions with urgent requirements such as Central and Eastern Europe. Yet, CEE states have continued prioritizing offsets, posing a theoretical puzzle.

To explain the resilience of offsets in supply-driven markets, this paper has adopted an inductive research design, analyzing recent offset experiences in Central and Eastern Europe to develop a theoretical framework centered on three key factors: buyer states' drive for self-sufficiency, the strategic importance of government-to-government relationships, and the extended timelines for offset implementation. Despite increased pressure for rapid military acquisitions and reduced bargaining leverage, buyer states' heightened focus on self-sufficiency keeps offsets attractive. Through offsets like localization of defense production, technology transfer, know-how sharing, and MRO capabilities, buyers aim to strengthen their industrial capacity and shorten military supply chains. These ambitions align with the strategic objectives of OEMs' home governments, such as forward deterrence and military preparedness, making offsets viable within G2G procurement frameworks. Indeed, long-term government security commitments incentivize OEMs to engage in offsets while simultaneously reassuring buyer states of their successful, albeit phased, implementation.

By formulating the first theory of defense offsets in supply-driven markets and systematically analyzing recent offset experiences in CEE states, this paper contributes to the small but growing body of literature on the offset phenomenon, both empirically and theoretically. Specifically, it challenges dominant buyer-driven theories while enhancing the theoretical depth of contributions that recognize the potential of offsets to serve strategic objectives.

Additionally, this paper contributes to international relations (IR) and security studies debates on arms collaboration, particularly those focused on the agency of firms and governments (Bitzinger 1994; Calcara 2020; DeVore 2015; DeVore and Weiss 2014; Krotz 2011; Moravcsik et al. 1993). Due to limited data, these studies have thus far struggled to fully open the black box of state-industry relations (Calcara 2020), hindering theoretical advancements. By utilizing the offset backdoor, this paper demonstrates that governments play a leading role in shaping cooperation within a seller's arms market. This aligns with recent work proposing a 'domain of application' approach to explain the primacy of either firms or governments in arms collaboration. While emphasizing 'high-end and low-end arming' domains, Anicetti and Krotz (2024) suggest that arms collaboration under the exigencies of warfare is likely to differ significantly from cooperation during peacetime, compelling governments to take center stage even in areas typically dominated by defense companies.

Future research could test the explanatory power of this model with new empirical evidence or refine it further by identifying its scope conditions. A particularly fruitful avenue would involve analyzing arms trade dynamics in other regions, especially through comparative studies. For example, how do strategically complex environments like the Middle East and East Asia compare to relatively stable ones such as Latin America? Do the deeper financial resources of Gulf countries influence supply-driven dynamics? How do the advanced capabilities of East Asian nations, such as South Korea and Japan, factor into these dynamics? If so, in what ways and to what extent? These are just some of the questions researchers could explore.

## Notes

1. This choice is widely accepted by social scientists when engaging in theory-building. See, for instance (George and Bennett 2005).
2. By 2014, all EU member states had implemented the EU Defense Directive. See (Matthews and Anicetti 2021), 53.
3. See, for instance (Ukrinform 2021).

4. Notably, in January 2025, the United Kingdom (UK) signed a landmark 100-year partnership with Ukraine, reaffirming its unwavering commitment to Ukraine's long-term security and stability. See (UK Gov 2025).
5. See, for instance (CZ Defence 2022).
6. See, for instance, Hungary Today 2023.
7. It is worth noting that states, particularly small ones, appreciate arms export for both economic and security reasons. For example, Lithuania values export for generating income and ameliorating trade balance, as much as a scale economies multiplier and thus a conduit for a viable and vibrant defence industry. 'By concentrating on export and new technologies, the Lithuanian defence industry would strengthen the economy and enhance defence technology competencies, thus furthering the prosperity and security of Lithuania,' stated Minister of National Defence Arvydas Anušauskas in April 2023. See (LT Ministry of National Defence 2023).

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