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# South Korea's Emergence as a Defense Industrial Powerhouse

Wooyeal PAIK

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# Abstract

In recent years, South Korea's ascent in the global arms market has been remarkable. Its arms sales skyrocketed to 17.3 billion USD in 2022. This surge, particularly amid a shifting geopolitical landscape and the ongoing Ukraine-Russia War, has captured the attention of security watchers worldwide.

This paper delves into the intricacies of the South Korean defense industry's rapid emergence and provides an in-depth analysis of its portfolio, capacity, and the rationales guiding its development over the last five decades. It explores how South Korea has capitalized on critical opportunities, including overcoming steep barriers to entry to major contracts with Central and Eastern European countries, especially Poland. It sheds light on South Korea's competitive technologies, mass production capacity, and cost-effectiveness, and addresses the crucial role played by the government's diplomatic support and coordination with key allies and partners. Against that backdrop, it concludes with some implications for the global defense industry and security architecture.

# Résumé

Ces dernières années, la Corée du Sud a fait une percée remarquable sur le marché mondial de l'armement. Ses ventes d'armes ont grimpé en flèche pour atteindre 17,3 milliards de dollars en 2022. Cette montée en puissance, au milieu d'un paysage géopolitique fluctuant marqué notamment par la récente guerre en Ukraine, a attiré l'attention des observateurs des questions de sécurité dans le monde entier.

Cette note examine les subtilités de l'émergence rapide de l'industrie de défense sud-coréenne et fournit une analyse approfondie de son offre, de ses capacités, et des ressorts de son développement au cours des cinq dernières décennies. Elle explore la manière dont la Corée du Sud a su tirer parti d'opportunités cruciales, notamment en surmontant d'importants obstacles pour obtenir des contrats clés avec des pays d'Europe centrale et orientale, en particulier la Pologne. Cette note met en lumière les technologies compétitives, la capacité de production de masse et la rentabilité de la Corée du Sud, et aborde le rôle crucial joué par le soutien diplomatique du gouvernement et la coordination avec les principaux alliés et partenaires. Dans ce contexte, elle conclut en examinant les conséquences que cela implique pour l'industrie de la défense et l'architecture de sécurité au niveau mondial.

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# Introduction

South Korea's arms sales have been skyrocketing. Total exports grew from 3 billion USD in 2012-2021 (annual average) to 17.3 billion USD in 2022. And sales contracts, both completed and negotiated, across the globe are currently accumulating.<sup>1</sup> The most recent deal (December 2023) is a contract to supply Australia 129 Redback infantry fighting vehicles (IFVs) worth 2.4 billion USD.

The international arms trade or defense industrial market is notoriously conservative and dominated by an oligopoly of a handful of countries. This is because the defense industry, often dubbed the war industry, is extremely complex due to the very high level of technology, the large scale of contracts and finance, and the intense interplay with political factors, which has been particularly acute in recent years.<sup>2</sup> The top echelon—the United States (39%), Russia (19%), France (11%), China (4.6%), Germany (4.5%), Italy (3.1%), United Kingdom (2.9%)—accounted for more than 80% of the global arms market in the period 2017 to 2021.<sup>3</sup> In this context, the rapid emergence of South Korea as the eighth-ranking country in the past few years has taken the security watchers by surprise.

The defense industry provides domestic and foreign governments with military capabilities across the ground, as well as naval and aerospace domains, to support current and future military requirements for dealing with hostile entities. Defense industrial enterprises are one of the key strategic partners of governments (and often owned by the latter) in military operations within and outside their sovereign territory. Even though every legitimate country needs national defense, most countries cannot possess a national defense industry. The defense industry is very difficult to cultivate and maintain because it goes beyond the capacities of individual companies and demands a national-level capacity as well as

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1. K. Hosokawa, "South Korea's Hanwha Wins \$3.4bn-plus Australia Defense Contract", *Nikkei Asia*, August 1, 2023, available at: <https://asia.nikkei.com>; J. Chung, "Korea's Defense Industry, on a Growth Track, Rises in Global Sales Rankings" [Sungjangguedo ollatan han bangsan, global maechul Sunwido gungchung], *Chosun Ilbo*, August 10, 2023, available at: <https://biz.chosun.com>; J. Bogaiski, "South Korea Quietly Becomes One of the World's Biggest Weapons Suppliers", *Forbes*, November 7, 2022, available at: [www.forbes.com](http://www.forbes.com).

2. J. S. Gansler, *Defense Industry*, Boston: MIT Press, 1982; R. A. Bitzinger, *The Modern Defense Industry: Political, Economic, and Technological Issues*, Santa Barbara: Praeger Security International, 2009; J. S. Gansler, *Democracy's Arsenal: Creating 21st Century's Defense Industry*, Boston: MIT Press, 2011; N. Ball and M. Leitenberg (eds.), *The Structure of the Defense Industry: An International Survey*, London: Routledge, 2021.

3. "SIPRI Military Expenditure Database", SIPRI, 2022, available at: [www.sipri.org](http://www.sipri.org); Korea Research Institute for Defense Technology, Planning, and Advancement, *Yearbook of Global Defense Industrial Market 2022*, Sejong: KRIT, 2022.

commitment. No country buys a company's weapons but those of a country A's company. This means that country A should be able to manage high capital intensity, long R&D cycles, and large-scale economies. It must sustain some serious inefficiency, low profitability, and business uncertainty to acquire and maintain its "independent" weapons production capacity. Such a structure forces governments to provide heavy subsidies and strong protection via policy tools such as exclusive procurement procedures and offset trade clauses, which separate this industry from other open and liberal market-oriented industries.

Accordingly, any newcomer faces a steep barrier to entering this global oligopoly, not to mention that it must take care of its domestic market vis-à-vis foreign arms providers.<sup>4</sup> The rise of South Korea, a newcomer to global strategic leadership, has taken many by surprise, including in Europe; it has provided the countries with a critical opportunity to climb the ladder and break the glass ceiling. A series of major contracts and ensuing speedy execution with Central and Eastern European countries (especially Poland) in 2022 and 2023 is a springboard for the South Korean defense industry, particularly for ground and aerospace.<sup>5</sup> It seems ready to take a chance and make a bold, if not reckless, move into the European security theater, with its competitive technologies, mass-production capacity, lower prices and quick delivery times, coordination with its key ally (the US), and the government's full diplomatic supports. South Korea's recent sales are said to have already pushed Seoul into the "defense major league" with the acknowledgment of "a new democracy's arsenal" amid the Ukraine-Russia War and ensuing military build-up in Europe.<sup>6</sup>

Against this backdrop, this policy paper analyzes the key features and background of South Korea's intriguing burst into the global defense market. It looks at the defense industry's portfolio and capacity and reasons for its development over the last five decades, along with its strengths and weaknesses. Finally, it briefly outlines the main security implications of the Korean defense industry's surge, along with a prediction for its short-term future.

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4. Korea's defense industry has been steadily emerging in the global market, even though its sales were too limited for it to be considered a major global powerhouse until 2022 and 2023.

5. W. Paik, "Korean Defense Industry Enters European Security Theater: An Analysis of Korea-Poland Arms Deal", *IRSEM Note*, IRSEM, forthcoming.

6. B. Lendon and G. Bae, "President Yoon Wants South Korea to Become One of World's Top Weapons Suppliers", *CNN*, August 17, 2022.



# South Korea's defense industry: products, industries, and government agencies

## Defense industrial products

South Korea's defense industry produces a wide range of weapons, covering conventional weapons and advanced technology-oriented weapon systems across the ground, naval, aerospace, and electronic equipment fields. The main products are as follows.<sup>7</sup>

Land systems:

- ▀ **Small Arms and Light Weapons:** All types rifles, machine gun, pistol, grenade launcher, labeled 'K1–K16', Hyungung portable anti-tank missile, etc.;
- ▀ **Armored vehicle:** Tracked and wheeled, the K-21 Redback infantry fighting vehicle (IFV), K200 IFV, K808 wheeled armored personnel carrier (APC), etc.;
- ▀ **Main battle tanks:** generation 3.5 K-2 Black Panther, generation 3 K1A1;
- ▀ **Artillery:** K-9 self-propelled howitzer, K-10 ammunition resupply vehicle, K105A1 self-propelled wheeled howitzer, K-239 Chunmoo MLRS;
- ▀ **Ammunition:** All types from 5.56 mm small-arms ammunition and new special-purpose ammunition to 155 mm howitzer shell;
- ▀ Various unmanned vehicle.

Naval systems:

- ▀ **Surface combatant vessels:** All types from Dokdo-class transport ship, King Sejong-class destroyer, Cheonwangbong-class landing ship, and Tide-class combat support ship to aircraft carrier (being developed);

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7. For more details, refer to S. Oh and S. Ahn, *ROK Military Weapons Systems 2020-2021*, Hangukgun Mugiyeongam, 2020-2021; *Defense Times*, 2022; and the following websites of the key weapons producers: Hanhwa Aerospace ([www.hanwhaaerospace.co.kr](http://www.hanwhaaerospace.co.kr)), Korean Aerospace Industries ([www.koreaero.com](http://www.koreaero.com)), Hyundai Rotem ([www.hyundai-rotem.co.kr](http://www.hyundai-rotem.co.kr)), LIGNex1 ([www.lignex1.com](http://www.lignex1.com)), Hyundai Heavy Industry ([www.hhi.co.kr](http://www.hhi.co.kr)), and Poongsan Co. ([www.poongsan.co.kr](http://www.poongsan.co.kr)).

- ▀ **Submarine:** Diesel-electric-engined Jangbogo-class (SS-I), Sonwonil-class (SS-II), Dosan Ahnchangho-class (SS-III) Submarine;
- ▀ **Weapons systems:** torpedoes, sonar systems, and more.

Air and space systems:

- ▀ **Combat aircraft:** T-50 Advanced jet trainer, FA-50 Light jet fighter, KF-21 4.5 Generation jet fighter;
- ▀ **Multi-purpose satellites:** Compact advanced satellite 500, Geostationary Korea multi-purpose satellite, Korea multi-purpose satellites;
- ▀ **Space launchers:** Liquid-fueled, solid-fueled and mixed-fueled launch vehicles;
- ▀ **Ballistic missiles:** Chungung M-SAM Block-II, Hyunmu-3 Cruise missile, Hyunmu-4 ballistic missile, Hynmu-5 ballistic missile (IRBM), L-SAM (being developed), Low-altitude missile defense LAMD (being developed);
- ▀ Shingung portable surface-to-air missile, AESA radar systems, helicopter, unmanned jet fighter, and more.

## Mapping of defense industries and government agencies

Six companies mostly produce these weapons—Hanhwa Aerospace (army, navy, aerospace), Korean Aerospace Industries (aerospace), Hyundai Rotem (land), LIG Nex1 (missile, aerospace), Hyundai Heavy Industry (navy), and Poongsan (ammunition)—along with dozens of small and medium-sized companies.

South Korea's defense industry is based on a joint-venture model between government agencies and private companies. Initial demand for a particular weapon or weapons system comes mostly from the armed forces and government (often labeled as a “requirement institution”). After the government completes the conceptualization, design, experimentation, and testing of a weapon system, private defense companies undertake mass production to provide complete products for the armed forces and support aftersales maintenance for decades. Even though private producers' R&D has been growing in recent years, this public-private partnership or division of labor is a unique feature of the South Korean defense industry's painstaking development over the last five decades. It can be categorized as a so-called “developmental state” strategy for developing East Asian countries but is

much more state-led than for other industries.<sup>8</sup> The government carries out industrial development planning, financing, and R&D, while private contractors receive constant technology transfers and guaranteed profits from the government.

In detail, the Ministry of National Defense and its affiliated agency, the Defense Acquisition Program Administration (DAPA), consider the requirement institutions for each field troop of ground, navy, and air force and start a series of R&D procedures via the government-affiliated research institute, the Agency for Defense Development (ADD). In general, defense industries cannot be solely private and independent from government command and control; rather, they mostly depend on the market creation and maintenance of national armed forces. Nevertheless, the degree of collaboration, cooperation and amalgamation between public and private actors varies country by country. In the case of South Korea, it is one of the highest among the major countries, though it is hard to measure accurately. As international trade agreements such as GATT and the WTO clearly allow for “security exceptions”,<sup>9</sup> the defense industry is not subject to general liberal market-bound trade agreements. South Korea, one of the world’s largest free-trade economies, has long taken full advantage of this exception principle to promote its defense industry. Without such persistent will and effort, it had no chance of producing and even exporting a wide range of conventional and cutting-edge weapons in the 2020s.

Three government agencies have been key to this government-propelled development over the last five decades.

First, the national research institute, the Agency for Defense Development (ADD), launched in 1970, has been an engine of South Korea’s defense industrial development. Its primary goal is to “contribute to the reinforcement of national defense power and the accomplishment of self-reliance of national defense by taking charge of the technical survey, research, development, and testing of weapons, equipment, and supplies required for national defense, as well as the survey, research, and testing of science and technology related to it”.<sup>10</sup> This non-profit R&D institute oversees the source technology development of most Korean-made weapons

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8. P. Evans, *Embedded Autonomy: States and Industrial Transformation*, Princeton: Princeton University Press, 1995.

9. “Nothing in this Agreement shall be construed (a) to require any contracting party to furnish any information the disclosure of which it considers contrary to its essential security interests; or (b) to prevent any contracting party from taking any action which it considers necessary for the protection of its essential security interests (i) relating to fissionable materials or the materials from which they are derived; (ii) relating to the traffic in arms, ammunition and implements of war and to such traffic in other goods and materials as is carried on directly or indirectly for the purpose of supplying a military establishment; (iii) taken in time of war or other emergency in international relations; or (c) to prevent any contracting party from taking any action in pursuance of its obligations under the United Nations Charter for the maintenance of international peace and security.” GATT Article XXI ([www.wto.org](http://www.wto.org)).

10. “Article 1 of the Act on the Agency for Defense Development”, available at: [www.add.re.kr](http://www.add.re.kr).

across various fields. South Korean weapons development starts with a government-commissioned R&D project, which is carried out by ADD rather than private companies, which are thus spared enormous R&D expenses and have more financial flexibility to compete in and out of the Korean market. In the past few years, however, private companies have sought to take over some R&D functions to advance their own technological advancement.

Secondly, established in 2006, the Defense Acquisition Program Administration (DAPA) is a centralized administrative unit for specialized weapons procurement. It oversees improvement in the nation's defense capabilities, providing military supplies and fostering the defense industry in the domestic and international markets.<sup>11</sup> This government branch under the Ministry of National Defense plays an intermediary and overseer functions in the South Korean defense industry. Representing the initial requirement institutions (Ministry of National Defense, Joint Chiefs of Staff, Army, Navy, Air Force, and Marines), DAPA manages most weapons procurement, whether produced domestically or imported, as well as the export of Korean weapons, alongside the mass-producing private defense companies. DAPA has become a single point of contact for the Korean government. Most international weapons trade, whether imports or exports, goes through national governments. DAPA plays multiple roles in this regard and takes the lead in arms exports. It is also in charge of offset trade, another critical and sensitive dimension for international arms deals.<sup>12</sup>

Thirdly, as in other major arms-exporting countries, the government provides financial services for its arms sellers. In international arms deals, especially when the importer is a developing country, the exporting country's financing is indispensable; this has become an established part of the international defense market system. Aside from the US, an outlier, the other major countries follow this high-risk, high-return business to promote, protect and preserve their defense companies and, ultimately, the defense industrial eco-system. South Korea's Export Credit Agency (ECA) system covers this daunting task. In many cases, the Korea Trade Insurance Operation (KTIO) guarantees against the risk involved in loans that often amount to multi-billion US dollars.<sup>13</sup> In most large deals, Korea Eximbank takes responsibility for directly financing or lending a large portion of the purchase amount.<sup>14</sup> Throughout the lifecycle of defense industrial production, the South Korean government leads the way.

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11. "About DAPA", available at: [www.dapa.go.kr](http://www.dapa.go.kr).

12. Offset trade refers to commercial and/or industrial compensation practices as a condition of weapon purchase, including technology transfer, licensed production, sub-contractor production, co-production, and other related investment.

13. For details of KTIO, refer to its website, available at: [www.ksure.or.kr](http://www.ksure.or.kr).

14. For details of Korea Eximbank, refer to its website, available at: [www.koreaexim.go.kr](http://www.koreaexim.go.kr).

These government agencies, among others, are tightly connected to the aforementioned manufacturers. These companies are private entities, clearly independent from the government in market status, even though they cannot survive and prosper without a close partnership with these government agencies and each field troop—often all the way up to the Presidential office. The ADD creates and tests source technologies, which demand high-level human resources and cost the most in the weapons development process. At the same time, the linked private companies receive technology transfer and materialize the final products for sale in the domestic and international markets. To be sure, these private companies possess a high level of technology to combine multiple elements and acquire their own R&D capacity while co-developing a growing number of source technologies with ADD. Most of them are home-grown, without any major merging with foreign companies. The six key companies—Hanhwa Aerospace, Korean Aerospace Industries, Hyundai Rotem, LIG Nex1, Hyundai Heavy Industries and Poongsan—have been growing in such public-private partnerships.

Certainly, there was fierce competition among these and other companies, which had since been phased out and merged into these big brands during the ups and downs of the domestic and international markets and major changes in government. These companies started to expand their sales beyond the domestic market in the early 2010s. It was natural for them to put their products into international markets when their quality caught up with that of the top global makers and when they needed to increase their sales to achieve economies of scale, i.e., to reduce the price per unit to be even more competitive for their profit-making and reinvestment in an era of rapid technological advancement, often dubbed the “4<sup>th</sup> industrial revolution” and “technological convergence”. These companies already benefit from government-backed high technology, mass-production capacity, quick delivery time, a generous technology transfer policy, and, most of all, relatively cheaper prices in the global market.

The next section explains how the South Korean defense industry has been able to sustain such a long build-up process since the 1970s to become an emerging force on the global stage.

# Reasons behind South Korean defense industrial development

South Korea was a unique case after World War II. Once a colonized country divided into the two Koreas, it experienced one of the most brutal of modern wars, struggled as one of the world's poorest societies, and survived two suffocating authoritarian dictatorships to become a technologically advanced liberal democracy and economic powerhouse, with an exciting pop culture. Against this backdrop, the South Korean government frequently uses a self-promoting catchphrase, "First country from aid recipient to aid donor".<sup>15</sup> This can also be applied to its defense industry. South Korea's international arms sales have skyrocketed, from 2.35 billion USD in 2012 to 7.25 billion in 2021 and 17.6 billion in 2022. The long development efforts have begun to pay off. But what are the main reasons for the country's defense industrial success? How have the South Korean government and private partners sustained this six-decade process? Among others, we can highlight four elements, three structural and one facilitating: military confrontation with North Korea, international partnership with the US and other major powers, domestic bipartisan political support and diplomacy, and, as a final trigger, the Ukraine-Russia War.

First, North Korea has been a primary reason for the steady development of South Korea's defense industry over recent decades. After the armistice was declared in 1953, the two Koreas have been technically still at war, without a peace treaty, with constant military conflicts from small land and sea skirmishes to substantial military crisis escalation. This has justified their military build-up. In 2022, South Korea's defense budget reached 46.3 billion USD, 2.72% of the entire national GDP. In fact, South Korea's defense spending reached 6.4% in the 1960s, 1970s, and 1980s, gradually falling to a mid-2% level throughout the 1990s, 2000s, and 2010s, as the size of the national economy quickly grew so that it entered the global top 10.<sup>16</sup> The massive defense budget was indispensable to constrain the North Korean military adventurism, aggression and provocation that threatened the very survival of South Korea.

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15. J. Egan and S. Persaud, "From Emerging Donors to Global Development Partner", *OECD 'Korea' Section*, October 25, 2021, available at: [www.oecd.org](http://www.oecd.org).

16. "SIPRI Military Expenditure Database", op. cit.

An interesting deviation of South Korea from other developing countries in a militarily hostile environment across the globe was its relentless investment in and obsession with developing its own weapons system. It had neither viable technology nor production capacity, depending solely on the US's benevolent provision, if not donation, after the Korean War. Nevertheless, the US provision did not fulfill South Korean military needs in either quantity or quality. This propelled the country to establish its own indigenous defense industry. Such an industry requires high capital intensity, long R&D cycles, and large-scale economies, which South Korea could not achieve for at least the first three decades of development. This story sounds very similar to South Korea's other industrial sectors' 'catch-up' development, based on a government-planned industrial development strategy, especially focusing on manufacturing and technology-oriented industries from the 1960s to the 1990s. Such a developmental state could justify such an inefficient and money-losing business because of the hostile presence of the country's potential brother-nemesis, North Korea. South Korea feared, too, that the US might stop providing it with essential as well as more high-tech weapons.

Secondly, South Korea's military ally and security patron, the US, has played a strong role in the defense industry's eventual ability to compete with non-US weapons producers. The US motivated South Korea to establish its own defense industry in both positive and negative ways. A quintessential military ally for South Korea during the Korean War and ever since, the US provided it with numerous weapons; these have become a backbone of South Korean military capacity as well as a starting point for its defense industrial development. Like any other fast follower, South Korea copied the American army, navy and air force equipment, with or without official technology transfers. Military engineers, such as those of ADD and private producers, also learned from their American counterparts, often via license production. However, the US have been reluctant to transfer its core military technologies to South Korea, which is common among the top defense-producing countries. In particular, the US were seriously concerned about the possibility of South Korean military adventurism once it became capable of designing, producing, and maintaining more advanced weapons such as ballistic missiles.<sup>17</sup> South Korea has been (and still is) one of the top buyers of top-notch but expensive American weapons for a long time; therefore, its growing self-production and ability to substitute American weapons is not a good development for the US in commercial terms. As South Korean defense technologies made strong progress, especially in the 1990s and 2000s, the US became more reluctant to transfer technologies. Against this backdrop,

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17. S.-Y. Kim, "Security, Nationalism and the Pursuit of Nuclear Weapons and Missiles: The South Korean Case, 1970-82", *Diplomacy & Statecraft*, 12(4), 2021, pp. 53-80.

South Korea turned more to the other major producing countries such as France, Germany, Russia, and Ukraine.<sup>18</sup>

Thirdly, the South Korean defense industry has enjoyed full bipartisan support from the two largest parties—conservative and progressive—over the last three decades. Before the country's democratization in 1987, the military authoritarian regimes under Park Chung-hee and Chun Doo-hwan fully supported the development of an indigenous defense industry. In particular, the former established the defense industry's fundamental institutes and policies, such as ADD and other government-sponsored programs. Chun Doo-hwan was less active because he was susceptible to American pressure for South Korea not to climb up the ladder in defense technologies and ensuing weapons development due to its lack of political legitimacy. The Chun regime allegedly pulled back on much of the country's high-tech weapons development program to gain political "endorsement" from the US; its coup in 1980 had been strongly rejected by the US. However, during the democratic era, most presidents, whether conservative or progressive, have been proactive, if not aggressive, in promoting the country's defense industries, both within and outside South Korea. In particular, the last four current presidents—Roh Muhyun, Lee Myungbak, Park Geunhye, Moon Jae-in, and Yoon Seokyeol—are enthusiastic about defense industrial development and, especially, about making inroads into the global market. The defense industry is critical for both the South Korean elites and the public in both symbolic and practical perspectives because the country has a long history of being invaded, looted, and eventually colonized, in addition to the everlasting military threats from North Korea. In this context, being a formidable military power, based on its self-produced weapons widely exported to other countries, including even Europe, has become a matter of national pride, which is easily converted into political identity and asset. Neither the two main parties nor their leaders miss this critical point. If the defense industry excels, the ruling party and the president can frame it as a substantial foreign policy achievement.<sup>19</sup>

Fourthly, all its efforts were insufficient for South Korea to enter the global defense market until an international war triggered a structural change in the European defense market: the Ukraine-Russia War, following Russia's invasion in February 2022.<sup>20</sup> South Korea needed Europe as a competitive and collaborative partner in the defense industrial dimension,

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18. S. H. Ahn, "Understanding Russian—South Korean Arms Trade: A Nontraditional Security Approach?", *Armed Forces & Society*, 35(3), 2009, pp. 421-436.

Note that Korea is also the No. 7 arms importer in the world, and its imports have grown considerably. Germany (19%) and France (7.9%) are the 2<sup>nd</sup> and 3<sup>rd</sup> weapons exporters to South Korea behind the US (71%) in the period 2018-2022 (source: "SIPRI Military Expenditure Database", op. cit.).

19. H.-J. Kim, "Yoon Says S. Korea's Defense Industry Is Writing New History", *Yonhap News*, October 14, 2023, available at: <https://en.yna.co.kr>.

20. D. Yoon, "Ukraine War Drives Rapid Growth in South Korea's Arms Exports", *The Wall Street Journal*, February 2, 2023, available at: [www.wsj.com](http://www.wsj.com).



but probably not the other way around until this war broke out. South Korean defense industrial products have been in high demand in European NATO (North Atlantic Treaty Organization) countries, especially those in Central and Eastern Europe. Poland has led the way, having completed a deal with South Korea for at least 13.7 billion US dollars' worth of K2 tanks, K9 155 mm self-propelled howitzers, FA50 light jet fighters, Hyunmu multi-launched rocket systems, and other missiles. Other countries in the region, such as Romania, have also been actively negotiating with Korea on arms supplies.<sup>21</sup> This breakthrough for the South Korean defense industry in NATO territory opens up a large market that looks favorable and, as of now, lacks many competitors.

The US and European NATO countries such as France, Germany and Italy cannot meet the demands of the European arsenal on the eastern frontline. There is no immediate production capacity to suffice within Europe, even though these countries have both technologies and manufacturers. The legacy of a long peace and ensuing weapon redundancy trend in the post-Cold War era greatly reduced their mass-production capacity. The Russian threat to Eastern European countries provoked a series of demands for massive supplies of diverse weapons systems. In July 2023, the NATO allies reportedly agreed to invest at least 2% of their GDP in their militaries in the future.<sup>22</sup> Such an upward military procurement drive will continue for at least the next decade or two. Europe is rearming, and the US-led NATO needs South Korea in this mix. The US have been supporting the Korean defense industry in Europe. As a result, South Korea has found ways to achieve economies of scale so that its defense industry can be even more competitive in the global market.

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21. H.-B. Kim, "Korea Looks to Sell Weapons to Romania Following Lucrative Deal with Poland", *The Korea Times*, February 9, 2023, available at: [www.koreatimes.co.kr](http://www.koreatimes.co.kr).

22. R. Gramer, A. Mackinnon and J. Detsch, "Eastern Europe Wants NATO to Beef Up Defense Spending", *Foreign Policy*, February 2, 2023, available at: <https://foreignpolicy.com>.

# Strengths and weaknesses of South Korea's defense industry

The strengths of South Korea's defense industry are: competitive technology, mass-production capacity, quick delivery time, lower prices, consistent aftersales maintenance, a NATO-standardized system, field-tested materials, and full government support. As explained above, South Korea's defense technologies are more likely to be at a similar level or below those of the other leading countries, excluding the US. Many South Korean conventional weapons, such as main battle tanks, self-propelled howitzers, infantry fighting vehicles, submarines, and light jet fighters, as well as some cutting-edge fields such as ballistic missiles, are competitive, if not the most competitive, in the global market. The government R&D agencies such as ADD provide constant upgrade and support for the final-product manufacturers in the private sector. And the private weapon-makers offer mass-production and quick delivery at surprisingly reasonable prices; this is their most important competitive advantage for riding the global security wave in the early 2020s. Few countries can match South Korea's strength in those listed weapons both now and in the foreseeable future. As latecomers to the market, its arms exporters are more flexible and accommodating to buyers before and after sales. South Korea has been more generous in technology transfer, more responsive to buyers' maintenance-repair-operation (MRO) call, and more willing to localize production.<sup>23</sup> These strengths appeal to customers across the globe, including those in Europe.

Next, the weaknesses of South Korea's defense industry are: competitive but 1.5/2<sup>nd</sup> tier technologies, American and German constraints on exports, overproduction concern, an inadequate export financing system, relatively passive investment by private companies, and a tendency to be carried away by the sudden success of recent years. South Korea is not yet one of the top 4-5 countries in the global defense industry. Most of all, its technologies are neither comprehensive nor fully developed in the most advanced fields. It does not possess key aerospace and naval technologies such as gas-turbine engines for jet fighters, avionics, nuclear-engine submarine, control and command system, synthetic aperture radar (SAR), electro-optic/infrared (EO/IR), and so on. South Korea is still roughly

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23. C. Davies, S. J. Mercedes Ruehl and S. Pfeifer, "South Korea's Defense Industry Rides Global Order Wave", *Financial Times*, November 26, 2023, available at: [www.ft.com](http://www.ft.com).

ranked 8<sup>th</sup>-10<sup>th</sup> in the overall defense technological level.<sup>24</sup> Accordingly, it is constrained by the original source technology provider (i.e., the US) in many critical export businesses. The entire production line stops if the US refuse to provide some key parts for a Korean producer. The deal is broken when the US decide not to permit a Korean company to export a weapon system. At the same time, the arms producers' heavy dependence on government support, which is often regarded as a strength, can be a glaring weakness for the R&D capacity of the private sector. Accordingly, several large companies have started to invest more in R&D and other necessary sectors in order to lead technological advancement, but this, so far, has not been sufficient.

Limited export financing is another weakness for a series of mega export deals. The loan limit of Korea Eximbank is too low to cope with multi-billion-dollar deals, such as that with Poland and other developing countries. Even though both the ruling and opposition parties have sought to increase the loan amount in recent months, domestic political conflicts have been delaying the legislation process. Last but not least, South Korea's defense industry seems to have been carried away by the surprising success of recent years. Even though the future is bright, the companies and their patron, the government, have been overly optimistic, painting a rosy picture for the domestic and international audience. In contrast, in autumn 2023, Seoul became concerned that the change of government in Warsaw, combined with a lack of funds, might jeopardize its multibillion-dollar arms deals with Poland.<sup>25</sup> In brief, with the global security structure in flux, South Korea faces a long uphill battle over the coming decade at least.

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24. Korea Research Institute for Defense Technology, Planning, and Advancement, "Defense Science & Technology Level Assessment by Country (2022)", Jinju, KRIT, 2022.

25. For details, see W. Paik, "Korean Defense Industrial Cooperation in Europe: A First Cut of Poland Case and Beyond" (working paper for IRSEM).

# **Perspective: implications of South Korea's surging defense industry for global defense and security**

The sudden success of South Korea in the global defense market will likely be maintained over the next decade or so, even though it will encounter many obstacles in competing with the other upper-middle powers in the field. A brief analysis of the perceptions of other major countries regarding South Korea follows.

## **South Korea's defense industry is complementary to the U.S.**

First, for South Korea, the US are not a competitor because its level is out of reach for the other top arms providers. South Korea will play a complementary role when the US need it to be involved in the primary battlefields such as Central and Eastern Europe, the Middle East, Southeast Asia, etc. South Korea needs all types of cooperation from the US to continue advancing its technologies, expanding its overseas markets, and improving its interoperability (i.e., NATO standardization). As illustrated above, South Korea needs more support and assistance from the US to enter and consolidate its status in the European defense market. If we consider the political orientation of the international arms market, this formal military ally and patron, the US, is critical for South Korea's defense industrial development.

The US ensure that the defense industry is a tool of its foreign policy, as follows: "Foreign Military Sales (FMS) are a key U.S. arms transfer mechanism and an important tool of U.S. foreign policy. Overseen by the U.S. Department of State and implemented through the U.S. Department of Defense, FMS is one of many ways the United States promotes interoperability and strengthens our unmatched network of alliances and security partnerships worldwide."<sup>26</sup> In this sense, South Korea is at least partly subject to the US foreign policy on arms trade.

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26. US Department of State, "FMS 2023: Retooling Foreign Military Sales for An Age of Strategic Competition", *Fact Sheet*, May 18, 2023.

## The looming North Korea threat

Note that South Korea still needs much more advanced weapons to defend itself from North Korea—and potentially China in the long term. Despite its defense industrial success, its security in East Asia largely depends on the US, while the US need South Korea as part of a strong alliance network in the Indo-Pacific region and beyond. As the Indo-Pacific and Euro-Atlantic regions' security structures are much more intertwined, if not integrated,<sup>27</sup> the bilateral and extended alliance network will be a critical factor when it comes to the South Korean defense industries entering and settling down in NATO territory. In the meantime, in recent months, North Korea started to sell a large amount of ammunition, such as 120 mm and 152 mm howitzer shells, as well as conventional weapons, including missiles, to Russia.<sup>28</sup> The South Korean government has estimated that one million shells have already been delivered to Russian troops on the Ukraine frontline.<sup>29</sup> In return, North Korea allegedly received much-needed high aerospace technologies, which may already have been used for the successful launch of a military satellite last November. This Russian-North Korean arms deal greatly deepens the security connection between East Asia and Central and Eastern Europe, if not integration. The two Koreas have entered the European security theater.

## Contributing to European arms supplies

Next, France and Germany need Korean arms sales in the European security theater now but will likely regard South Korea as a competitor in the coming years.<sup>30</sup> As outlined above, since the Russian invasion of Ukraine in early 2022, South Korea has been filling the arsenal of European NATO countries, especially those in Central and Eastern Europe, which must have immediately improved their army and air force capacity. The Western European powerhouses cannot and will not provide a set of conventional weapons for these NATO countries in the foreseeable future. Therefore, unlike before the Ukraine-Russia war, South Korea is a welcome supplier to that market.

Nevertheless, France, Germany, and the UK are among the most advanced countries in the international defense market. Their technologies across most sectors are more advanced than those of South

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27. For details, see W. Paik, "Korea Looks to Europe: Its Growing Military-Strategic Cooperation with NATO", *IDSP Issue Brief*, IDSP, May 2023.

28. A. Panda, "What Putin and Kim Want from Each Other", *Foreign Policy*, September 15, 2023, available at: <https://foreignpolicy.com>.

29. Y. Seo and S. Tanno, "North Korea Believed to Have Exported over 1 Million Shells to Russia", *CNN*, November 2023, available at: <https://edition.cnn.com>.

30. French Ministry of Europe and Foreign Affairs, "French Foreign Policy: Defence Industries and Technologies", available at: [www.diplomatie.gouv.fr](http://www.diplomatie.gouv.fr).

Korea, and they have longer track records when it comes to appealing to customers. South Korea's R&D spending has risen to the levels of these top European countries in the past few years, but this does not suffice for it to catch up with them, at least in the next decade or so. Even though they cannot produce and deliver their conventional weapons as quickly as South Korea now, they can catch up in the medium term once they decide to do so. The other European producers, such as Sweden, Spain, and Italy, would have a similar approach, to a lesser extent. All the above countries, particularly France, have been gaining a larger share of the defense market, with Russia receding due to its invasion of Ukraine and ensuing fallouts. Before the war, Russia occupied approximately 19% of global arms exports, but its arms sales have been dramatically reduced. It will not make a comeback anytime soon, even though it will eventually do so, albeit with somewhat tarnished credentials. France, which would compete with Russia for the No. 2 spot in the coming years, already competes with South Korea in multiple international biddings. So does Germany.

As regards Russia, it perceives South Korea's increasing weapons exports as a negative, if not hostile, action against itself. The first major deals to put South Korea in a surprising run in Europe happened with Poland, which has provided all types of ground and air force materials. As illustrated above, such a breakthrough allowed South Korea to quickly spread its weapons in Central and Eastern Europe. These countries, which are NATO members, have been replacing Soviet weapons with more NATO-interoperable weapons from the US, France, Germany and, now, South Korea. To be sure, Russia does not expect the Central and Eastern European countries to buy its weapons but should feel very uncomfortable, if not agitated and threatened, by the ongoing military buildup of these post-Soviet countries with advanced NATO-standard conventional weapons from South Korea. Moreover, South Korea's arms sales to these Russian neighbors include an extensive localization package, as the case of Poland shows. In the long term, these Central and Eastern European countries have a high chance of becoming substantial weapon providers for their troops as well as other countries to challenge the Russian influence across Eurasia. Note that these European developing countries have struggled to receive defense technology transfer from their Western NATO allies.

## No head-on competition with China

China has yet responded to South Korea's surge in the global arms market. The two countries do not share any defense industries. Among the most prosperous bilateral trade partners in the global market, the members of this duo keep a distance from each other in the defense industrial sector. They neither export nor import armaments, let alone transfer or exchange technology. In addition, because its domestic demands are overwhelming,

China does not make much effort to sell its weapons to the outside world, except for some small-scale aid-type ones. To be sure, this is all in relative terms, considering China is the world's No. 1 exporting country, and its defense expenditure is the world's second largest, behind the US, its primary military rival.

China does not currently compete with South Korea in the global defense market. Moreover, South Korea's weapons sales to China's neighbors in Southeast and South Asia—the Philippines, Malaysia, Indonesia, Thailand, and India—are growing but quite limited as far as helping these countries to challenge China's military dominance in its core national-interest regions such as the South China Sea and Taiwan Straits. South Korea does not sell weapons to Taiwan, which might want to buy some of its conventional and high-tech weapons such as self-propelled howitzers, main battle tanks submarines, and ballistic and cruise missiles. However, the growing presence of the South Korean defense industry will eventually concern China in both the regional and global security contexts<sup>31</sup> since South Korea is a spoke of the American alliance hub in the Indo-Pacific region. In a similar vein, another Southeast Asian country that experiences territorial and political disputes with China, namely Vietnam, is the next target for the major South Korean makers as Vietnam's Russian-based weapons systems become less sustainable.<sup>32</sup>

## A world of ever-increasing complexity

We can see, therefore, a set of complicated dynamics revolving around the ascent of South Korea's defense industry, both in recent and coming years. South Korea is and will constantly be in an uphill battle to compete with the top dogs in the global war economy. Having transformed from an importer to an exporter, it is a rare case, if not an outlier, in the contemporary global defense market. An unexpected change in the European security environment helped it to quickly emerge as an up-and-coming weapons provider across the globe.

With the complex security interactions during the Russian war against Ukraine, the world entered an era of security convergence of military, economic, technological, and regional (Indo-Pacific and Euro-Atlantic) dimensions. Most of all, the US are trying hard to form a framework to cover the entire globe in a multilateral "integrated deterrence" strategy.<sup>33</sup> First, this grand strategy seems to be directed at

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31. W. Paik, "China's Ambivalence on the North Korea-Russia Security Alignment", *The Diplomat*, November 11, 2023.

32. H. Kang, "South Korea Tries to Fill Vietnam's Security Void after Russia's Invasion of Ukraine", *The Korea Times*, August 4, 2023, available at: [www.koreatimes.co.kr](http://www.koreatimes.co.kr).

33. T. Lopez, "Allies, Partners Central to U.S. Integrated Deterrence Effort," *DOD News*, March 1, 2023, available at: [www.defense.gov](http://www.defense.gov).

convergence between these two key regions. Accordingly, the so-called NATO/Asia-Pacific Four (AP4: Australia, Japan, South Korea, New Zealand) format has started to play a critical role in the military dimension. Moreover, this military dimension is amalgamated with the economic and technological dimensions. Given the recent emergence of concern with economic and technological security across the globe, it is logical to combine multiple conventional (military) and emerging (economic, technological, political, environmental) dimensions. US-China competition in bilateral and expanded formats has been supercharging these security structural changes. Accordingly, South Korea's evolving military relations with NATO as one unit, as well as its individual member countries, largely coincide with the strategic move of the US, which is highly correlated with the expansion of South Korea's defense industry in Europe and beyond.

South Korea has no choice but to muddle through such a monumental change in the global security structure until it consolidates its status as one of the top five defense industrial powerhouses to surpass Germany, Italy, the UK, and Spain.<sup>34</sup>

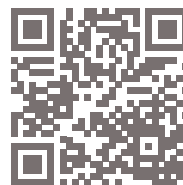
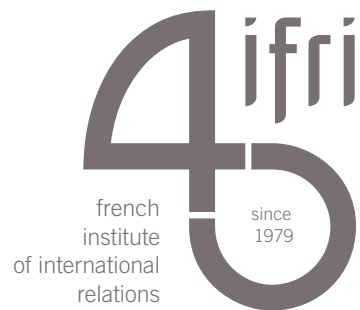
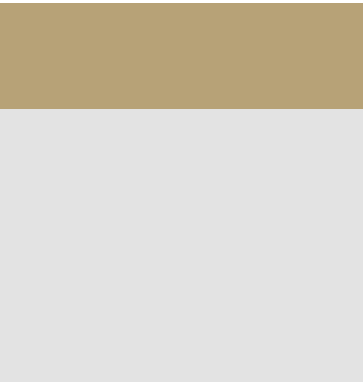
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34. Experts like Sieman Wezeman (SIPRI) cautiously predict this. See: D. Yoon, "Ukraine's Hunger for Howitzers Transforms an Arms Industry", *The Wall Street Journal*, September 18, 2023, available at: [www.wsj.com](http://www.wsj.com).



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