Defence Industrial Outlook 2025

Global Outlook with a Focus on Fragmentation and Integration of the European Defence Industry

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Cover: Gripen E under assembly in Linköping, Magnus Hjalmarson Neideman SVD / TT

Sammanfattning

Denna utblick består av två delar, en återkommande del som ger en global försvarsindustriell överblick och en tematisk del som studerar integreringen av den europeiska försvarsindustrin under de senaste två decennierna.

Inom den globala försvarsindustrin har USA en nästan unik position vad gäller försvarsindustrins storlek, omfattning och sofistikation. Kina har ännu inte hunnit ikapp, men har minskat förmågegapet avsevärt. Ryssland har behållit sin breda omfattning, men uppnår en lägre nivå av sofistikering. Europas kombinerade försvarsindustrier är mycket avancerade med bred omfattning, men de saknar storlek.

Den europeiska försvarsteknologiska och industriella basen (EDTIB) är fortfarande djupt formad av nationella preferenser och ovilja mot storskalig integrering, vilket leder till dubbelarbete. Policyåtgärder för att öka integreringen av EDTIB har haft blandade resultat.

Nivån av integrering bland militära materielstockar i europeiska länder är på motsvarande sätt blandad. Alla marknadssegment innehåller en stor bredd av utrustning, men europeiska system utgör betydande andelar av många marknadssegment. När det gäller distinkta system och distinkta system per operatörsland finns det en svag trend mot integration. Ett mer holistiskt mått, såsom Herfindahl-Hirschman-indexet, visar dock en försiktig trend bort från integration.

Nyckelord: Försvarsindustri, USA, Kina, Europeiska union, integration, fragmentering

Summary

This outlook consists of two parts: a recurring section providing a global defence industrial outlook, and a thematic section studying the integration of the European defence industry over the last two decades.

Within the global defence industry, the United States holds a nearly unparalled position in terms of industrial size, scope, and sophistication. China has not yet caught up, but has significantly narrowed the capability gap. Russia has retained a broad scope, but achieves a lower level of sophistication. The combined European defence industries are highly advanced and broad in scope, but lack sufficient scale.

The European Defence Technological and Industrial Base (EDTIB) remains deeply shaped by national preferences and a reluctance towards large-scale integration, leading to duplicated efforts. Policies aimed at increasing EDTIB integration have yielded mixed results.

The level of integration among military equipment used by European nations is similarly uneven. There is a wide range of equipment in use across all market segments, but European systems represent significant shares in many of them. In terms of distinct systems, and distinct systems per operator country, there is a modest trend towards integration. However, a more holistic measure, such as the Herfindahl–Hirschman Index, provides a slight trend away from integration.

Keywords: Defence industry, US, United States, China, European Union, integration, fragmentation

Foreword

The Swedish Defence Research Agency, FOI, has a long tradition of conducting research regarding defence industrial capabilities, concerning both the Swedish domestic defence industry as well as international analyses and comparisons. Since 2024, FOI has also been tasked with studying the Swedish and international defence markets and the functioning of defence industries. To increase knowledge about the Swedish and international defence markets, reports have been published on, among other things, the competitiveness of Swedish defence companies in the European defence market, as well as collaborations and connections among European defence companies.

This report is intended to provide additional perspectives and knowledge about the global defence industry. It aims to give an updated overview of the current state of the global defence industry by comparing the capacities of the largest defence industrial countries. Furthermore, it hopes to offer new insights into the extent of fragmentation and the strategic debate concerning the defence industrial base in Europe.

This report is the second edition in a planned recurring series on the international defence market. The purpose of the series is to provide continuous and in-depth knowledge of the global defence industry and its key issues. This outlook is divided into two parts: a recurring section offering a global defence-industrial overview, and a thematic section, in this edition examining the fragmentation of the European defence industry over the past two decades.

The report is written on behalf of the Swedish Ministry of Defence, within the Defence Economics and Materiel Supply project. The project and authors wish to extend our gratitude to Herman Andersson (FOI), Ann Lundberg (FOI) and Aron Björk (FOI) for their valuable input and feedback during the factual review process. We would also like to thank Richard Anglais for his well-executed language review.

We hope you will enjoy the read!

Maria Hultqvist
Project Manager, Defence Economics and Materiel Supply
Stockholm, 15 October 2025

Executive Summary

Purpose and Context

The *Defence Industrial Outlook 2025 (DIO)*, produced by the Swedish Defence Research Agency (FOI), provides an overview of global defence-industrial developments and a focused analysis of **fragmentation and integration within the European Defence Technological and Industrial Base (EDTIB)**.

The study concerns a period of escalating instability—marked by **US–China rivalry**, **Russia's war against Ukraine**, and overlapping crises in the **Middle East**—that has driven global military expenditure to record highs. For Europe, these shocks have underscored its dependence on external suppliers and the limited capacity of its fragmented industrial base to respond to wartime demand.

The report has **two key objectives**:

To compare the **size, scope, and technological sophistication** of major global defence industries.

To assess **trends of integration and fragmentation** within Europe's defence-industrial landscape, using both policy analysis and empirical data on equipment stocks (2000–2025).

The Global Defence Industry

The global defence market remains concentrated around a few major powers. The United States dominates, with 41 of the world's 100 largest arms-producing firms and combined 2023 sales of USD 317 billion, followed by China with 9 companies with arms sales of USD 103 billion. The UK follows with 48 USD billion, then France and Russia. Other notable producers include Italy, Israel, South Korea, Germany, Japan, India, Türkiye, Sweden and Taiwan.

Only the US and Russia maintain a near full-spectrum defence-industrial scope. China has very broad scope, but still rely on a selected few foreign inputs. France and the UK also have very broad scope, but to some extent rely on foreign supply chains and cooperation. Middle defence industrial powers, such as South Korea, Germany and Sweden maintain broad but incomplete industrial capabilities, while even smaller countries specialise in niches.

In terms of technological sophistication, the US remains in a league of its own, pioneering many military innovations. China still lags somewhat behind the US technologically, but its rapid modernisation and increased degree of innovation has narrowed that gap and put China on par with advanced European countries. By contrast, Russia has lost in its relative technological sophistication, but it maintains a number of key technological edges. European defence industries are generally advanced, with a number of niche edges.

Overall, the US maintains a uniquely strong position in the global defence industry in terms of size, scope and sophistication. China lags behind the US in general terms, but has narrowed the defence industrial gap significantly and rapidly in recent decades. In a global context, Russia has a medium-to-large defence industry, with a scope that nearly covers all key market segments. However, it continues to trail most Western countries in technological sophistication, as it lacks funds to keep pace with other major powers, but it still has some niche advantages. European defence industries collectively possesses cutting-edge technology but lacks the size and scope of the US or China.

Policy Analysis

The European Defence Technological and Industrial Base (EDTIB) still remains **divided along national lines** despite decades of integration efforts. Procurement is still largely national, and Europe fields **dozens of distinct weapons systems** where the US operates only a handful.

Fragmentation stems from sovereignty concerns, divergent operational doctrines, and the protection of domestic industries. This limits economies of scale, complicates logistics, and reduces interoperability. However, fragmentation is **not uniform**:

- **Most integrated sectors:** aeronautics, missiles, and advanced electronics.
- **Least integrated:** naval shipbuilding, land vehicles, and munitions.

Institutionally, Europe has built an integration framework, including **OCCAR**, **EDA**, **PESCO**, and the **European Defence Fund (EDF)**, but these have yet to produce a cohesive industrial market. Collaborative projects remain complex and politically constrained.

Russia's invasion of Ukraine has nevertheless created renewed urgency: European defence spending is surging, but large parts of the **procurement** since 2022 has gone to **non-EU suppliers**, particularly the US. The risk is that Europe's rapid rearmament reinforces fragmentation rather than reduces it.

Trends in European Materiel Stocks

Using IISS *Military Balance* data, the report examines how equipment holdings across **land, air, and maritime domains** have evolved among **EU members**, the **UK**, and **Norway** for the period **2000-2025**. Integration is assessed by three indicators: number of distinct systems, share of jointly produced or developed European-origin equipment, and the Herfindahl–Hirschman Index (HHI) of concentration.

Land Systems

Land integration has progressed mainly through shared platform adoption, not joint development. HHI trends suggest divergence in APCs and IFVs, but convergence in MBTs. The share of European-developed systems increase in all three categories, but few systems are jointly developed.

- **Armoured Personnel Carriers (APCs):** Declined from 28,000 across 32 equipment design families to 12,500 units across 30 design families; US-made M113 is the most common model throughout the studied period, but the share of Soviet-origin systems is decreasing steadily in favour of European alternatives.
- **Infantry Fighting Vehicles (IFVs):** Dropped from 9,100 units across 18 design families to 6,200 units across 25 design families. The Soviet BMP-1 decreased the most in terms of inventory share, while a wide variety of primarily European systems increased.
- **Main Battle Tanks (MBTs):** Fell precipitously from 15,600 to 4,400 units, with three countries divesting their MBT inventory completely. The share of Soviet T-72s and T-54/55s decreased from almost half to less than a quarter, while the share of Leopard 2 has increased steadily, now used by 13 countries.

Indirect fires systems are diverging in terms of HHI primarily due to the lessened dominance of American and Soviet systems.

- **Indirect fires**: Inventory share across all three categories (towed howitzers, self-propelled howitzers, rocket artillery) have decreased. The largest decrease in stock size is among towed howitzers.

Air Systems

The air domain is characterised by a large share of jointly developed European systems, a large share of American systems and a low and decreasing share of Soviet legacy systems. Fixed-wing combat aircraft is the only category that is becoming more integrated (as measured by HHI) across all periods, but the process is slow.

- **Fixed-Wing Combat Aircraft:** Fleet sizes have shrunk as a higher number of older airframes are replaced with fewer numbers of more modern ones. The F-16 remains in wide use throughout the measurement period, with the Eurofighter Typhoon increasing in stock share since its introduction in the early 2000's. While the F-35 has been purchased by numerous countries, it has not been delivered in sufficient numbers to makeup a sizeable stock share in 2025. The most prolific Soviet platform, the MiG-21, has been entirely divested by 2025.

- **Fixed-wing Transport Aircraft:** Very few Soviet platforms in use, with C-130 and Transall C-160 being the most common models in 2000. Airbus A400M replaces the C-160 as the most prolific European alternative in the mid 2010's, with more than half of stocks being made up by C-130 and A400M by 2025.
- **Helicopters:** Very few countries use attack helicopters, with commensurately few suppliers. The Eurocopter Tiger/Tigre is the most common platform in 2025, but the American AH-64 is a close second. The transport helicopter market is well diversified, but with a large and increasing share of European platforms. From 2015, the share of jointly developed platforms increase sharply as the NH-90 gains market share.

Maritime Systems

Europe's shipbuilding base remains strong but **highly fragmented**. All classes of maritime systems are characterised by an overwhelming share of single-country European systems, with multinational European systems being a distant second by 2025. The share of American and Soviet systems remains at single-digit percentages throughout the measurement period.

- **Surface Combatants:** The size of surface fleets have decreased, mostly due to a decrease among smaller (corvettes, frigates) ships, but the market remains as diverse as ever, with many countries producing their own models. Some notable multinational projects are the FREMM and MEKO frigates, but they are in use only with the developing countries.
- **Submarines:** Attack submarine stocks have decreased by roughly a third, while the number of systems per operator has increased slightly. The major submarine exporter is Germany, supplying submarines to five of the sample countries.

Overall Findings and implications for Europe

- **Technologically advanced but structurally fragmented:** Europe's industries rival the US in quality but remain small and nationally siloed.
- **Slow but measurable integration:** Legacy Soviet systems are disappearing, and shared Western platforms are expanding, yet genuine industrial integration remains limited.
- **Institutional progress, industrial inertia:** EU frameworks exist but lack enforcement and harmonised demand.
- **Ukraine as inflection point:** Massive rearmament could either drive long-sought integration or entrench dependence on non-European suppliers.

In summary, *DIO 2025* depicts a **European defence industry at a turning point**: technologically capable, institutionally active, but still struggling to act as a single system. Whether Europe achieves genuine industrial integration will depend on transforming wartime urgency into coordinated, long-term policy and investment.

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1 Introduction

Anton Hammarstedt, Calle Håkansson, Per Olsson

The heightened great power rivalry between the United States (US) and China, Russia's ongoing war against Ukraine, doubts about US commitment to European security and overlapping armed conflicts in the Middle East have all contributed to a deteriorating international security environment. This has led to drastic increases in global military spending, not least in Europe. Meanwhile, several European policy initiatives have been launched with the aim to increase defence industrial production, innovation, and integration.

Increased military spending has been accompanied by a rapid and pronounced increase in demand for military equipment, highlighting the importance of the global defence industry. It is therefore important for decision-makers and the public to have an updated and accurate overview of trends within the global defence industry. The Defence Industrial Outlook (DIO) report series by the Defence Economic research group at the Swedish Defence Research Agency (FOI), aims to provide such an overview.

This recurring series provides a broad overview of the global defence industry. It also includes a thematic section focusing on a more specific topic. This year's edition examines the trends of fragmentation and integration within the European defence industry and market, both from a policy and an empirical perspective.

Consequently, the report is divided into two main parts. The recurring global outlook is presented in Chapter 2, where the study assesses and compares the defence industrial capabilities of the world's largest arms-producing countries. Updating this outlook is especially relevant given the current international security environment.

The thematic part of the study consists of Chapters 3 and 4. Chapter 3 outlines and explores the debate surrounding the fragmentation and integration of the European Defence Technological and Industrial Base (EDTIB). The focus on fragmentation trends within the European industry and market has been chosen due to the strong emphasis by EU institutions and member states on reducing fragmentation and increasing defence integration within Europe. However, there is also a growing need to map and understand Europe's materiel stocks in order to gain a comprehensive picture of the current state of affairs.

Thus, Chapter 4 examines whether signs of integration can be observed over time by analysing changes in European materiel inventories, with a particular focus on how the degree of integration or fragmentation, in terms of equipment in use and countries of origin, has evolved. Finally, Chapter 5 provides the report's concluding remarks.

1.1 Research Objective

This study has two research objectives. The first is to provide an updated overview of the global defence industry by assessing and comparing defence industrial capabilities of major defence-producing countries in terms of size, scope, and sophistication.

The second objective relates to the thematic part of this report and aims to enhance understanding of developments within the European military equipment market, specifically policies and trends towards increased defence industrial integration over the last two decades. In this regard, this section maps the current state of fragmentation and integration within the European defence industrial market. It does so by analysing materiel stocks to assess how these have evolved over time in Europe.

1.2 Method and Data

This study is mainly descriptive in nature and employs different methods across its different chapters. Chapter 2 uses a combination of quantitative data, previous studies, and the authors' own assessments to provide a broad and approximate assessment and comparison between major defence industrial countries. Chapter 3 relies on a combination of policy documents and previous studies, as well as the authors' assessments to provide an overview of European defence integration policies. Chapter 4, meanwhile, employs a quantitative methodology to assess trends in European defence integration using data on equipment stocks. These methods are described in more detail in each chapter.

The study uses quantitative data to describe both the global defence industry and the European arms market. The two main data sources are the Stockholm International Peace Research Institute (SIPRI) and the International Institute for Strategic Studies (IISS). These data are supplemented with information on equipment country of origin as compiled by the authors. IISS's *The Military Balance* provides data on military equipment stocks globally. Figures for selected equipment categories from the 2000, 2005, and 2010 editions, as well as figures from IISS's online version, *Military Balance+* for 2015, 2020, and 2025, have been collected and grouped into market segments by the authors for the purpose of analysis. The study further uses SIPRI's arms sales data for the world's top 100 arms-producing companies, which provides an approximation of defence industrial size among large arms-producing countries. SIPRI further offers data on military expenditure globally.

Moreover, this study draws on secondary academic and policy literature to outline and investigate the historical development of integration in the policy field, with a special emphasis on recent European (EU) initiatives.

2 The Global Defence Industry

Per Olsson

This chapter outlines and compares the defence industrial capabilities among the world's major arms producing countries,[1] in terms of size, scope and sophistication.[2] These general descriptions rely on varying degrees of quantitative data and qualitative assessments. Therefore, the results should not be seen as exact estimates, but rather as broad illustrations of relative positions.

2.1 Size of Defence Industries

In this chapter, the size of a given country's defence industry is measured in terms of revenue from arms sales in USD. Data on arms sales have been retrieved from the SIPRI *Arms Industry Database*, which covers the world's 100 largest arms-producing companies.

Ideally, any study assessing a given country's defence industrial size would use data describing the exact amount of financial, capital, and human resources available to the defence industry within that country. However, such data would be highly difficult and time-consuming, if not impossible, to obtain and similarly difficult to compare in any meaningful way. Instead, this chapter relies on SIPRI arms-sales data for companies with headquarters located in a given country as a proxy.

The SIPRI *Arms Industry Database* is an extensive and proven database, but using it for the purpose of estimating defence-industrial size comes with some caveats. First, the data only includes the top 100 companies globally. While this may skew the results somewhat, the consequences are likely manageable. The size of company sales tends to decrease exponentially within the top 100 list, meaning that companies outside this group should have relatively limited impact on overall arms sales. More consequential is that total arms-sales data does not distinguish between arms sales originating from a company's home country and arms sales by that company's offshore subsidiaries. This risks inflating the estimated defence-industrial size of countries that are home to large multinational arms producers. These caveats do not negate the results of this chapter, but are factors worth keeping in mind when interpreting them.

Figure 1 illustrates the size of the 15 top defence-industrial entities. For the sake of presentation, only those are presented here. For a complete list of the top 100 arms-producing companies by country of headquarters, including ranking, arms

[1] Defined as the countries which are home to the 100 top arms-producing companies; see SIPRI (2024) *Arms Industry Database*. Accessed 2025-04-30.

[2] The assessment in this report is an abbreviated update of the global outlook in Olsson, et al. (2022) *Defence Industrial Outlook–A Global Outlook with a Specific Focus on the European Defence Fund*.

sales in USD, and share of global arms sales for 2023 compared to 2014, see Appendix A.

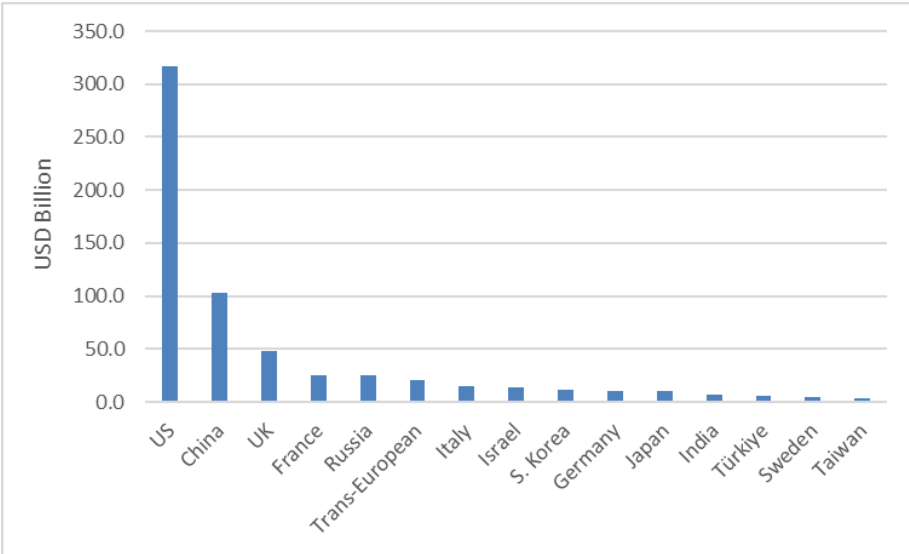

Figure 1: Arms Sales among the 15 Largest Defence Industrial Countries, 2023

US arms-producing companies represent the largest share of global arms sales by a significant margin, accounting for slightly over three times the sales of second-place China. In 2023, the US was home to 41 of the world's 100 largest arms-producing companies, with combined arms sales of USD 317 billion. US arms-producing companies include the so-called "Big Five." These consist of Lockheed Martin, which among other weapon systems produces aircraft, missiles, and C4ISR[3] systems; Raytheon, which produces missiles and aircraft engines; Northrop Grumman, which produces aeronautics and C4ISR systems; aircraft producer Boeing; as well as aerospace, IT, and maritime systems producer General Dynamics. Other major US arms producers include L3Harris Technologies, shipbuilder Huntington Ingalls Industries, Leidos, Amentum, and Booz Allen Hamilton, among many others.[4]

China was home to the second-largest defence industry in 2023, with nine companies on the top 100 list and combined arms sales of USD 103 billion. Leading Chinese arms-producing companies include aircraft producer AVIC; ground vehicle, small arms, and munitions producer NORINCO; IT and electronics producer CETC; aerospace producers CASC and CASIC; as well as shipbuilder CSSC.

[3] C4ISR, abbreviation for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance.
[4] For a more detailed company description, see, Olsson, et al. (2022).

The UK was home to the third-largest defence industry, with seven companies and USD 47.7 billion in arms sales on the top 100 list. British arms-producing companies include conglomerate BAE Systems, engine producer Rolls–Royce, and shipbuilder Babcock. France, with five companies and USD 25.5 billion, has the fourth-largest defence industry. French arms-producing companies include, for example, conglomerate Thales, aerospace company Dassault, and shipbuilder Naval Group. Russia has the fifth-largest defence industry, with two companies on the top 100 list: conglomerate Rostec and shipbuilder United Shipbuilding Corporation, with combined sales of USD 25.5 billion.

The top five defence-industrial countries on SIPRI's top 100 list were followed by trans-European companies, Italy, Israel, South Korea, Germany, Japan, India, Türkiye, Sweden, Taiwan, Singapore, Ukraine, Poland, Norway, Canada, Spain, and the Czech Republic.

2.2 Scope of Defence Industries

The scope of a given country's defence industry is assessed in terms of the numbers of sectors or categories it covers. An equipment category is "covered" if the domestic defence industry is able to supply that equipment category to its own country's armed forces, see Table 1. While it is theoretically possible that a country's defence industry could produce an equipment category for foreign buyers but not its own armed forces, this is unlikely in practice.

The defence industry of a given country is considered to cover a sector if it has the ability to domestically (D) develop and produce a certain equipment category for that country's armed forces. A given country can partly possesses the capability develop and produce equipment domestically (D*), for instance with a significant degree of foreign inputs. A country may also be able to develop and produce part (P) of the equipment for its home country's armed forces within a certain category. A country may have some capability to develop and produce a given equipment category in cooperation (C) with another country's defence industry. A country may be unable to develop and produce the equipment required by its home country's armed forces, which instead must import (I) that equipment category. A country can also import, but produce a significant part of components domestically (I*).

The classification is based on the equipment in active service of the home country's armed forces, using data from IISS's *The Military Balance*. An analysis based on equipment stocks has the advantage of relying on proven and accessible data. However, it might underestimate the capabilities of rapidly modernising countries, which still have foreign equipment in their inventory. Similarly, it risks overestimating the capabilities of countries that have previously relied on their domestic arms industry, but have lost some of that capability over time.

The equipment categories included in this report are combat aircraft, attack helicopters (attack hel), main battle tanks (MBT), infantry fighting vehicles (IFV),

self-propelled artillery (SP Art), surface combatants (surface comb), and submarines (subs).

Table 1. Defence-Industrial Development and Production Capabilities.[5]

Country	Combat Aircraft	Attack Hel	MBT	IFV	SP Art	Surface Comb	Subs
1. US	D	D	D	D	D	D	D
2. China	D*	D*	D*	D*	D*	D	D*
3. UK	P	I*	D	D	D	D*	D
4. France	D	C	D	D	D	D*	D
5. Russia	D	D	D	D	D	D	D
6. Italy	P	D	D	D	C	D*	C
7. Israel	I	I	D	D	I	D*	I*
8. Germany	C	C	D	D	D	D*	D
9. S. Korea	I	P	D*	D*	D	D*	D*
10. Japan	I*	I	D	D	D	D*	D
11. Türkiye	I	C	I	P	I*	P	I*
12. India	I*	P	P	I*	P	D*	I
13. Sweden	D*	–	I	D	D	D	D
14. Taiwan	P	I	I*	-	I*	P	I
15. Singapore	I	I	I	D	D	P	I

D = domestically developed and produced equipment, D* = mainly domestically developed and produced with some imported equipment or large share of imported components, P = partly domestically developed and produced equipment, C = developed and produced through cooperation, I = imported equipment, I* = mainly imported equipment with local production or components- - = country does not have equipment in service.

Table 1 shows the defence-industrial scope of the top 15 defence-industrial countries. A general, and intuitive, observation is that the countries with the largest defence industries also display the broadest defence-industrial scope.

The US and Russia are the only two countries with a complete defence-industrial scope across the included segments. China has an almost complete scope, but with a mix of imported and domestic combat aircraft, while much of its domestically produced equipment has been derived from foreign technology.

The UK has an almost complete scope, although it imports some combat aircraft and attack helicopters. Meanwhile, France also has an almost complete defence-industrial scope, but it has cooperated in the development of attack helicopters and some of its surface combatants.

[5] For types, see IISS (2024) *The Military Balance 2024*. For country of origin, see various open online sources, e.g., Janes.com, Defence News.com, Naval News.com, Reuters.com.

Italy, Israel, Germany, Japan, South Korea, and Sweden all have broad defence-industrial scopes, developing and producing most of the included segments. The other countries on the top 100 company list mostly import their military equipment, but have a few or several niche segments of domestic development and production.

2.3 Sophistication of Defence Industries

The sophistication of a given country's defence industry is presented in terms of the assessed innovativeness and technical advancement of that industry. This assessment is partly based on findings from previous studies by, e.g., Richard Bitzinger, Michael Raska, and Cheung Tai Ming, with updated and additional assessments by the author.[6]

Estimating how sophisticated or advanced a given country's defence industry will inevitably be contentious as there is no exact data to base such an assessment on, instead it is based on existing knowledge and acquired experience. Therefore, any such assessments will be subjective by nature and as such vulnerable to the clandestine nature of the defence industry, the difficulty in comparing the relative performance of military equipment between countries, as well as the misconceptions and outdated knowledge of the author. Therefore, it is especially important that this factor be viewed as a very broad and approximate assessment, rather than any exact estimation.

Previously published works are not immune to these complications, but may offer some insights and assistance. In this study, the "pyramid of innovation" model by Raska and Bitzinger provides a starting point for further discussion. This model outlines and compares the innovative capabilities of various countries. The pyramid model is not a one-to-one fit with the sophistication aspect of this study, as it to some extent takes size and scope into account. However, while not exclusively illustrating innovative capabilities and technological leadership, it offers a valuable template for assessing defence industrial sophistication.

The US defence industry has a very high degree of technological sophistication and is leading or pioneering within most defence market sectors globally, including 5th generation combat aircraft, nuclear submarines, and C4ISR capabilities, to name a few. Overall, this gives the US defence industry a unique position among

[6] Raska, Michael & Bitzinger, Richard (2020) "Strategic Contours of China's Arms Transfers," *Strategic Studies Quarterly*, Bitzinger, Richard (2015) "New ways of thinking about the global arms industry–Dealing with 'limited autarky,'" *Strategic Insights*, and Cheung Tai Ming (2010) "A typology of defense technological innovation and the place of the Chinese defense economy," in Tai Ming Cheung (ed.) *The rise of the Chinese defense economy: Innovation potential, industrial performance, and regional comparisons*.

countries, with a level of defence-related R&D that provides cutting-edge technologies: the only so-called Tier 1a country.[7] France, the UK, and Germany all have highly sophisticated defence industries; although not as advanced as the US, they belong to the 1b category of Raska and Bitzinger's model.

Countries such as Italy, Sweden, Israel, and Taiwan can be classified as niche innovators, i.e., classified as Iier 2a. These countries lack the same broad innovation scope of Tier-1 countries but possess several areas of excellence. Countries such as South Korea and Japan are classified as fast followers, category 2b. This generally means that they are behind the Tier-1 countries, but can still develop advanced equipment and are generally catching up. Note that, while 1a should be considered generally more advanced or innovative than 1b, 2a does not necessarily mean more advanced than 2b. These are just as much distinguished by scope: 2a is highly innovative in specific niches, while 2b is more moderately innovative but over a larger scope. 2c, on the other hand, lags behind the other Tier-2 categories.

Raska and Bitzinger did not include India and Türkiye, which the author placed in Tier 2c, as they are broad-based producers with the capability to adapt and incorporate technologies, but with relatively limited indigenous R&D capabilities. Tier 3 contains arms producers with basic arms production capabilities with limited R&D. However, none of the top defence-industrial countries belongs to this tier.

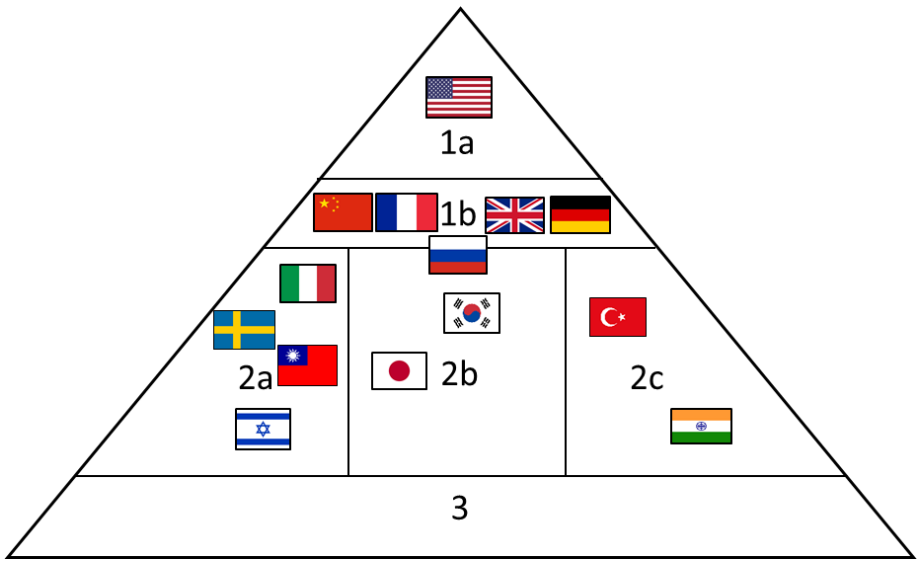

Figure 2: Raska and Bitzinger's *Pyramid of Innovativeness*, with the 15 Largest Defence-Industrial Countries, 2022

[7] Raska & Bitzinger (2020). For the position of the US regarding defence-industrial innovativeness, see, also, e.g., Bitzinger (2015).

The present author has made some adjustments to the illustration offered in Figure 2, particularly regarding China and Russia.

Raska and Bitzinger ranked Russia as Tier 1b, but its lack of funding makes it difficult to keep pace with the US and China. The war in Ukraine has clearly demonstrated that it has lost much of its technological edge. Accordingly, in this study, Russia was moved closer to Tier 2b. While it retains a number of highly advanced sectors, it is increasingly difficult to argue that Russian technology remains on par with the other Tier-1b countries. Meanwhile, China's defence industry has made significant strides in recent decades, but still lacks certain key capabilities and technologies. In terms of defence-industrial sophistication, China has gone from a fast follower or niche innovator[8] to a more highly advanced provider of military equipment. According to the author of this chapter, given its increasingly technologically advanced military equipment and heavy investment in defence-related R&D, China should qualify for the Tier-1b category.

2.4 Comparative Assessment

In order to present and compare the defence-industrial capabilities of the largest arms-producing countries, this section assesses and ranks them based in terms of size, scope, and sophistication, as shown in Figure 3.

As stated above, industrial size is measured by total arms sales, while scope refers to the number of market segments. Sophistication is assessed based on the general technological advancement of military equipment developed and produced within a given country, drawing on previous studies and the author's own assessments.

These rankings should be seen as approximations, rather than precise positions; technological sophistication is especially difficult to assess with a higher degree of accuracy. These assessments are also generalisations about the country's entire defence industry. A country may be market-leading in certain sub-segments yet rank lower overall, while another may lag in specific areas but still place highly.

The comparison shows that the US maintains a unique position in the global defence industry. Its defence industry is by far the largest in terms of size, covers nearly the entire range of defence-market segments, and exhibits a uniquely high level of technological sophistication, often pioneering or leading globally.

China's defence industry is also large and spans a very broad range of defence-market segments. It has made significant strides in catching up to Western countries technologically. Although China arguably still lags behind the US in general terms, its rapid modernisation and increased degree of innovation puts it on technological par with advanced European countries.

[8] Bitzinger, R. (2016). "Reforming China's defense industry," *Journal of Strategic Studies* 39:5–6, pp. 785–786.

In a global context, Russia has a medium-to-large defence industry, with a scope that nearly covers all key market segments. However, it continues to trail most Western countries in technological sophistication, as it lacks funds to keep pace with other major powers, but it still has some niche advantages.

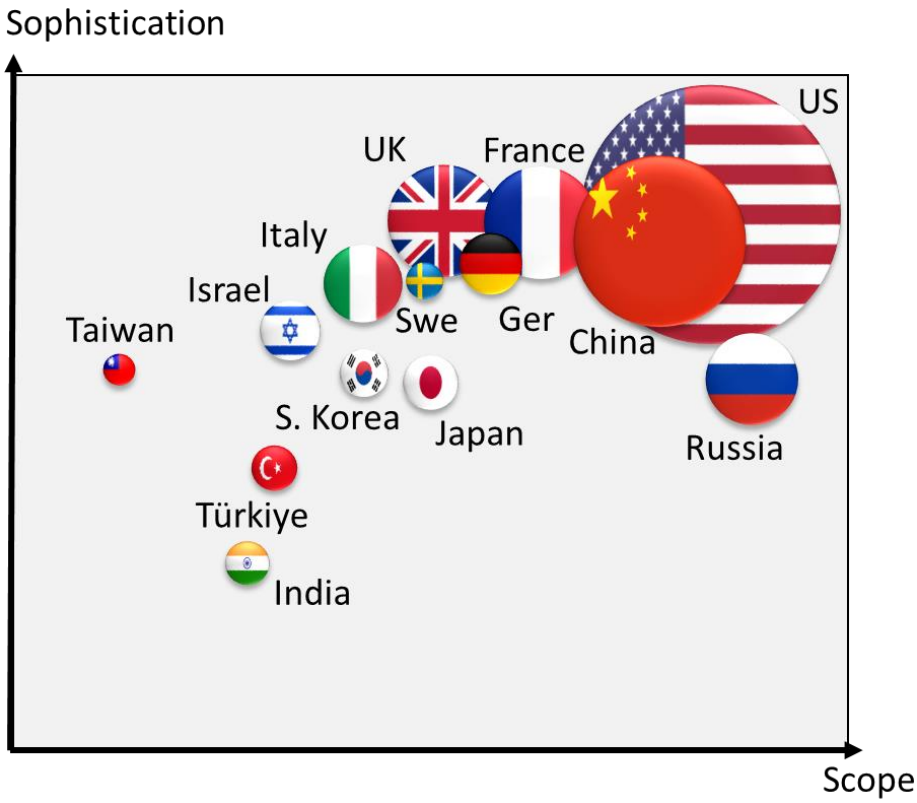

Figure 3: Comparison between Largest Defence Industrial Countries, 2022

European defence industries are generally sophisticated, but medium to small in size and scope. The French defence industry is medium sized, with very broad scope, and a high level of technological sophistication. Similarly, the UK defence industry is at the upper end of the medium-sized range, with broad scope and high sophistication. The defence industries of Germany and Italy are also medium sized, with broad scopes, and are highly sophisticated.

The defence industry of Poland is small, with a narrow but increasingly broad domestic scope and growing technological sophistication. However, this might change in the future, given Poland's ambitious investments in defence. Sweden's defence industry also has a broad scope of defence-industrial capabilities and is highly sophisticated, but remains small. Norway's defence industry is highly sophisticated, but small, and covers a limited scope of defence-market segments.

Ukrainian defence industry is small in size and, as a developer of new equipment, narrow in scope. In terms of technological sophistication, it can be characterised as an adapter and innovation-follower, with some niche advantages. However, its main immediate goal is to produce for the ongoing war.

In Asia, the defence industries of Japan, South Korea, and Taiwan are medium sized, with medium scope and a relatively high level of technological sophistication. Meanwhile, Singapore is a niche producer, small in size and narrow in scope, but with relatively high technological sophistication in the products it makes. India's defence industry is medium in both size and scope, with moderate levels of overall technological sophistication.

In the Middle East, Israel's defence industry is medium sized in both scope and size, with a high level of technological sophistication. Türkiye's defence industry is expanding but still relatively small. It displays an increasingly broad scope and growing technological sophistication; it is a fast follower, with some niche advantages.

Canada has a relatively small defence industry with relatively limited scope, but is able to produce rather advanced weapons and components.

To reiterate, the above assessment offers a generalised overview and should not be seen as a detailed evaluation, a qualification that is especially true for the dimension of technological sophistication. However, the assessment draws upon previous studies and corresponds fairly well with the degree of modernisation within the respective armed forces of several of the included countries. Overall, the assessment provides an approximate picture of the global defence industry and the comparative position of the twenty largest defence-industrial countries. This assessment also provides a baseline for the further discussion about European fragmentation and integration in the upcoming chapters.

3 European Defence-Industrial Integration and Fragmentation

Calle Håkansson

3.1 Introduction

The European Defence Technological and Industrial Base (EDTIB) stands at a critical juncture. While advanced and capable in many respects, as outlined in the previous chapter, it remains deeply shaped by national preferences, institutional path dependencies, and a historical reluctance towards full-scale integration. In the aftermath of the Cold War, European institutions have repeatedly sought to foster greater cooperation and consolidation in the defence-industrial domain.[9] Yet despite decades of policy initiatives, the European defence-industrial landscape continues to be seen and described as highly fragmented.[10] This fragmentation is manifested both in the continued dominance of nationally oriented procurement decisions and in the multiplicity of weapon systems and production platforms in use across the continent. As underlined in the recent report by Mario Draghi:

> The European defence industry is also fragmented, limiting its scale and hindering operational effectiveness in the field. The EU defence industrial landscape is populated mainly by national players operating in relatively small domestic markets. Fragmentation creates two major challenges. First, it means that the industry lacks scale, which is essential in a capital-intensive sector with long investment cycles (...) Second, fragmentation leads to serious issues related to a lack of standardisation and the interoperability of equipment.[11]

This chapter examines the dynamics underpinning this persistent state of division, while also acknowledging that the picture is more nuanced than often portrayed. The chapter traces the evolution of the European defence-industrial base from the end of the Cold War to the present day, focusing on both the drivers of cooperation and the constraints that have hampered deeper integration. The literature on the matter reflects a broad range of views: some point to sovereignty concerns, strategic cultures, and economic protectionism as enduring barriers to collaboration, while others highlight geopolitical shifts, the rising cost of defence innovation, and the proactive role of EU institutions as drivers pushing towards greater integration.

[9] Uttley, M (2018). Defence Procurement. In: Galbreath, D.J., and Deni, J.R. (eds.). (2018*). Routledge Handbook of Defence Studies* (1st ed.). Routledge.

[10] European Commission and HR/VP (2025). JOINT WHITE PAPER for European Defence Readiness 2030, Brussels, 19.3.2025 JOIN(2025) 120 final. See, also: Alvarez-Couceiro Fernandez, P. (2023). Europe at a strategic disadvantage: A fragmented defence industry, *War on the Rocks.*

[11] European Commission (2024a). The future of European competitiveness—A competitiveness strategy for Europe.

The chapter further engages with the longstanding debate on the costs of fragmentation, such as inefficiencies, duplication, and missed economies of scale, and examines why certain sectors (e.g., aeronautics and missiles) have experienced consolidation, while others (such as naval and land systems) remain largely nationally segmented.

Moreover, the chapter situates recent developments, notably Russia's full-scale war of aggression against Ukraine, as a catalyst that has exposed both the limitations and latent potential of the EDTIB. The war has triggered a surge in defence spending, a reassessment of industrial capacity, and renewed debates over the strategic implications of procurement choices. It has also intensified discussions about the role of third-country suppliers and the implications of Europe's continued reliance on non-EU manufacturers.

Overall, this report aims to provide a better understanding of the state of the market and the fragmentation of materiel stocks in Europe, or, as emphasised by Mölling and Hellmonds (2024), that "there is an urgent need for a baseline assessment of the state of the EDTIB."[12] Through this analysis, this chapter outlines the broader strategic debate on how European states have chosen to cooperate on defence-industrial matters. It does so by conducting a focused literature review, drawing on academic and think-tank sources as well as official documents from European institutions.

3.2 Fragmentation of the European defence industry

The academic and policy literature overall shows and outlines that the European defence industrial base is still highly fragmented, with companies mainly operating on a national basis. In that regard, an influential 2017 report by the Munich Security Conference has significantly influenced the debate on defence-industrial fragmentation in Europe in recent years.[13] More recently, Hartley (2024) has similarly highlighted that the European defence-industrial base remains characterised by duplication and fragmentation, a lack of collaboration leading to failures in exploiting economies of scale, and a technology gap with the United States.[14] The

[12] Mölling, C., and Hellmonds, S. (2024). Sovereign: A dynamic defence industrial and technological base. Paper requested by the European Parliament's subcommittee on Security and Defence (SEDE), EP/EXPO/SEDE/FWC/2019-01/LOT4/1/C/24.

[13] Bachmann, D., Bunde, T., Maderspacher, Q., Oroz, A., Scherf, G., and Wittek, K., (2017). "More European, More Connected and More Capable: Building the European Armed Forces of the Future," Munich: *Munich Security Conference, McKinsey, Hertie School of Governance.*

[14] Hartley, K. (2024). European Defence Policy: Prospects and Challenges, *Defence and Peace Economics*, *35*(4), 504–515.

fragmentation of the European defence industry can be understood here as the absence of a genuinely integrated and collaborative approach within the defence sector. Driven by national interests and divergent procurement strategies, this lack of coordination is widely seen as hampering efficiency, leading to duplication of efforts and increased overall costs.[15]

The current state of the European defence market has historical roots, as the development and procurement of defence equipment in Europe have traditionally been dominated by national companies. This has had a significant impact on the overall European Defence Technological and Industrial Base. For example, at the end of the Cold War, European states invested 90% of their procurement budgets in national companies. Furthermore, European collaborative projects to develop various types of military platforms have often been characterised by rising costs and intra-industry rivalries.[16] Today's EDTIB is also still moulded by post-Cold War decisions, where economic considerations took precedence over defence and security concerns.[17]

In the late 1990s and early 2000s, we nevertheless saw a phase of mega-mergers and consolidation in the global defence industries, mainly in the US but also within the European industry (e.g., Airbus, MBDA), driven in part by increasing production costs and the ambition to achieve economies of scale.[18] Thus, over time, some parts of the European defence industry have become increasingly consolidated and Europeanised, while other segments have continued to remain fragmented along national lines.[19] The consolidation is most evident in the aeronautics, advanced electronics, and missile sectors, while cooperation in the naval and land sectors has been more limited. This has, among other factors, been explained by the higher capital intensity of the aeronautics, advanced electronics, and missile sectors compared to other sectors in defence.[20]

The consolidation and internationalisation phase of the European defence industry in the late 1990s and early 2000s also meant that these companies became less

[15] See also: Clapp, S. (2024). Reinforcing Europe's defence industry, *European Parliamentary Research Service*, PE 749.805 – November 2024 EN; Béraud-Sudreau, L., and Scarazzato, L. (2023). Beyond Fragmentation? Mapping The European Defence Industry In An Era Of Strategic Flux, *CSDS* In-depth, 2023/07.

[16] Calcara, A., Gilli, A., and Gilli, M. (2023). Short-term readiness, long-term innovation: The European defence industry in turbulent times, *Defence Studies*, *23*(4), 626–643.

[17] Mölling, C., and Hellmonds, S. (2023). Security, Industry, and the Lost European Vision (#EDINA II), *German Council on Foreign Relations*, DGAP Report – No. 10, October 2023.

[18] Devore, M.R. (2013). Arms Production in the Global Village: Options for Adapting to Defense–Industrial Globalization, *Security Studies*, *22*(3), 532–572.

[19] Kleczka, M., Buts, C., and Jegers, M. (2020). Addressing the "headwinds" faced by the European arms industry, *Defense & Security Analysis*, *36*(2), 129–160.

[20] Weiss, M, and Biermann, F. (2018). "Defence Industrial Cooperation." In Meijer, H., and Wyss, M., (eds.), *The Handbook of European Defence Policies and Armed Forces* (Oxford, 2018; online ed., Oxford Academic), accessed 28 Jan. 2025; Droff, J., Guiberteau-Ricard, J., and Malizard, J. (2024). The Influence of Strategic Procurement on the Performance of the European Naval Defense Industry, *Defence and Peace Economics*, 1–25.

dependent on their home markets and more reliant on international exports, which has also affected the structure of the European industrial base.[21] It has also been outlined that while we saw this strong phase of consolidation around the turn of the millennium, procurement decisions by European states have often continued to follow mainly national lines. However, some studies suggest that national preferences have at least in part declined with the consolidation of segments of the European defence industry.[22] With that said, the past few decades of declining European defence budgets (from the end of the Cold War up to around 2014) have also meant that European states have often pursued advanced and expensive defence systems, but in small volumes, which has impacted the capacity of the European defence industry. Moreover, another reason the European defence industrial base is described as fragmented is that European countries have often purchased American defence equipment, both due to limited capabilities within Europe and a desire to strengthen defence ties with the United States.[23] Finally, despite the increasing development of production costs for defence equipment and competition from larger defence players, small and medium-sized states have nevertheless managed to continue developing their own defence-industrial base. This has persisted largely because it remains the preferred political choice among most European states.[24]

Despite this process of (partial) consolidation, the discussion on the problems of the fragmented European defence market persist. In an earlier analysis of the European Commission's communications on defence matters since the 1990s, it is evident that the Commission has consistently highlighted the fragmentation of the European defence-industrial base as one of the foremost problems to address. In all 16 of its communications since 1996 through to 2025, the Commission has used these issues as key arguments for promoting better collaboration within the sector.[25] This has also led to a discussion on the different materiel systems used in Europe and what they say about the state of defence-industrial fragmentation. An often-cited 2017 European Commission study outlines the fact that Europe has 29 different types of destroyers and 20 types of fighter planes, compared to four and

[21] Calcara, A., Gilli, A., and Gilli, M. (2023). On consolidation in the US defence industry; see, also: Scarazzato, L., Liang, X., Tian, N., and Lopes da Silva, D. (2024). Developments in Arms Production and the Effects of the War in Ukraine, *Defence and Peace Economics*, *35*(6), 673–693

[22] Kluth, M. (2017). European defence industry consolidation and domestic procurement bias, *Defense & Security Analysis*, *33*(2), 158–173.

[23] Mueller, T. (2024a). Strategic options for the European defence industry in the 2020s, *Defense & Security Analysis*, 1–32.

[24] Devore (2013).

[25] Håkansson, C. (2023a). From market integration to security integration: Taking the next steps for European defence–industrial cooperation, *The Swedish Institute of International Affairs*, UI Brief no.5, May 2023; See also: European Commission and HR/VP (2024). A new European Defence Industrial Strategy: Achieving EU readiness through a responsive and resilient European Defence Industry, Brussels, 5.3.2024, JOIN(2024), 10 final; European Commission and HR/VP (2025).

six, respectively, for the United States. Overall, this 2017 study reported that Europe uses 178 different major weapons systems and platforms, while the US operates around 30.[26]

The 2024 Draghi Report similarly highlights and explains that the market is predominantly run by national players, with fragmentation resulting in both a lack of scale in production and insufficient standardisation and interoperability of equipment. Like earlier reports, it draws comparisons between EU member states and the US, noting that EU states in 2024 now operate twelve different main battle tanks, whereas the US produces only one. It also highlights a significant degree of fragmentation in Europe in segments such as naval surface vessels, conventionally powered submarines, infantry fighting vehicles (IFVs), and missiles.[27]

Russia's full-scale war against Ukraine has also clearly illuminated the problems European states face in terms of defence-industrial capacity. Since the outbreak of the war, defence spending has risen to fill gaps and enhance European defence capacities. That said, a significant portion of the increased spending is being used to address existing shortfalls and replace material donated to Ukraine. Moreover, decades of downsizing the industry due to lower European demand and spending have clearly affected the continent's industrial capacity today. Another issue in developing and enhancing European defence industrial capacity lies in the difficulties of restarting or scaling up production, compounded by supply chain disruptions, bottlenecks, and a shortage of skilled workers. In recent decades, we have also seen a focus on the development of highly sophisticated platforms, albeit in lower numbers, such as fighter jets or other advanced systems.[28] This has impacted investment in other types of equipment and materiel, such as munitions or land systems. Another frequently cited reason for fragmentation in Europe regarding different equipment is the historical tendency to develop national requirements and engage in "gold-plating"[29] when jointly developing systems and materials. However, and ultimately, some duplication and fragmentation of the European defence-industrial base is likely to persist, as states seek to support their own industries due to sovereignty concerns and economic considerations.[30]

However, more recent analyses have argued that the fragmentation of the European defence industry is more nuanced than previously outlined.[31] The degree of

[26] European Commission (2017a). Reflection Paper on the Future of European Defence (Brussels: European Commission, June 2017). See also: Mueller, T. (2024b). Drivers and Impact of European Defence Market Integration: A Literature Meta-Synthesis with Economic Focus, *Defence and Peace Economics*, 1–36; Koenig, N., Schütte, L., Knapp, N., Köhler, P., Kump, I., and Pauly, J. (2023). Defense Sitters: Transforming European Militaries in Times of War. Munich: *Munich Security Conference*, June 2023.
[27] European Commission (2024a).
[28] Mejino-Lopez, J., and Wolff, G. (2025). Boosting the European Defence Industry in a Hostile World, *Intereconomics*, 60(1), 34–39.
[29] National overregulation, add-ons, etc.
[30] Aries, H., Giegerich, B., and Lawrenson, T. (2023). The Guns of Europe: Defence–industrial Challenges in a Time of War, *Survival*, 65(3), 7–24.
[31] Olsson, P. (2021). The European Defence Market—Unevenly Fragmented, FOI Memo 7739.

fragmentation varies between different sectors and regions in Europe.[32] Andersson (2023) notes that the industrial base is less fragmented than often assumed. He demonstrates that, in segments of major weapon systems, production within the EU is actually in line with that of the US, except in the naval sector. The historical tendency to prioritise national requirements for different types of equipment can nevertheless be seen as leading to costlier products and reduced interoperability.[33] Moreover, as underlined by Olsson in an earlier study, "Europe may operate 12 tanks versus only 1 for the US, but that does not mean that the European tank market is 12 times more fragmented. The current market fragmentation is in large part due to legacy systems making up a significant part of the inventories of European countries'."[34] The increasing consolidation of the US defence industry has also been shown to have negative consequences as well.[35] For instance, the US Department of Defense has outlined that: "consolidation and market concentration generally lead to reduced competition and create sourcing risks," and that, "as a result, the DoD is increasingly reliant on a small number of contractors for critical defense capabilities."[36] Finally, different states have different operational needs and design philosophies, which have, and will continue to, affect the materials developed and used in various countries.[37]

The ongoing war in Ukraine has clearly affected the workings of the industry. Since Russia's full-scale invasion and war on Ukraine, the European defence industry's order books have steadily increased, a trend expected to continue in the coming years. This creates opportunities for strengthening cooperation within Europe, but may also lead to further fragmentation if the orders are placed in an uncoordinated manner.[38] The consequences of the war have led to a focus on building up European capacities in sectors such as munitions, air defence, land systems, and drones, while other sectors, such as naval and aerospace, have not been as significantly affected thus far.[39] We also see that, as Central and Eastern European states shift from legacy Soviet-made equipment towards Western-made materiel, the fragmentation of defence equipment in Europe may decrease.

There remains the need to better outline the situation in the European market and materiel stocks in relation to the discussions on fragmentation. For instance, there

[32] Béraud-Sudreau and Scarazzato (2023).
[33] Andersson, J.J. (2023). Building weapons together (or not): How to strengthen the European defence industry, *European Union Institute for Security Studies*. On national requirements in weapons, see, also: Bergmann, M., and Svendsen, O. (2023). Transforming European Defense: A New Focus on Integration, *The Center for Strategic and International Studies (CSIS).*
[34] Olsson (2021). p.7
[35] Andersson (2023).
[36] US Department of Defense (2022). "State of Competition within the Defense Industrial Base," p.5, p.1.
[37] Andersson, J.J., and Britz, M. (2025). The European Union's role in European defence industry policy. *Defence Studies*, 1–20.
[38] Mueller (2024a); Calcara, Gilli, and Gilli (2023).
[39] IISS (2025). Chapter One: Defence and military analysis, *The Military Balance*, 125:1, 6–11; The Economist (2025). Europe's armsmakers have ramped up capacity.

have been discussions about the "old truths" regarding the different equipment used in Europe, the procurement of materiel since the start of the war in Ukraine, and the implications of market consolidation.[40] In that regard, one analysis argued that, following the outbreak of the Russo-Ukraine war, between June 2022 and June 2023, 78% of procurement went to non-EU manufacturers.[41] This finding was cited both by the European Commission and the 2024 Draghi report. By contrast, the IISS, in a study from late 2024, in turn estimated that between February 2022 and September 2024, 52% of procurement spending went towards European-made equipment, 34% to US systems, and 14% to equipment from other countries, including South Korea, Israel, and Brazil.[42]

Past and present developments will both influence the continued evolution of the EDTIB. Some recent literature anticipates a new wave of consolidation in Europe to address the current challenges in the defence-industrial domain. The rationale for such consolidation, however, differs from that behind the last wave in the late 1990s and early 2000s. At that time, consolidation was driven by declining defence budgets and falling order volumes, whereas today it would be driven by the need to meet rising demand.[43]

Given the growing complexity of new defence platforms, it is increasingly being questioned whether individual European states can bear the R&D costs of developing these new platforms and systems. Still, discussions about the benefits of consolidation should be approached with nuance, as reduced competition could hinder innovation and drive up prices[44] It has also been argued that, while increased collaboration within Europe could strengthen the European defence industrial base, it may have negative effects for certain companies and countries, potentially creating "winners and losers" in the market. Furthermore, the primary industrial base is concentrated in a few European countries, which could further complicate EU-funded efforts to promote greater cooperation.[45] Finally, as the European defence-industrial base currently lacks sufficient production capacity, European states have increasingly purchased non-European weapon systems to meet urgent restocking needs and enhance their defence capabilities. This, in turn, could create future challenges related to system fragmentation across Europe.[46]

That said, in various sectors, production capacity is gradually increasing. For example, at present, there is only one active production line for main battle tanks

[40] Mölling, C., Schütz, T., von Voss., A., and Winter, T. (eds.) (2025). Crunch Time/Time Crunch for European Defence (#EDINA 4), *Friedrich Naumann Foundation for Freedom.*
[41] Maulny, J-P. (2023) The Impact of the War in Ukraine on the European Defence Market, *The French Institute for International and Strategic Affairs*, IRIS Policy Paper, June 2023.
[42] Hackett, J., and Schreer, B. (eds.) (2024). Building Defence Capacity in Europe: An Assessment, *The International Institute for Strategic Studies.*
[43] Mueller (2024a).
[44] Kleczka, Buts, and Jegers (2020).
[45] Hartley (2024).
[46] Hackett and Schreer (2024).

(MBTs) in Europe, down from four in 2000. However, ongoing investments could result in five different production lines by 2030, according to IISS. In terms of IFVs, production currently exists in Germany, Spain, Sweden, Italy, Finland, and Poland. In the naval sector, there are still several producers across Europe. Similar to the US, however, European shipbuilding capacity has declined over the past few decades. Finally, in the air domain, the US-made F-35 has increasingly become the aircraft of choice for many European states. Nonetheless, European aircraft production continues, with capacity in France, Italy, Germany, Spain, Sweden, and the UK.[47]

In conclusion, a substantial body of literature and policy discussion addresses the fragmentation of the European Defence Technological and Industrial Base. Yet, as demonstrated above, the discussion on the state of fragmentation is perhaps more nuanced than initially expected. The next section therefore outlines and discusses why states have chosen whether or not to cooperate within the defence-industrial domain.

3.3 Why Cooperate — or Not — in Defence-Industrial Matters?

To mitigate fragmentation and improve the state of the EDITB, greater defence-industrial integration within Europe has been actively promoted, especially since the 1990s. The results so far have been mixed. The academic and policy literature offers several explanations for why states have decided to integrate and cooperate—or not—on defence-industrial matters. This chapter outlines some of these drivers and explores the lessons from earlier integration processes. Broadly speaking, the literature identifies *structural*, *economic*, *legal*, and *institutional* drivers of integration in this field.

It has generally been shown that the level of cooperation varies across both countries and sectors in Europe. In the academic literature, it has been argued that states avoid seeking cooperation due to sovereignty concerns, a view often grounded in theories of realism.[48] On the other hand, others have focused on how structural forces for integration, such as geopolitics, a worsening security situation in Europe's neighbourhood, and changing transatlantic relations, have instead created pressure for integration within the defence-industrial market.[49]

In the economic literature, the fragmentation of the defence-industrial sector in Europe, combined with increased global competition in the field, rising development costs, and the prolonged period after the Cold War of declining defence

[47] Ibid.
[48] Weiss and Biermann (2018).
[49] See, e.g., discussions in Fiott, D. (2019). *Defence Industrial Cooperation in the European Union: The State, the Firm and Europe.* New York: Routledge.

budgets in Europe, has highlighted the need for better cooperation between European states.[50] In that regard, drawing on economic theories, some argue that states with competitive and large defence industries seek cooperation, while those with less competitive industries aim to protect their sectors.[51] There have also been examples of how the (economic) political culture of different states influences decisions to either seek or avoid cooperative defence-industrial projects.[52] Others, in turn, have outlined how the connections (*network politics*) between industry officials and governments have influenced European integration and cooperation in sectors such as the aeronautics domain.[53]

Within the legal literature, there has also been discussion on how developments in EU law and rulings by the EU Court of Justice have pushed forward the integration process (at least in some capacity) within this domain.[54] Finally, some have focused on the institutional forces within the European Union to integrate the defence market, particularly the role of the European Commission. This literature emphasises the integration forces and the entrepreneurial role of EU institutions in pushing for greater European integration within this policy field.[55] The EU institutions have been especially active since the late 1990s in promoting integration within the field of defence-industry matters. In the late 1990s and early 2000s, we also observed a phase of industrial consolidation, which, however, was driven by the industry itself due to lower European demand, increased international competition, the rising cost of developing new defence equipment, and greater reliance on international exports.[56]

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[50] See, e.g., Hartley, K. (2011). *The Economics of Defence Policy: A New Perspective* (1st ed.). Oxon/New York: Routledge.

[51] Calcara, A., and Simón, L. (2021). Market Size and the Political Economy of European Defense, *Security Studies*, 30(5), 860–892; Calcara, A. (2019). Cooperation and non cooperation in European defence procurement, *Journal of European Integration*, 42(6), 799–815.

[52] DeVore, M.R., and Weiss, M. (2013). Who's in the cockpit? The political economy of collaborative aircraft decisions, *Review of International Political Economy*, 21(2), 497–533.

[53] Weiss, M., and Biermann, F. (2021). Networked politics and the supply of European defence integration, *Journal of European Public Policy*, *29*(6), 910–931.

[54] Trybus, M. (2014) *Buying Defence and Security in Europe: The EU Defence and Security Procurement Directive in Context*. Cambridge: Cambridge University Press; Blauberger, M., and Weiss, M. (2013). "'If you can't beat me, join me!' How the Commission pushed and pulled member states into legislating defence procurement.'" *Journal of European Public Policy*, 20:8, 1120–1138.

[55] Guay, T. R. (1997). The European Union, expansion of policymaking, and defense industrial policy, *Journal of European Public Policy*, 4:3, 404–421; Mörth, U., and Britz, M. (2004). European integration as organizing: The case of armaments, *JCMS: Journal of Common Market Studies*, 42: 957–973; James, A.D. (2018). Policy entrepreneurship and agenda setting: Comparing and contrasting the origins of the European research programme for security and defense. In: N. Karampekios, I. Oikonomou, and E. Carayannis (eds.), *The Emergence of EU Defense Research Policy from Innovation to Militarization*. London: Springer, pp. 15–43; Håkansson, C. (2023b). *The New Role of the European Commission in the EU's Security and Defence Architecture: Entrepreneurship, crisis and integration*. Malmö: Malmö University Press.

[56] Béraud-Sudreau, L. (2020). "Integrated Markets? Europe's Defence Industry After 20 Years," In: Fiott, D. (ed.), *The CSDP in 2020: The EU's Legacy and Ambition in Security and Defence*. Paris: European Union Institute for Security Studies, 59–73.

Even so, the results of these different forces have been, at best, mixed. Overall, the European market is still viewed, as underlined in the section above, as fragmented, and collaborative projects within the domain have often been less successful in terms of economies of scale.[57] This is despite the growth of bilateral and minilateral cooperation (i.e., between groups of countries) through both formal and informal collaborative frameworks in the defence-industrial domain, many of which have been established since the 1990s. This includes, among others, the establishment of the Organisation for Joint Armament Cooperation (OCCAR), the Letter of Intent (LoI) Framework Agreement between the major European defence-industrial countries, the European Defence Agency (EDA), and later EU initiatives such as PESCO and the European Defence Fund (EDF).[58]

While cooperation in practice is seen to lead to more cost-efficient and technologically advanced defence products, it has also faced several difficulties in reality. As Mawdsley (2013) underlines, "collaborative procurement has all the complexities of a national procurement decision multiplied by however many states are involved in the project. Problems around control, delays due to different budget cycles, differences in requirements, and national protectionism" all impact collaborative projects.[59]

To conclude, the literature is mixed regarding both the drivers of European integration within the defence-industrial field and the results of these integration processes to date.

3.4 Conclusions

In sum, there is a greater need to map and understand the defence-material stock in Europe to outline the degree of fragmentation within the market today. By studying how materiel development has evolved over time in Europe, we can see how fragmented the industrial landscape really is and in what direction it is heading. The next chapter outlines the process of measuring this in detail.

We are also in a phase of transformation, with increasing defence spending across both Europe and globally.[60] This is likely to continue transforming and influencing the state of the European Defence Technological and Industrial Base (EDTIB) in the coming years and decades. The post-Cold War period has also been characterised by the process in Central and Eastern Europe of replacing older Soviet-made

[57] Calcara, A. (2020). *European Defence decision-making: Dilemmas of collaborative arms procurement*. Oxon/New York: Routledge.
[58] Weiss and Biermann (2018).
[59] Mawdsley, J. (2013). The A400M Project: From Flagship Project to Warning for European Defence Cooperation, *Defence Studies*, 13(1), 14–32.
[60] SIPRI (2025). Unprecedented rise in global military expenditure as European and Middle East spending surges.

legacy equipment with modern Western-made materials. This is also very likely to affect the general state of fragmentation within the materiel stock in Europe.

Looking ahead, however, we see that the European defence industrial base has not been able to meet wartime demands of today, and that third countries such as the US, South Korea, Israel, and Türkiye, along with their industries, have increasingly become part of the efforts to rebuild European defences.[61] The US industry has always been an integral part of European defence, but other players have been argued to have increased their footprint in the European market since the start of the Ukraine war. The ambition over the past decades to seek greater competition and consolidation of the market has also been called into question, given the fact that the European industry has faced difficulties in meeting today's defence-industrial demands.[62] This is an aspect that could likely influence and further increase fragmentation in the future. As outlined by Koenig et al. (2023): "Europeans face a trilemma: they can develop and procure equipment nationally, off-the-shelf abroad, or in cooperation with others. Each option involves different trade-offs between costs, control, speed, industrial interests, and European fragmentation."[63]

To conclude, this chapter outlines and identifies various reasons why states have chosen to integrate and cooperate on defence-industrial matters, as well as why they have not. The chapter also provides a nuanced discussion of fragmentation within the European defence industry, and traces developments in the field from the 1990s to the present day. However, what do the defence materiel stocks in Europe look like, and what do they reveal about trends in fragmentation and integration? In the next chapter, we explore these questions empirically.

[61] Hellemeier, L.F. (2025). Europe's Defence Industry More Than Two Years after Russia's Full-scale Invasion: Plus ça change, plus c'est la même chose? *European Review of International Studies, 11*(3), 439–469.
[62] Mölling and Hellmonds (2023).
[63] Koenig et al. (2023).

4 Trends in European Materiel Stocks

Anton Hammarstedt

EU initiatives to reduce fragmentation and promote further integration have had mixed results, as seen in the previous chapter. This chapter further examines *how* the results have been mixed, whether the level of integration has shifted over time and whether there are differences between market segments. By examining changes over time for a large number of systems, this section aims to contribute to the ongoing debate on European defence-industrial integration. The present chapter seeks to accomplish this by examining stocks of some classes of materiel systems across the ground, air, and maritime domains. The dataset is a panel of country-equipment observations for the years 2000, 2005, 2010, 2015, 2020, and 2025, for member countries of the European Union, along with Norway and the United Kingdom.

The primary measure of integration versus fragmentation is along the axis of equipment design family: the more a market segment has converged, or has been converging, on a single system, the more integrated that market segment is. This obviously does not show the entire picture, but it is what is measurable with the current data, and it tells at least part of the story. The convergence towards fewer systems (or lack thereof) is measured by the number of distinct systems per operator country within each equipment class (market segment), as well as the Herfindahl-Hirschman Index; see Section 4.1.5 below.

A secondary measure is the extent to which European needs are supplied by European cooperative development projects. While a world in which all European nations used the Leopard 2 is more integrated than one where every nation produces their own tank, a world in which all European countries band together to jointly develop an MBT is more integrated still. The bilateral or multilateral cooperative projects that supply some European military forces with some of their systems are discussed under the various equipment class headings.

4.1 Method and data

The data used in this chapter consists of a panel of year-country-equipment observations from the *Military Balance+* web database for 2025, 2020, 2015, and equivalent observations from the *The Military Balance* series of publications for 2010, 2005, and 2000. The countries under consideration are the current 27 EU member states, along with the UK and Norway.

4.1.1 Equipment design family

"Equipment design family" is the nomenclature used in *The Military Balance* for the broader subdivision of materiel systems, while simply "equipment" refers to the narrower term. For some examples, see Table 2 below.

Table 2. Examples of equipment and corresponding equipment design families

Equipment design family	***Equipment***
M109	M109A5
M109	M109A3GN
NLD Karel Doorman	Karel Doorman
NLD Karel Doorman	Leopold I
Mowag Piranha	Piranha IIIC
Mowag Piranha	VCR 8x8 Dragon

The unit of analysis in this chapter is the equipment design family. For equipment in use in 2015 or later, the equipment design family from IISS's *The Military Balance+* has generally been used. The author has assigned older systems either to these equipment design families, or to completely new ones. The BMP family of vehicles, treated as a single equipment design family in *Military Balance+*, has been split into BMP-1, BMP-2, and BMP-3, for example.

4.1.2 Domain and class

The equipment categories from *Military Balance+* have been collapsed into slightly broader classes. Some categories have a one-to-one correspondence to classes (e.g., main battle tanks), while some categories have been collapsed (wheeled and tracked APCs into APCs). A complete breakdown is available in Appendix B. Some equipment design families have been assigned a new class based on the author's judgment regarding the design family's capabilities and use cases. Specifically the Bv 206 has been excluded from the APC class due to not being armoured, and the Falcon and Gulfstream families of passenger transport aircraft have been excluded from the tanker/transport class due to their small size and cargo capacity relative to the other transport aircraft in the study.

4.1.3 National origin

The dataset has been augmented with information regarding national origin at the equipment design family level, from a variety of open sources. National origin is defined as the country where an equipment design family was originally developed. Measuring national origin in this way is far from trivial: many systems are developed in one country with vital parts or technology from another. In the general case, the developer of the actual system has been used as the basis for national origin, even if the system relies on imported components. Generally, some system B developed in country B that is a straight upgrade or development of some other a system A developed in country A is counted as:

- having been developed in country A if country B is upgrading existing stocks of the system (for example, the Polish PT-91 Twardy being counted as USSR-developed T-72's).
- having been developed in country B if the system is based on system A, but country B produces the units from scratch, or nearly from scratch (the Romanian M-84 being counted as a distinct Romanian-developed system as opposed to a T-72 variant, for example).

Cases where either the manufacturer's nationality or the constellation of national stakes has changed over time, have been categorised to the best efforts of the author. In such cases, the system is categorised according to the national ownerships of the manufacturer at the time when the system was developed (Airbus transport planes being counted as partly Spanish if they were developed after 2009, for example).

In cases where some Company X from Country X has acquired the rights or designs for some system developed by Company Y from Country Y, the system is counted as having been developed in Country Y if the system was developed while Company Y was located in Country Y (the Bo-105/BK105 being counted as German, for example, despite at the time of writing being manufactured by a French company).

An additional difficulty is that some nations in which a system was developed no longer exist. To alleviate the difficulty of disentangling whether a system from e.g. Czechoslovakia was developed in Czechia, Slovakia or both, countries belonging to the former Czechoslovakia, Yugoslavia, and USSR are collapsed into these three countries for the purposes of determining *national origin*. The constituent countries of former Czechoslovakia, Yugoslavia and USSR are still counted separately for the purposes of measuring *ownership*.

Finally, some edge cases have been decided by authorial fiat, for example, the Steyr/Saurer 4K-4/7FA being counted as joint Greek/Austrian because the majority of extant stocks consist of the Greek ELVO Leonidas variants, instead of the Austrian original.

4.1.4 Data on equipment stocks

Only equipment for which IISS has published a number of units in stock has been considered; equipment for which the only available information is that the country has "some" units of a system is excluded. Where IISS publishes a bound ("at least X units," "Z–Y units," "<X units"), some reasonable point within that bound has been chosen as the point estimate for that equipment-country-year combination. In some cases, equipment that is present in a country's inventory in year $y-1$ and $y+1$ is assumed to exist also in year y. The amount in stock in such cases is assumed to lie at the midpoint between the amount in year $y-1$ and the amount in year $y+1$.

Only equipment that IISS judges to be in a country's active inventory has been considered—in the case "X units, Y units in storage," X units are used for the study.

4.1.5 Measuring integration

Integration is measured among existing stocks of materiel in the sample countries.

The three measures used to construct a holistic picture of the level of integration within each market segment are: the number of systems per operator country over time, the share of stocks jointly produced by European countries, and the Herfindahl-Hirschman Index (HHI). The first two measures are straightforward, but the HHI is explained below.

The HHI is calculated by determining the market share and then summing the squares. When used to calculate the level of monopoly in a market segment, the market shares of firms are used to calculate the sum of squares across a market segment. In this study, equipment design families (Leopard 2, BMP-2, etc.) are treated as analogous to firms, and equipment classes (tanks, infantry fighting vehicles, etc.) are treated as analogous to market segments.

The HHI for class C in year y is calculated as follows:

$$HHI_{C,y} = \sum_{i=1}^{n} \left(\frac{Q_{i,y}}{Q_{C,y}} * 100 \right)^2$$

Where $Q_{i,y}$ is the quantity of extant stocks of equipment design family i in year y, and $Q_{C,y}$ is the quantity of extant stocks of all equipment of class C in year y.

The Herfindahl-Hirschman Index is maximized at 10,000, when there is only one producer with 100% market share. In the case where there is three producers with 50%, 30% and 20% market share respectively, the index would be 3800.

The US department of Justice uses HHI in their role as enforcers of American antitrust legislation, and considers a market highly concentrated above 1,800 points and moderately concentrated between 1000 and 1,800 points. [64] As we shall see in the following chapter, most market segments under consideration in this study are moderately concentrated or higher, according to these criteria.

[64] US Department of Justice (2024)

4.2 Land systems

4.2.1 Land systems for manoeuvre units

This section examines three classes of land systems used by manoeuvre units: armoured personnel carriers (APCs), infantry fighting vehicles (IFVs), and main battle tanks (MBTs). Vehicles that IISS classifies as armoured utility vehicles (AUVs), as well as reconnaissance (recon) vehicles, light tanks, and other armoured fighting vehicles, are excluded.

4.2.1.1 Armoured personnel carriers

Armoured personnel carriers are, in some sense, as discussed in Chapter 2, relatively easy to manufacture. APCs are therefore one of the most widely distributed production chains in our sample, with more than half of the countries in the sample having some domestic manufacturing. This may also be why the market for APCs does not shift much over time; it trends neither towards increased nor decreased integration.

This study counts vehicles as APCs if they offer protection against small arms and shrapnel, are armed with at most a machine gun or grenade machine gun, and can carry a squad-sized dismounted element. Such vehicles are counted as APCs regardless of whether they are tracked or wheeled. Since many APCs are highly modular, and since the source data can sometimes lack information about the specific variant in question, some vehicles counted under APCs are likely to be command post vehicles, recon vehicles, or mortar carriers, and to a lesser extent, ATGM[65] carriers. As many combat vehicles are available in both APC and IFV configurations, there is bound to be some overlap between the APC and IFV categories.

[65] Anti-Tank Guided Missile

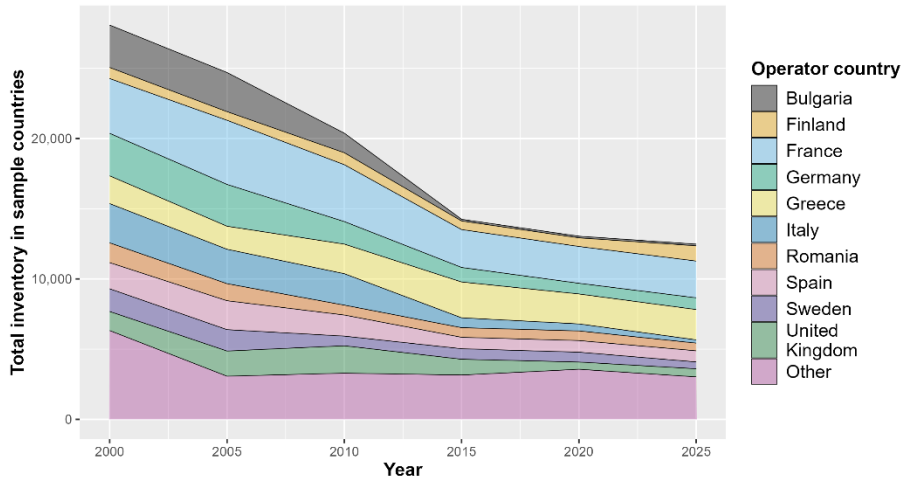

Figure 4: Armoured personnel carriers, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of APCs in any of the sample periods; all other countries are collapsed into “Other.”

There were 28,000 APCs in inventory in the sample countries in 2000, which dropped down to 12,500 in 2025. 27 countries in the sample had some number of APCs in inventory in 2020, representing 32 different equipment design families. The corresponding numbers in 2025 were 25 countries, representing 30 different equipment design families.

The American M113 was the most common model throughout the measurement period. While the M113 is, or has been, in service with 10 different countries, the VAB is the second most prolific APC family, due to France’s fielding them in large numbers (with the only other user, Cyprus, not significantly affecting the total at this macro scale).

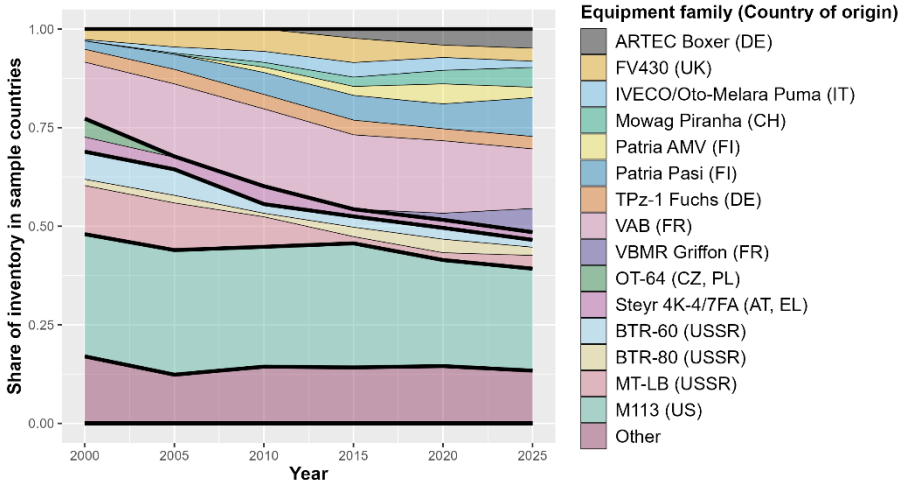

Figure 5: Armoured personnel carriers, design families as a share of the total European (EU + UK+ NOR) inventory, 2000–2025. Shown are those design families that rank among the 6 most prolific in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European, USSR, US). Nation-of-origin category for design families in "Other" not shown.

The legacy MT-LB, in service in some former Warsaw Pact countries (as well as Sweden, which bought some 500 units from Germany in the aftermath of reunification), made up some 15% of APC stocks at the beginning of the studied period, but its share of total stocks has been decreasing steadily as more countries have moved away from them in favour of Western systems. The two other Soviet systems, the BTR-60 and BTR-80,[66] have not decreased as much as the MT-LB, with Soviet systems making up roughly 25% of the European APC inventory at the start of the measurement period, declining to slightly below 10% in 2025.

Most systems, apart from the M113 and the Soviet BTRs and MT-LBs, are mainly in service with the countries that developed them. The Patria systems Pasi and AMV are exceptions, with nine countries apart from Finland having operated one or both families during the measurement period.

4.2.1.2 Infantry fighting vehicles

IFVs are, to simplify, APCs with autocannons. The primary weapon system of a unit mechanised in APCs is generally the dismounted element (the APC may provide fire support to a degree), while the primary weapon system of a unit mechanised in IFVs is the IFVs themselves.

[66] Only the original APC variant, without an autocannon, is included in this section.

Compared to an APC, apart from heavier armaments, an IFV is more likely to have better protection and sensors, and to have a larger logistical footprint due to bulkier ammunition, higher weight, and more specialised components. IFVs may be more limited in how many dismounts they carry, but this will vary heavily based on system and doctrine.

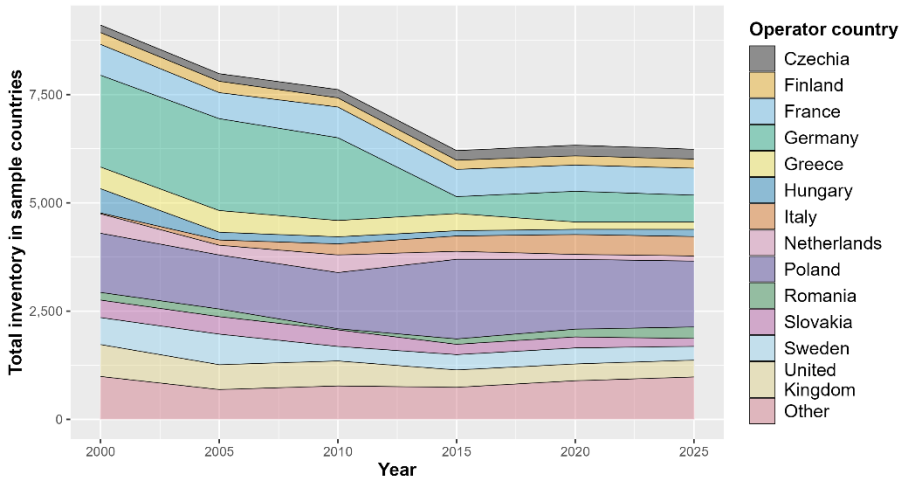

Figure 6: Infantry fighting vehicles, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of IFVs in any of the sample periods; all other countries are collapsed into “Other.”

There were roughly 9,100 IFVs in inventory in the sample countries in 2000, which decreased by almost a third to 6,200 in 2025. In 2000, 18 distinct IFV families were operated by 20 countries. The corresponding figures for 2025 were 22 IFV families operated by 24 countries.

The decrease in total IFV stocks is smaller in percentage terms than the decrease in APC stocks. This could imply a move towards heavier mechanised forces, or it could be an effect of the APC stocks being older, and thus sold off first.

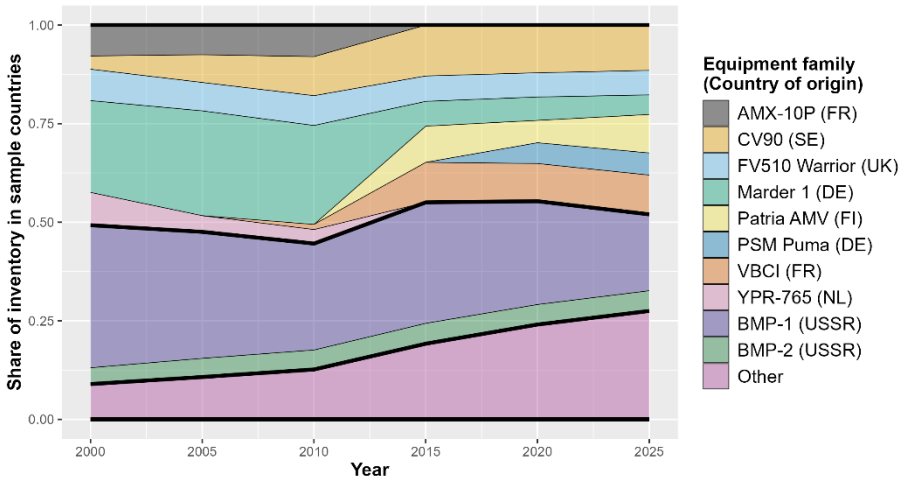

Figure 7: Infantry fighting vehicles, design families as a share of total European (EU + UK+ NOR) inventory, 2000–2025. Pictured are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into “Other.” The thick lines divide nation-of-origin categories (single-country European, USSR). Nation-of-origin category for design families in “Other” not shown.

The most prolific model in 2000 was the BMP-1 and its derivatives, accounting for roughly a third of IFV stocks at the start of the studied period. In 2025, there were roughly 1,200 BMP-1s in stock, making up almost a fifth of IFVs in inventory. While still significant, this reflects a decrease of BMP-1 proliferation by almost half.

The most common IFV developed in one of the sample countries was the Marder 1 at the start of the measurement period. The Marder 1’s adoption was entirely driven by the Bundeswehr, with the Marder being used exclusively by Germany until the very last periods, when 40 units were acquired by Greece. The British FV510 Warrior is another case of a large country driving the proliferation of a native system, with the UK armed forces being the only user.

There are no collaboratively developed IFVs among the top 8 most prolific design families in any of the sample periods. The most prevalent collaboratively developed IFV in the sample is the ASCOD, a joint venture between Austria and Spain (in Spanish service as the Pizarro, and in Austrian service as the Ulan). The system has not seen any export success, and remains in use only in these two countries. The Ajax family of vehicles, developed by General Dynamics UK for the British Army, is, however, based on the ASCOD. The ASCOD makes up 5% of IFV stocks in 2025, while the Ajax makes up less than 1%.

The CV90, a single-country development, has seen export success primarily to smaller nations, being in use with six of the sample countries. The general pattern,

though, is that the larger countries tend to produce IFVs to fill the needs of their own armed forces, like with APCs.

4.2.1.3 Main Battle Tanks

Main battle tanks (MBTs) are heavily armoured vehicles, equipped with a large-calibre (usually 120 or 125mm) main gun mounted in a turret, designed to fight other such vehicles. This section only concerns itself with main battle tanks, and does not include light tanks, reconnaissance vehicles or fire support vehicles.

24 of the sample countries had MBTs in inventory in 2000, which decreased to 21 in 2025. The number of equipment design families decreased from 15 to 13 during the same time period. The famed "12 different types of battle tanks" [67] or "17 different types of combat tanks" [68] can both be arrived at by drawing different distinctions between which tanks are different "types" (are T-54/-55s the same type or not? T-72s and PT-91s?).

In total, there were roughly 15,400 MBTs in inventory in 2000, which had decreased to 4,400 by 2025.

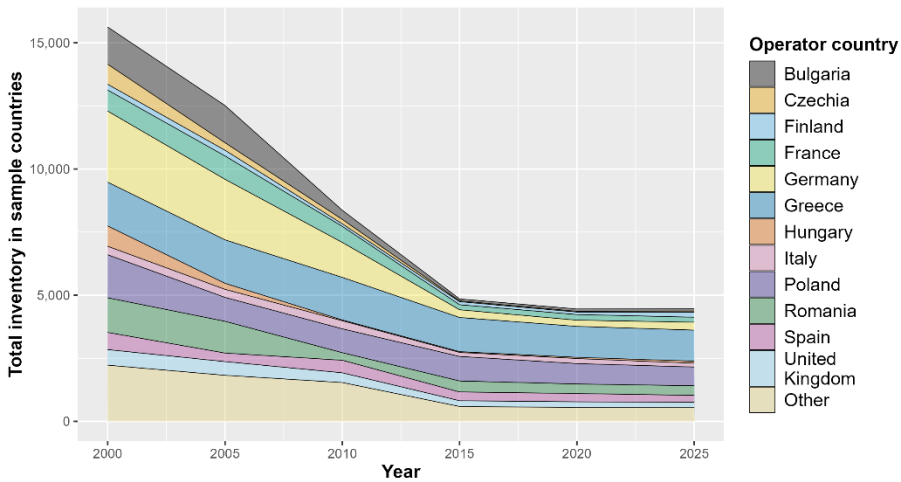

Figure 8: Main battle tanks, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of MBTs in any of the sample periods; all other countries are collapsed into "Other."

The first year of the studied period is characterised by a large share of Soviet equipment, with almost half of Europe's tank inventory being made up of T-72s

[67] European Commission (2024a).

[68] European Commission (2017b).

and T-54/55s. This share drops precipitously across the measurement period, with the two legacy models making up a quarter of the tank inventory in 2025. The former USSR's position as a major contender on the European market has lessened over time, due to countries in Eastern Europe transitioning to Western-made materiel, while most countries have reduced their tank stocks.

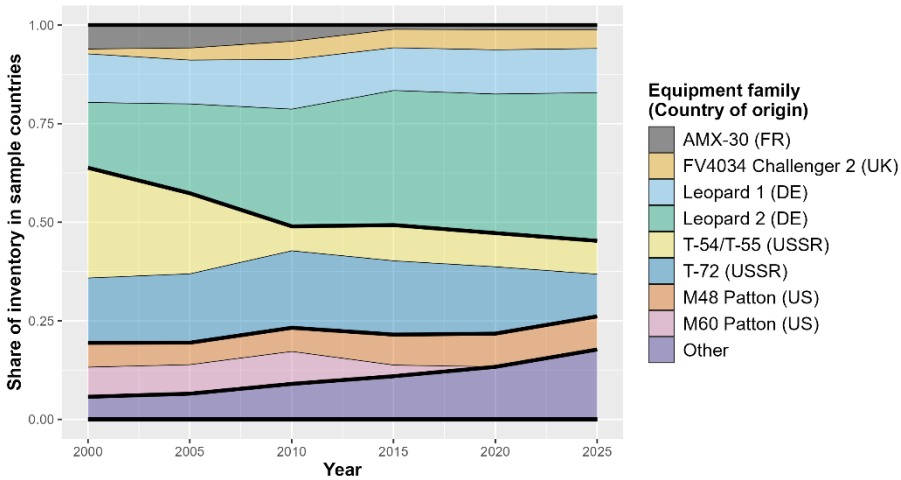

Figure 9: Main battle tanks, design families as a share of total European (EU + UK+ NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, USSR, US). Nation-of-origin category for design families in "Other" not shown.

Soviet legacy models are not the only ones being divested throughout the measurement period. M48 Patton and AMX-30 show a similar (albeit less pronounced) pattern. While their share of tank stocks is fairly constant over time, the Leopard 1 and M48 Patton also decrease in absolute terms from the early 2000s and onwards, reflecting the sharp decline in tank stocks illustrated in Figure 8.

What looks like a sharp increase in the number of Leopard 2s across the studied period is in reality a *slight* decrease in Leopard 2s that coincides with a *sharp* decrease of the other tank models. The number of Leopard 2s declines from 2,600 to 1,700 between 2000 and 2025. As with the Marder 1 IFV, Germany is the driver of this trend, decreasing its Leopard 2 inventory from around 1,700 units in 2000 to just over 300 units in 2025. While not weighing up for the effect of Germany's reducing the size of its tank inventory, the Leopard 2 has been widely adopted across Europe, with 13 operator countries in 2025 compared to six in 2000.

Compared to Germany and the former USSR, the US is not as well-positioned as a supplier of tanks for the European market. US-developed tanks only make up roughly 14% of European tank stocks in 2020 and 12% in 2025. At the start of the

studied period, the majority of these stocks consist of the legacy M48 and M60 Pattons, which are, or have been, fielded by Greece, Portugal, and Spain. The only European country fielding modern American tanks is Poland, which fielded 14 M1A1 Abrams in 2024, but has ordered a total of 116 M1A1 and 260 M1A2.[69]

Apart from the major tank exporters, some European countries, such as France, Italy, Romania and the UK, design and manufacture tanks for domestic use but have little or no exports. The tanks in the sample that were designed and manufactured in former Yugoslavia, the M-84, are in use exclusively in Slovenia and Croatia, two former Yugoslavian countries.

4.2.1.4 Integration of land systems for manoeuvre units

Across the three classes of land systems discussed in this section, the common pattern is a decreased stock volume over time. Infantry fighting vehicles have decreased the least in percentage terms, likely due to some countries choosing to place a higher emphasis on more qualified mechanised units as opposed to infantry formations mechanised (or motorised) with APCs.

The other common trend is that Soviet stocks are being divested in favour of Western systems. This can be seen primarily in the IFV and MBT classes, while the initial share of Soviet-developed APCs is lower, which implies a lower rate of divestment.

Table 3. Summary statistics for land systems for manoeuvre units

Equipment class	Year	Total stocks	Operator countries	Systems	Systems per country
APC	2000	28,072	27	32	1.19
	2025	12,477	25	30	1.20
IFV	2000	9,106	20	18	0.90
	2025	6,238	24	22	0.92
MBT	2000	15,624	24	15	0.63
	2025	4,461	21	13	0.62

Table 3 above presents summary statistics for these systems. The number of distinct systems has fallen for both APCs and MBTs, but increased for IFVs. The number of operator countries has developed similarly, and the number of systems per country remains roughly unchanged across all three equipment classes.

Figure 10 below shows Herfindahl-Hirschman indices for these same equipment classes. While Table 3 captures only the number of systems and operator countries, such measures do not take into account whether only a few units of some systems exist, while the sample countries have largely converged on another. The HHI in

[69] The Defense Post (2025).

Figure 10 provides a measure of market concentration as described in Section 4.1.5, and thus partially alleviates this.

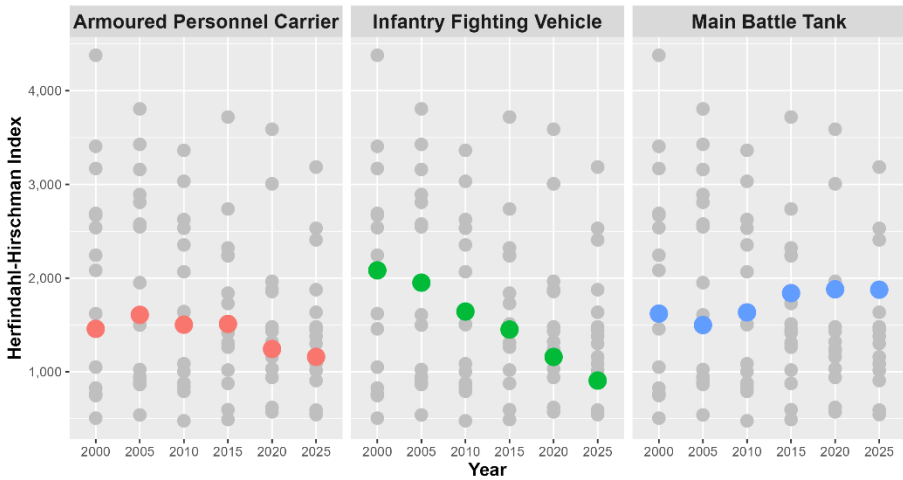

Figure 10: Herfindahl-Hirschman indices for ground systems for manoeuvre units (APCs, IFVs, MBTs), 2000–2025. Colour-coded dots represent the equipment class, while greyed-out dots show all equipment classes included in the study.

Compared to the summary statistics in Table 3, the HHI for IFVs declines sharply, by roughly half from 2000 to 2025. HHI for APCs declines more modestly, by around 30% from its high in 2005. This indicates a more even distribution across different systems; the "market" has become less "monopolistic."

On the APC side, this is driven by a reduced proliferation of the American M113 (although it is remains the most widespread system in 2025), while the IFV's decreased HHI is largely due to the divestment of legacy BMP-1 platforms.

The M113 remains the most common APC family, with around 20% market share, and the French VAB is a close second throughout the measurement period. If France's modernisation programmes result in relatively fewer Grifons and Servals, the HHI will decrease further. IFVs are even more diversified. The BMP-1 remains the most popular variant across the measurement period, owing to its widespread adoption in almost all former Eastern Bloc nations. Its market share drops precipitously over time, from 36 to 19 per cent between 2000 and 2025. This is the primary factor behind the HHI's decline during the same period. Some Western IFVs, such as the CV90, have achieved broad adoption, but they are generally operated by countries with smaller armed forces, limiting their effect on the HHI.

The HHI for tanks does not develop in a similar pattern due to two reasons:

Firstly, the Leopard 2 has clearly emerged as the dominant tank among Europe's land forces. Unlike the IFVs, many major countries have chosen to adopt the Leopard 2 instead of developing their own third-generation tanks. The exceptions generally belong to two categories: countries such as Italy and France have continued to develop their own MBTs, while others, such as Greece and Spain, retain sizeable stocks of older tanks, which are nevertheless augmented by a core of modern Leopard 2s. Countries of the former Warsaw Pact continue to operate some number of primarily T-72s, even as they gradually increase their share of Western hardware.

Second, although some new equipment families have entered the inventories of some sample countries in the latter part of the measurement period, they are present only exist in limited numbers. The two new models, South Korea's K2 and the US's M1 Abrams, are fielded only by Poland, and (for the moment) only in small numbers.

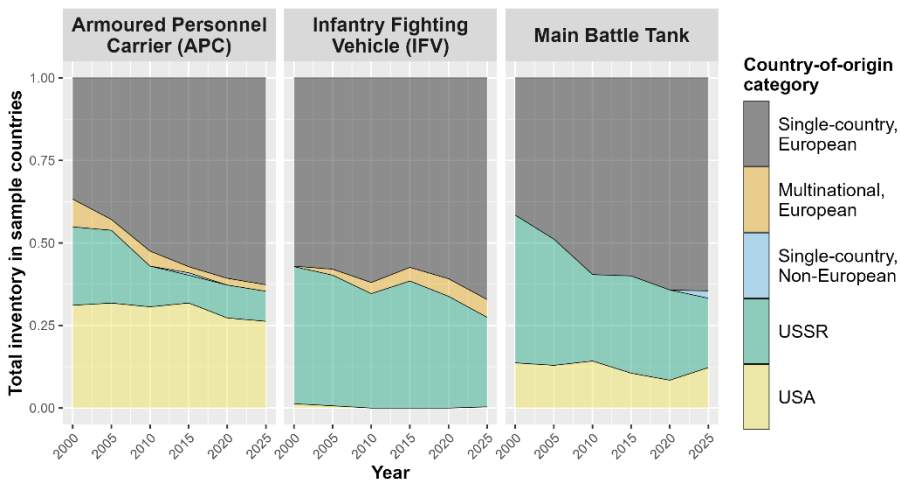

Figure 11: Ground systems for manoeuvre units as share of total European (EU+UK+NOR) inventory, 2000–2025. Systems are divided into categories based on national origin, with "European" denoting countries that are part of the sample (EU+UK+NOR).

Figure 11 above shows the share of stocks of APCs, IFVs and MBTs, divided into categories based on place of origin. For APCs and IFVs, there is some level of multinational cooperation, with the share of stocks of European origin increasing over time. The US is the leading non-European supplier of APCs, while the former USSR remains the largest supplier of IFVs.

For MBTs, the share of European-origin stocks is also rising over time, but there are no multinationally developed tanks in European inventories. This is, to some extent, an artefact of how one chooses to define multinational cooperation. The case could be made that the various T-72 derivatives in service in, e.g., Poland and Czechia, which have been upgraded locally over time, are the result of some level

of multinational cooperation. However, the PT-91 (for example), is not the result of a joint Polish-Soviet (or Polish-Russian) development project, but rather a case of Poland upgrading its own tanks that were developed in the USSR.

Not shown in figure 11 is the development of the total stocks. While APCs and IFVs show a similar pattern of increased European share of stocks, the total inventories are shrinking more rapidly on the APC than on the IFV side, which may reflect a heightened emphasis on more qualified mechanised units mounted in more expensive and capable vehicles.

4.2.2 Indirect fires

This section examines three classes of systems for indirect fires: towed artillery, self-propelled artillery, and rocket artillery.

Mortars, even self-propelled mortars, as well as dedicated ballistic missile systems, have been excluded.

4.2.2.1 Towed artillery

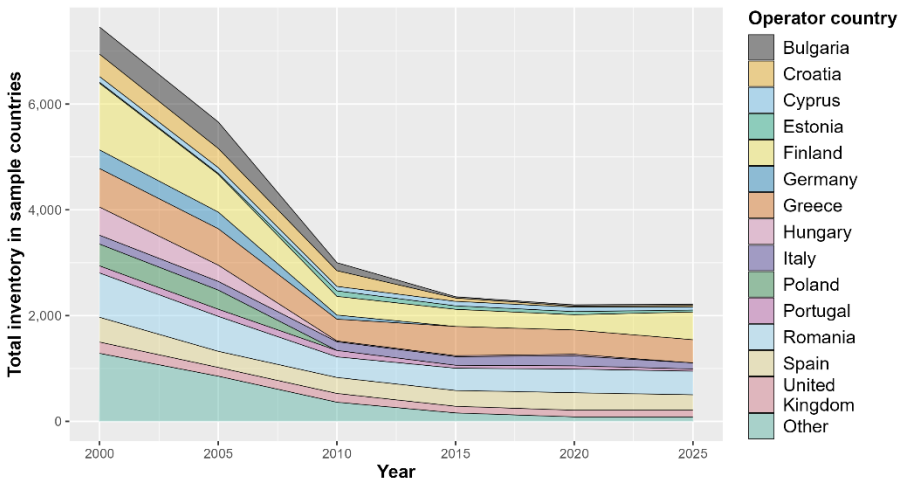

Figure 12: Towed artillery, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries with the 8 largest total stocks of towed artillery in any of the sample periods; all other countries are collapsed into “Other.”

Towed artillery is here defined as all tube artillery pieces that cannot move by their own power, and must be towed by a truck or utility vehicle. The actual gun is evidently as easy or complicated to design and manufacture as *the equivalent* self-propelled piece, but in order to take full advantage of a self-propelled piece, the system needs either an enclosed turret or an autoloader, and preferably some level of armour. This all adds complexity, and thus limits the countries that can, and choose to, manufacture and design them.

As can be seen in Figure 12 (previous page), in 2000, there were 7,500 pieces of towed artillery in the combined European inventory. These pieces represented 29 distinct equipment design families, and were in service across 26 different countries in the sample. In 2025, the equivalent figures were 2,200 pieces across 16 countries, representing 15 design families. As the next section describes, the countries that have stopped using towed artillery have not entirely divested their indirect fires capabilities, but rather moved towards self-propelled systems.

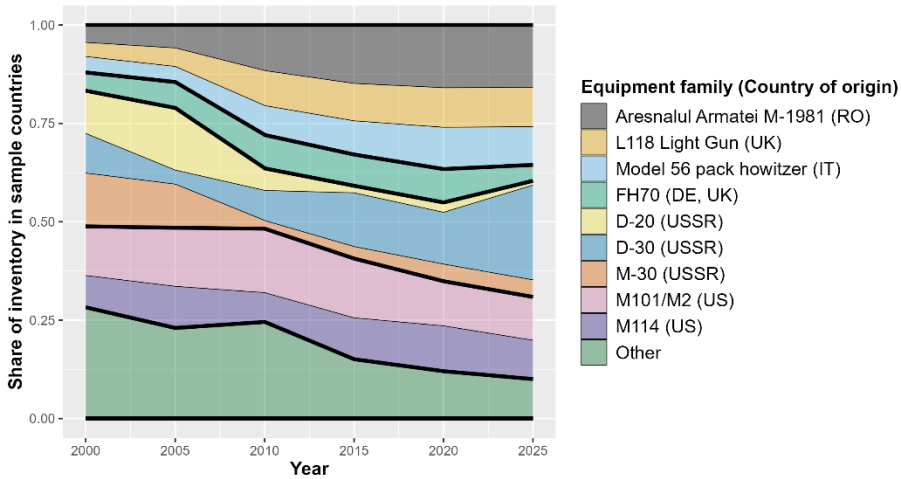

Figure 13: Towed artillery, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most common design families in any of the measurement periods; all other design families are collapsed into “Other.” The thick lines divide nation-of-origin categories (single-country European, multinational European, USSR, US). Nation-of-origin category for design families in “Other” not shown.

The leading self-propelled artillery developers are the USSR and the US. In the beginning of the measurement period, 40% of towed artillery pieces were of Soviet design. This number dropped to just shy of 30% in 2025. The US is the second most prominent producer, with around 20% of pieces being American throughout the measurement period. The three European-made models in Figure 13 are all light pieces, in service either with line units in small or light overall forces (e.g., Ireland) or as the main indirect fire system for light or specialised units in larger countries (such as with British or Spanish marines). As such, these systems find their niche even as heavier towed artillery systems are divested in favour of self-propelled systems in most line units.

As with APCs, there is no clear trend towards a unifying system, and as more countries move in the direction of self-propelled artillery systems, a future development in that vein seems unlikely.

4.2.2.2 Self-propelled artillery

Self-propelled artillery is any long-range indirect fire system where the gun unit can move on its own, as opposed to being towed by a secondary vehicle. Self-propelled artillery has the advantage of being quicker to relocate after firing, and in many cases can provide shrapnel and/or NBC protection to the crew. On many models, the crew can reload under cover, either by the breech being accessible from the crew compartment, or by means of an autoloader.

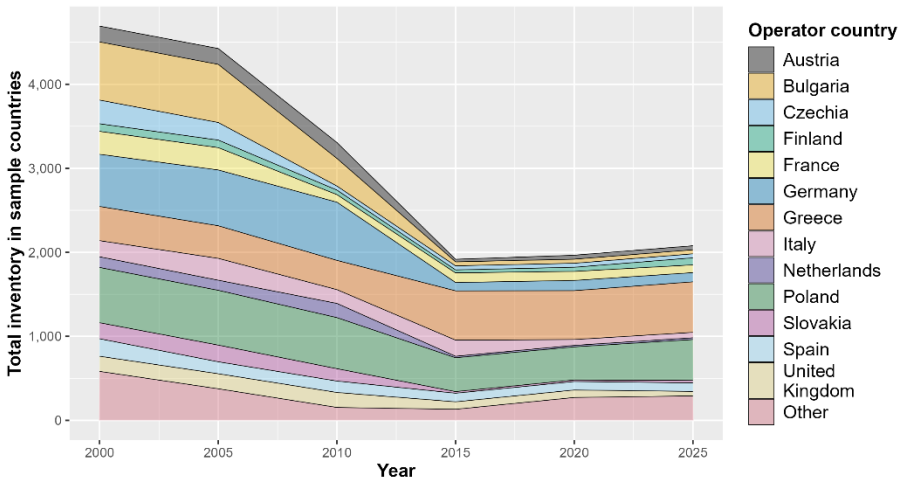

Figure 14: Self-propelled artillery, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of self-propelled artillery in any of the sample periods; all other countries are collapsed into “Other.”

There were just shy of 4,700 self-propelled artillery pieces in inventory in 2000, in 22 countries, spread across 16 design families. By 2025, the total number had reduced to 2,100 units, but the number of operator countries had increased to 24. The number of equipment design families in use was still 16, but the composition of those 16 design families had changed in the interim.

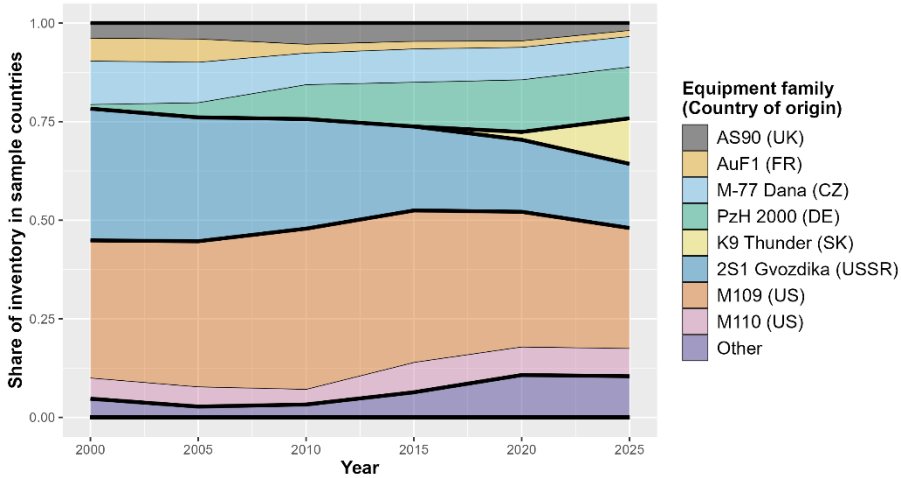

Figure 15: Self-propelled artillery, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into “Other.” The thick lines divide nation-of-origin categories (single-country European, single-country non-European, USSR, US). Nation-of-origin category for design families in “Other” not shown.

The US is the largest provider of self-propelled artillery pieces, with the Soviet Union lagging only slightly behind at the start of the study period. The main systems from the respective producers are the M109 for the US (35% of stocks across 10 countries in 2000), and the 2S1 Gvozdika for the USSR (33% of stocks across 8 countries in 2000). As the study period progresses, the lead of the M109 relative to the 2S1 increases, due to declining stocks of the 2S1 over time. In 2025, the 2S1 accounts for “merely” 16% of total stocks of self-propelled artillery (but retaining second place), while the M109’s share has dropped to 30%.

Since the early 2000s, the German PzH 2000 has grown steadily in share, becoming the third most common design family in 2025, accounting for 13% of total stocks. Since 2020, the Korean K9 Thunder, in use with Estonia, Finland, Norway, and Poland has increased sharply in popularity, from 0% pre-2020 to becoming the fourth most numerous design family in 2025.

As with tanks, France designs and produces its own artillery pieces. The AuF1, visible in Figure 15, was in the top 6 most prolific systems in the early years of the measurement period, but has since largely been divested in favour of CAESAR and Mk F3, both grouped under the “Other” category. These newer French systems have seen some export success within Europe, with Cyprus fielding the Mk F3 and Denmark briefly fielding the CAESAR during a brief period between the 2020 and 2025 measurements, before donating its entire stock of 19 units to Ukraine.

4.2.2.3 Multiple rocket launchers

Multiple rocket launchers are, as the term implies, artillery systems capable of firing a salvo of rockets before reloading. Some such systems are multi-calibre, capable of launching rockets of differing calibres, or guided ground-attack missiles.

There were just under 1,800 multiple rocket launchers in service in 2000, representing 7 design families across 17 countries. In 2025, the equivalent figures were 835 units, representing 8 design families across 15 countries.

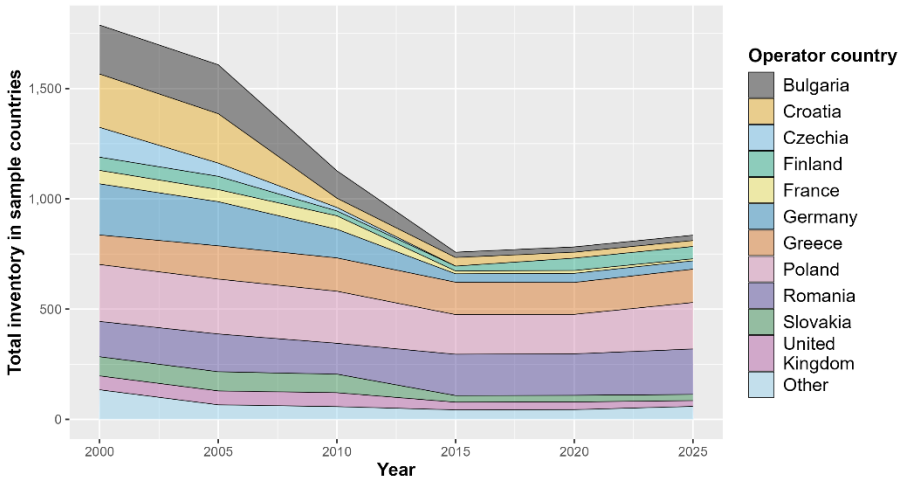

Figure 16: Multiple rocket launchers, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of multiple rocket launchers in any of the sample periods; all other countries are collapsed into "Other."

As can be seen in figure 17 on the next page, the Soviet-designed BM-21 Grad is the most numerous system throughout the measurement period, accounting for almost half (41%) of all rocket artillery units in use in 2000, decreasing by only a few percentage points to 38% in 2025. At the start of the period, the M270 was the second most numerous system, accounting for 20% of stocks. The Czech RM-70 overtook the MLRS in use in the latter half of the measurement period, making up 27% (against the MLRS' 18%) in 2025.

Compared to self-propelled artillery, the share of Soviet-origin systems is roughly constant across the measurement period. One explanation could be that the legacy stocks of BM-21s retained by former Warsaw Pact countries provide a cheap means to saturate an area with non-precise indirect fires, while Western-made alternatives are simply prohibitively expensive compared to the Soviet stocks already on hand. This effect would be especially strong if significant stocks of munitions are kept on hand or if local production chains are set up to produce BM-21 ammunition.

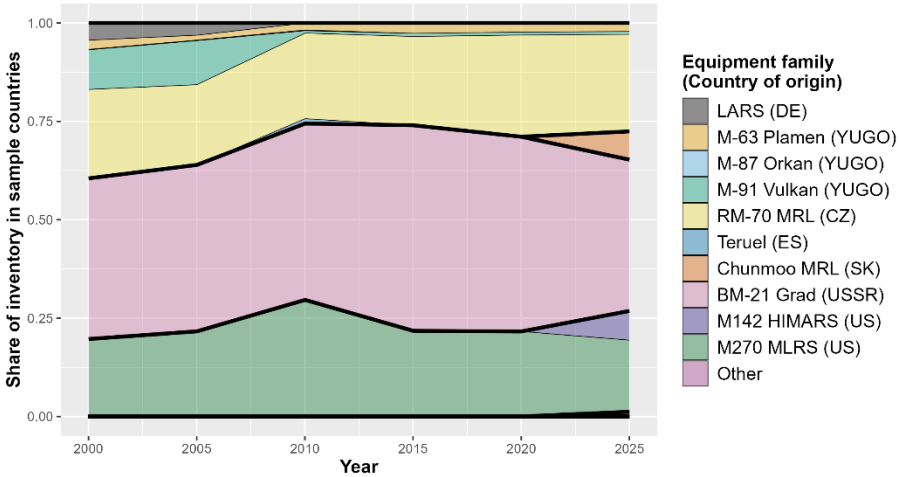

Figure 17: Multiple rocket launchers, design families as a share of total European (EU+UK+ NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, single-country non-European, USSR, US). Nation-of-origin category for design families in "Other" not shown.

4.2.2.4 Integration of indirect fires systems

Throughout the measurement period, stocks of all indirect fire systems have been reduced. Towed howitzers, being by far the most common type of indirect fires system at the start of the measurement period, have been reduced the most in inventory size. In 2025, the total stocks of towed and self-propelled howitzers were near parity, implying a general move from towed to self-propelled guns.

Table 4. Summary statistics for indirect fires systems

Equipment class	**Year**	**Total stocks**	**Operator countries**	**Systems**	**Systems per country**
Towed howitzers	2000	7,458	26	29	1.12
	2025	2,217	16	15	0.94
Self-propelled howitzers	2000	4,693	22	16	0.73
	2025	2,078	24	16	0.67
MRL	2000	1,788	17	7	0.41
	2025	835	15	8	0.53

The number of countries operating *any* towed gun has dropped from 26 to 16 throughout the measurement period, which makes the decrease in distinct systems per operator country (from 1.12 to 0.94) all the more stark. The number of countries operating self-propelled howitzers has increased from 22 to 24 during the same period.

Figure 18 below contextualises these figures in terms of the market concentration of the systems in use. This figure shows an increase in market concentration for towed artillery, while self-propelled guns and multiple rocket launchers are becoming more diversified (or less integrated) over time.

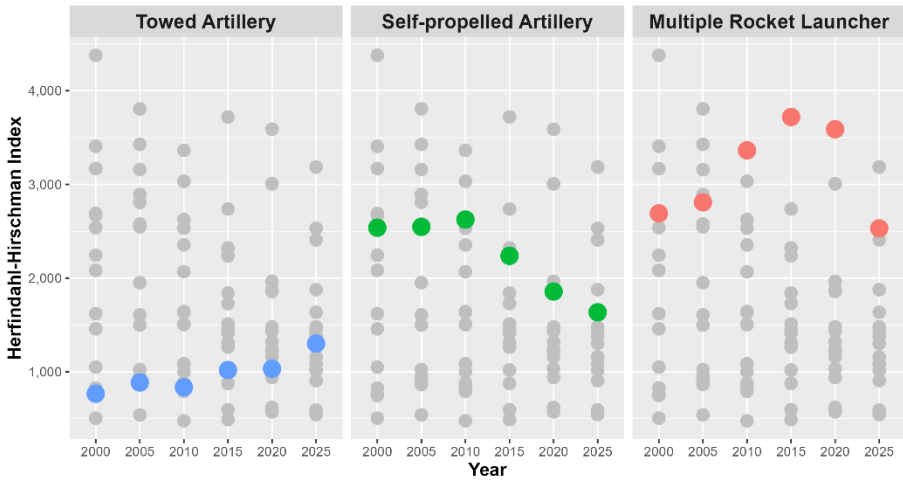

Figure 18: Herfindahl-Hirschman indices for ground systems for indirect fires (towed artillery, self-propelled artillery, multiple rocket launchers), 2000–2025. The colour-coded dots represent the equipment class in question, while the greyed-out dots represent all equipment classes in the study.

The reason for these developments differs from class to class. Towed artillery has moved towards increased integration as measured by the HHI as older towed systems have been divested and stocks of towed artillery have decreased in favour of self-propelled artillery; the driver of the rising HHI rising is simply that fewer different models are being kept in inventory (29 equipment design families in 2000 versus 16 in 2025).

On the self-propelled side, the level of integration has fallen over time as countries have moved away from the dominant legacy systems: 2S1 and (to a lesser extent) M109. While the M109 and 2S1 are still the most widely fielded self-propelled systems, the PzH 2000 has slowly been gaining market share across the measurement period due to its adoption by several countries, while the K9 has seen its share skyrocket in the last measurement period due to major procurements by Poland. On the multiple rocket launcher side, small but significant market share accruing to the HIMARS and Chunmoo serves to drive the HHI downwards.

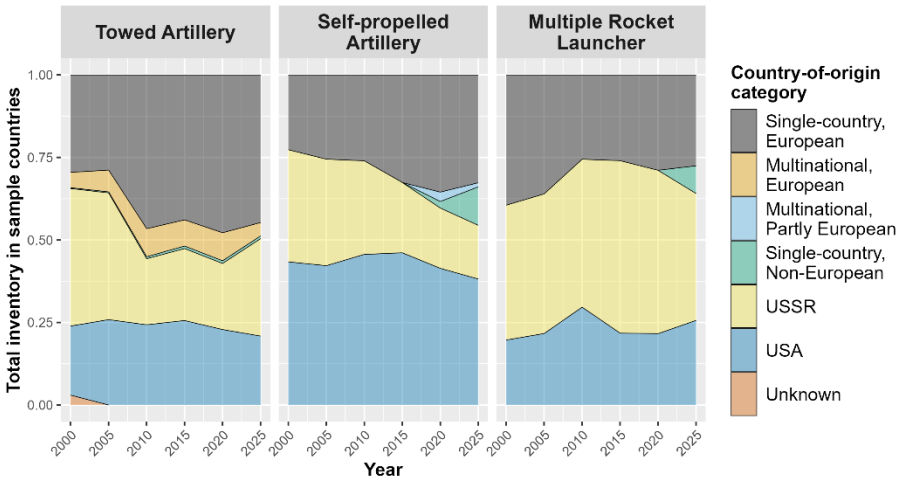

Figure 19: Systems for indirect fires as a share of total European (EU+UK+NOR) inventory, 2000–2025. Systems are divided into categories based on national origin, with "European" denoting countries that are part of the sample (EU+UK+NOR).

Figure 19 above shows the share of indirect fires systems according to country of origin. The share of European systems has increased over time for towed and self-propelled artillery, while it has decreased for rocket artillery. The share of US-made systems is decreasing in both classes of tube artillery.

On the towed side, this is largely driven by the countries operating US-made towed howitzers shifting towards self-propelled systems to a larger extent, while countries that inherited Soviet-made towed guns tend to keep them in stock to a greater degree. There are also small but significant shares of legacy (WWII-era) US-made towed guns at the start of the measurement period, which are completely divested by 2025. On the self-propelled side, the US-made M109 Paladin has been losing market share primarily to the PzH2000.

There are few multinational developments among indirect fires systems. On the towed side, the joint British-German FH70 saw widespread adoption early in the measurement period, but, in 2025, remains in service only with Italy. The constant market share is an artefact of the rapid divestment of towed pieces as a whole. The only multinational self-propelled howitzer is the AHS Krab, a Polish-designed derivative of the British AS90 and Korean K9.[70]

Like tube artillery, rocket artillery systems come from single-country development projects. The M270 MLRS can be argued, in some sense, to be the result of international cooperation, involving some degree of cooperation from the UK, France,

[70] Technology.org (2023).

and (West) Germany, although the final bid was won by Vought, an American company.[71]

4.3 Air systems

The air systems in this section are divided into four classes: two classes of combat aircraft (airplanes and helicopters), and two classes of transport or utility aircraft (again divided into planes and helicopters).

4.3.1 Combat Aircraft

4.3.1.1 Fixed-wing Combat Aircraft

Fixed-wing combat aircraft, or multirole combat aircraft, refers to all fixed-wing aircraft (airplanes) that are purpose-built for combat, including pure fighter and attack roles. There are no strategic bombers in the European inventory in any of the studied periods.

Multirole combat aircraft are extremely expensive to develop, and as the level of sophistication rises, require more and more specialised industry. Even in countries where aircraft can be designed and manufactured domestically, components (engines, sensors, and weapons) are often imported. Due to combat aircraft being difficult and expensive to develop, this market segment has historically seen high levels of multilateral cooperation, with the Panavia Tornado and Eurofighter Typhoon being notable European examples.

[71] Warfare History Network (2018).

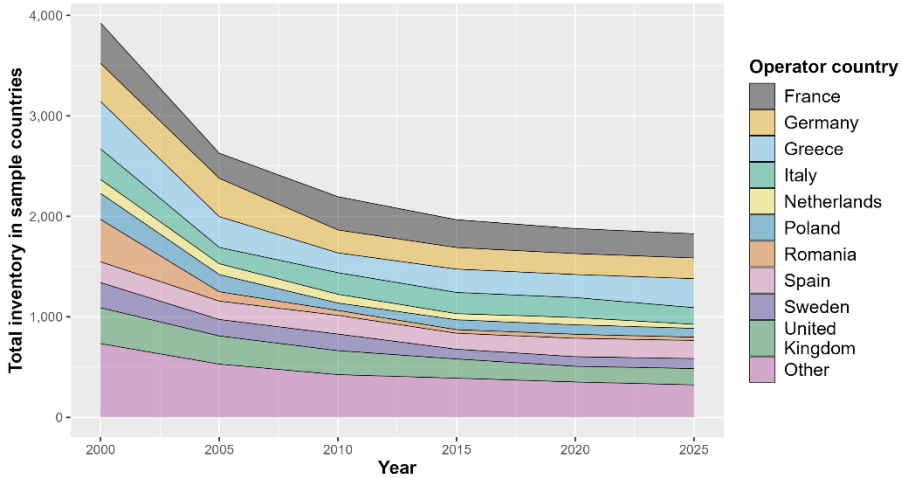

Figure 20: Fixed-wing combat aircraft: Total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of fixed-wing combat aircraft in any of the sample periods; all other countries are collapsed into "Other."

There were 3,900 fixed-wing combat aircraft in the combined inventories of the sample countries in 2000, which decreased to 1,800 airframes by 2025. From a high of 24 different equipment families in 2000, the combat aircraft inventory in 2025 had shrunk to 16 different families. 21 countries kept some number of combat aircraft in inventory throughout the period.

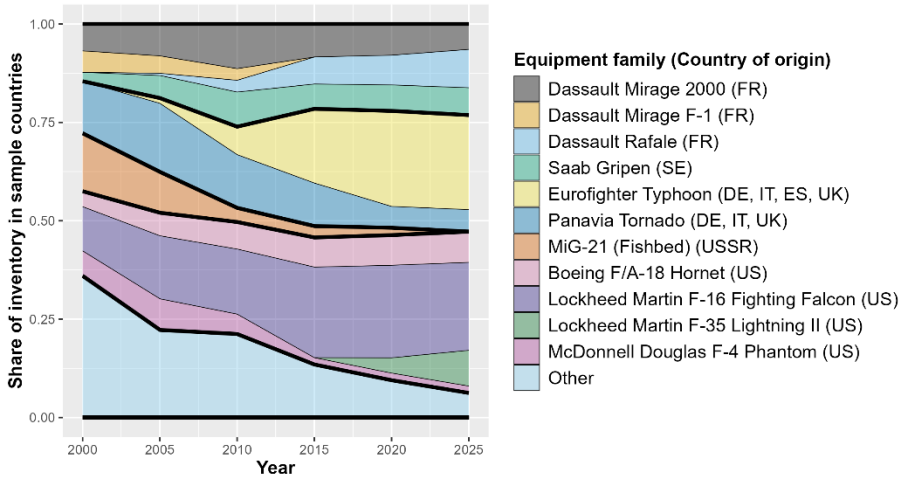

Figure 21: Fixed-wing combat aircraft, design families as a share of total European (EU + UK+ NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European, USSR, US). Nation-of-origin category for design families in "Other" not shown.

Contrary to land systems, where legacy Soviet systems are still in use in Eastern Europe, the old Soviet stocks of MiG and Sukhoi models are almost entirely phased out. The MiG-21 was the most common airframe at the start of the studied period, but was completely phased out by 2025. MiG-29s, hidden in the "Other" category, are still in limited use in a few countries, but parts of these stocks, specifically from Poland and Slovakia, have been donated to Ukraine[72].

Jointly developed European systems are popular throughout the measurement period. The Panavia Tornado achieved a maximum market share of 17 per cent in 2005, and has steadily been surpassed by the Eurofighter Typhoon, which commands a 24 per cent market share in 2025.

The American systems made up a combined 30% of stocks in 2000, which increased to 41% in 2025 as other systems were divested. The F-16, operated by 7 countries in 2025, is the most popular American design family, accounting for 11% of total stocks in 2000 and 22% in 2025. The "Other" category hides four additional American systems; A-7 Corsair, F-104, F-5 and the joint British-American Harrier. The market share of the F-35 has been increasing since the middle of the measurement period, and deliveries are still ongoing.

After the US, France is the largest producer, meeting both domestic needs as well as some exports to other European countries. France's three models in the sample are the Mirage F1 and Mirage 2000, with the newer Rafale replacing the two Mirage models over time. In the latest sample period, France still operates all three aircraft, but more than half of their inventory consists of Rafales. All three aircraft have met with some export success within Europe, with Greece operating Mirage 2000s, Spain having operated a fleet of Mirage F1s, and Croatia recently receiving their first six Rafales.

4.3.1.2 Rotary-Wing Combat Aircraft

Rotary-wing combat aircraft, or attack helicopters, are defined here as helicopters that are purpose-built for combat missions. Such vehicles carry a turret-mounted machinegun or autocannon, with the ability to carry additional weapons, such as rockets, anti-tank guided missiles, or short-range anti-air missiles, on wing- or fuselage-mounted pylons.

"Purpose-built" does the heavy lifting in the previous paragraph; this section does not concern multirole helicopters fitted with ATGMs, such as the Bo-105s, AH Lynx, and Gazelles in service in the anti-tank helicopter role in the early part of the measurement period, since these are not readily comparable in either role, manufacturing complexity or cost to the purpose-built systems discussed here. The case can be made for either including or excluding the earlier ATGM-carrier helicopters. On the one hand, these systems did function as attack helicopters, at least

[72] Le Monde (2023).

in the anti-tank role. On the other hand, no countries in the sample currently operate such systems; if the purpose is to analyse trends, including a class of equipment systems that is no longer in use would be counterproductive. For completeness's sake, an analysis including ATGM helicopters has been performed where relevant.

In 2000, 8 countries operated a total of 264 purpose-built attack helicopters across three different equipment families (the Eurocopter Tigre had not been delivered yet). In 2025, 11 countries operate a total of 309 attack helicopters across 5 families.

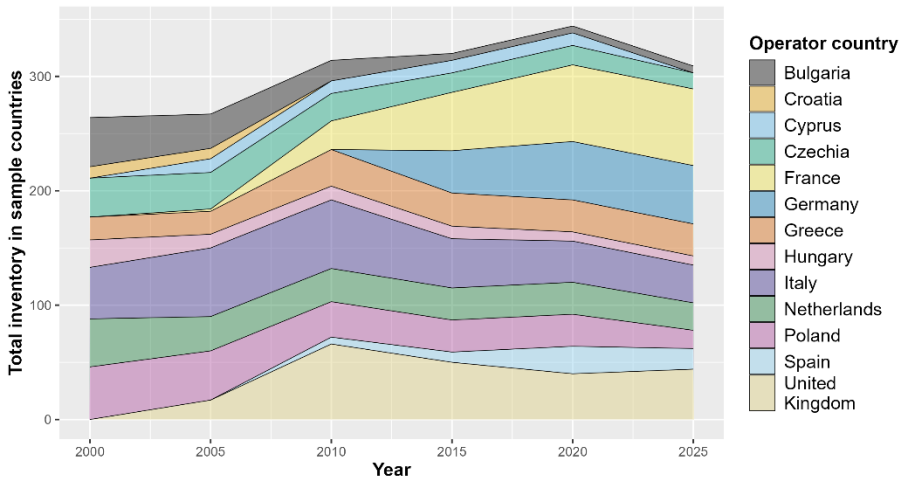

Figure 22: Purpose-built attack helicopters, total European (EU+UK+NOR) stocks by operator country (2000–2025).

The time series of total stocks shown in Figure 22 above stands out from most other equipment classes in that it is increasing over time. This is due to the fact that larger countries in Western Europe generally operate lighter ATGM-carrying helicopters in the earlier part of the measurement period. Figure 23 below shows a similar figure, but with ATGM helicopters included.

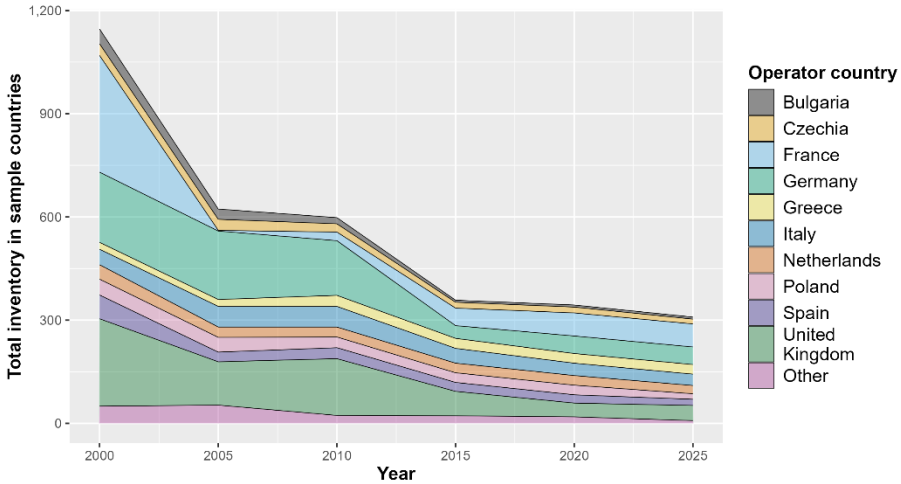

Figure 23: All combat-capable helicopters (attack helicopters + ATGM helicopters), total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of combat-capable helicopters in any of the sample periods; all other countries are collapsed into "Other."

In other words, the stock of *all combat-capable helicopters* has decreased, while the stock of *purpose-built attack helicopters* has increased.

The illustration below, Figure 24, of the share of inventory stocks for the different helicopter-design families is based only on purpose-built attack helicopters.

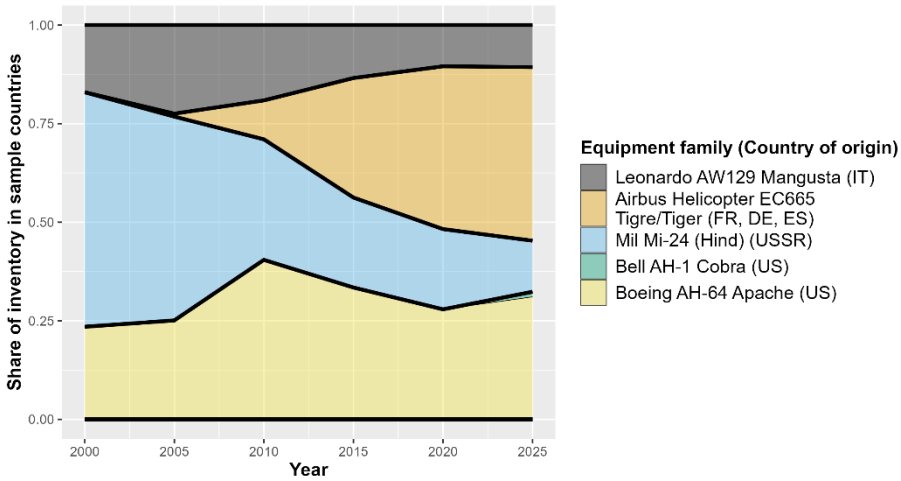

Figure 24: Purpose-built attack helicopters, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods." The thick lines divide nation-of-origin categories (single-country European, multinational European, USSR, and US).

The two main trends visible in Figure 24 above are the sharp decrease in stocks of Mi-24s, and what at least looks like a substitution away from Mi-24s in favour of the Eurocopter (now Airbus Helicopter) Tigres. Looks can be (and in this case, are) deceiving, as these are two separate effects. The divesting of stocks of Mi-24s is underway in Eastern European countries, while the build-up of Tigres has taken place in France, Spain, and Germany.

In Western and Central Europe, only a few countries maintain fleets of attack helicopters, with only three models in service apart from the legacy Mi-24s of Eastern Europe; the A129 Mangusta in service with Italy; the AH-64D/E Apache in service with the UK, Netherlands, and Greece; and the Eurocopter Tigre/Tiger in service with Germany, France, and Spain. For all three Eurocopter contributors, the Tigre has been replacing earlier ATGM-armed light helicopters, such as the Bo-105s previously in service with Germany and Spain, or the ATGM-armed Gazelles previously in service with France.

The Tiger is the only attack helicopter produced through multilateral cooperation, being jointly developed and produced by Germany, France, and Spain. The stocks of Tigers are increasing, unlike all other attack helicopters in the sample, rising from 0% in 2005 to roughly half of extant stocks in 2024. The stock of Mi-24s is decreasing, as noted, as is the stock of Mangustas, while the stock of Apaches has remained fairly constant over time.

4.3.1.3 Integration of combat aircraft

Table 5 below presents summary statistics for the two classes of combat aircraft considered in this study. All measures have moved in opposite directions when comparing fixed- and rotary-wing combat aircraft. For fixed-wing aircraft, the number of systems has decreased, as has the number of systems per country. Total stocks have fallen by around half. The only measure not to have fallen is the number of operator countries, which has remained at 21. On the rotary-wing side, the number of airframes has increased, as have the number of operator countries, the number of systems, and systems per country.

Table 5. Summary statistics for combat aircraft

Equipment class	**Year**	**Total stocks**	**Operator countries**	**Systems**	**Systems per country**
Fixed-wing	2000	3,924	21	24	1.14
	2025	1,827	21	16	0.76
Rotary-wing	2000	264	8	3	0.38
	2025	309	11	5	0.45

Fixed-wing combat aircraft have grown more integrated as measured by systems per country, while attack helicopters have grown (slightly) less integrated. This picture is reinforced by the Herfindahl-Hirschman indices in Figure 24 below,

which show a decrease in fragmentation for airplanes and an increase in fragmentation for helicopters. The trend for helicopters seems to be reversing in the latter three measurement periods, however.

On the fixed-wing side, there are factors forcing the HHI both up and down. In the latter half of the measurement period, the F-16 and Eurofighter have increased sharply in market share, driving the HHI upwards. At the same time, legacy airframes, not only of Soviet manufacture, have been divested, which also pushes the HHI up. In two significant cases, there has been a shift from one older model to a newer one (from the Mirage F-1 to the Rafale, and from the Panavia Tornado to the Eurofighter). This exerted a downward effect on the HHI in the middle of the measurement period. If a similar shift materialises with the F-35, it would also have a temporary downward effect on the HHI, and thus on our measure of integration.

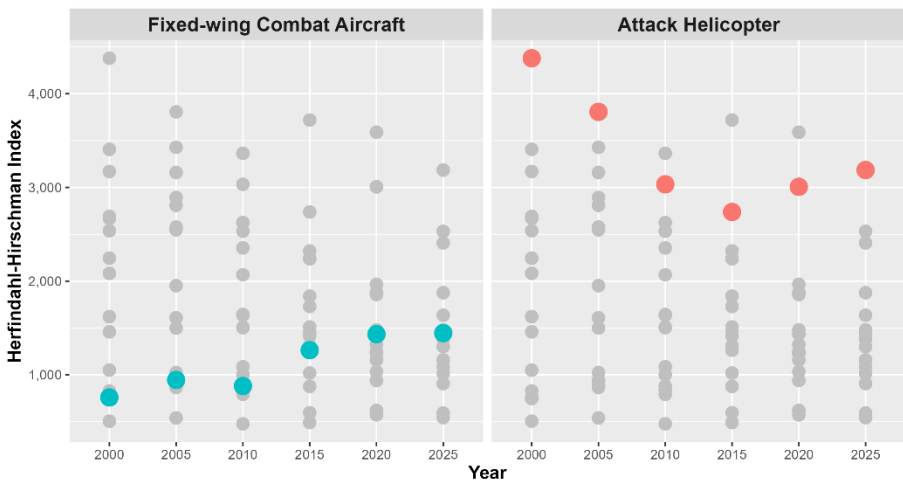

Figure 25: Herfindahl-Hirschman indices for combat-capable air systems (fixed-wing and rotary-wing combat aircraft), 2000–2025. The colour-coded dots represent the equipment class in question, while the greyed-out dots represent all equipment classes in the study.

The stocks of both fixed-wing and rotary-wing combat aircraft are characterised by a relatively high degree of bilateral or multilateral cooperation within Europe. On the fixed-wing side, the Jaguar, Tornado, and Eurofighter initiatives have more or less succeeded one another over time, with the Eurofighter currently being the most numerous airframe in the European inventory. On the attack helicopter side, the Eurocopter Tiger/Tigre has been increasing in market share since its introduction.

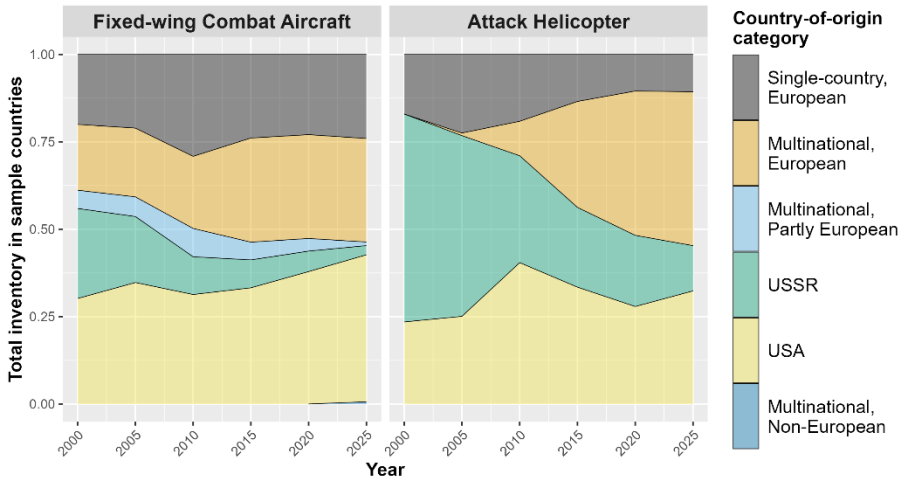

Figure 26: Combat-capable air systems (fixed-wing and rotary-wing) as share of total European (EU+UK+NOR) inventory, 2000–2025. Systems are divided into categories based on national origin, with "European" denoting countries that are part of the sample (EU+UK+NOR).

The two striking trends in Figure 26 above are the large (and increasing) market share of multinational European systems, and the divestment of Soviet systems.

The explanation is that smaller countries tend to purchase off-the-shelf combat aircraft from the US or France. While the Eurofighter has seen *some* export success (being exported to Austria), its main users are still its countries of manufacture: the UK, Germany, Italy, and Spain.[73] The Typhoon represents the largest share of the multirole aircraft produced by these countries in the sample.

The UK has previously cooperated with the US in developing and manufacturing the Harrier, operated by Italy and Spain (as of 2025), and has also cooperated with France in producing the SEPCAT Jaguar, no longer in service with any European nation. The "Multinational, Partly European" category contains the UK–US Harrier and the Italian–Brazilian AMX.

4.4 Transport aircraft

4.4.1.1 Fixed-wing tanker and transport aircraft

The transport aircraft considered in this section are those capable of carrying at least several platoons' worth of personnel. To varying extents, some such aircraft can also carry cargo, while others are essentially civilian airliners operated by a nation's air force or equivalent. Tanker aircraft are used for aerial refuelling. Some

[73] The UK, Italy, and Germany had previously cooperated on the Tornado.

aircraft can be configured for both roles (e.g., A310 MRTT), so all tankers and transport aircraft are analysed together.

The aircraft under consideration in this section are those that IISS classifies as medium or heavy transport aircraft, as composite tanker/transport aircraft, or as passenger transport aircraft. The Gulfstream and Falcon families of aircraft kept in inventory by many sample countries for VIP, liaison, or light personnel transport are excluded due to their being too small to be comparable to the other airframes in the sample.

Further, aircraft are included only to the extent that they are counted as being operated by one of the sample countries according to IISS, which means that aircraft operated jointly by NATO member states in the MMF (Multinational Multi-Role Tanker Transport Fleet), SAC (Strategic Airlift Capacity) and SALIS (Strategic Airlift International Solution) programmes are excluded. This means that the following analysis underestimates Europe's combined transport and tanker capacity by 15 aircraft in the latter measurement periods.

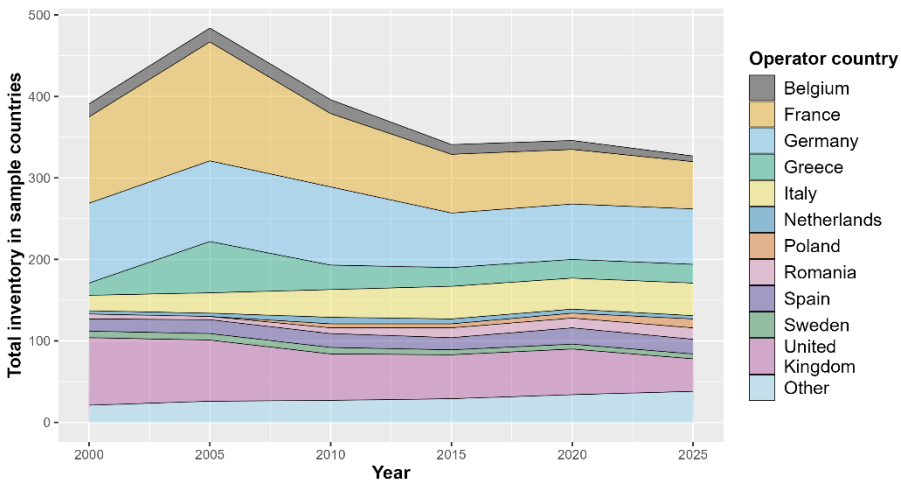

Figure 27: Fixed wing transport and tanker aircraft: Total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of transport aircraft in any of the sample periods; all other countries are collapsed into "Other."

In 2000, a total of 391 transport and tanker aircraft were operated by 14 countries, spread across 11 equipment families. This number increased sharply to 484 in 2005, then gradually decreased to 327 in 2025. The number of countries operating fixed-wing transport/tanker aircraft increased to 22 in 2025, now spread across 14 different equipment families.

The C-130 Hercules was the most common airframe in 2000, and again in 2015–2020, with the Franco–German Transall C-160 being the most prolific in 2005–2010.

Since 2015, the Airbus A400M has been increasing its market share, becoming the most common airframe in 2025, with the A400M fleets of Germany, France, the UK, and Spain (and to a lesser extent, Belgium) accounting for 35% of fixed-wing transport aircraft in the European inventory.

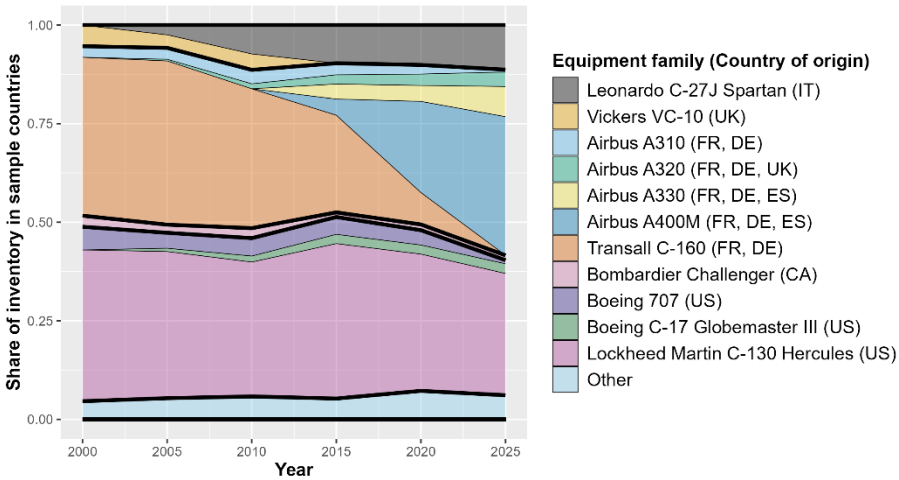

Figure 28: Fixed-wing transport and tanker aircraft, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are among the 6 most prolific in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European, single-country non-European, US). Nation-of-origin category for design families in "Other" not shown.

As with attack helicopters discussed in Section 4.3.1.2 above, changing trends in the type of systems in use complicate the analysis. The holdover legacy transport aircraft used by former Warsaw Pact countries are, to a large extent, smaller than the aircraft in use with Western and Central European nations.

This means that no Soviet airframes are visible in Figure 28 above. The majority of Soviet-origin aircraft are too small to be included, and while the larger models (Tu-134s and Tu-154s operated by Bulgaria and Czechia in the early years of the period) are not excluded, their numbers are too small to be visible and are therefore collapsed into the "Other" category.

While legacy Soviet transport airplanes have generally been divested, they have not necessarily been substantially replaced by larger Western airframes, with countries instead opting either not to maintain fixed-wing airlift capabilities or to rely on allies or partner nations for such capabilities.

A similar effect can be seen (or, more precisely, not seen, as the case may be) among Western European countries. Significant numbers of light transport aircraft are found in the inventories in the earlier years, which are being replaced over time

by larger airframes. This means that the low initial level in Figure 28 should not *necessarily* be taken to indicate that total airborne transport capacity was lower in 2000 than in 2005 (although, as the C-160s and C-130s are larger than the light transport aircraft they have been replacing, this is likely to be the case).

4.4.1.2 Transport and Multirole Helicopters

The helicopters discussed in this section are those that IISS classifies as transport, multirole, or search and rescue helicopters, regardless of size or capability. Since these airframes are largely modular, the same models are also used in anti-ship, anti-submarine, electronic warfare, or reconnaissance roles. Since these categories of helicopters are not included in the study, neither are multirole helicopters in non-transport roles. There is presumably some overlap between the different categories, which implies that some loss of detail is to be expected.

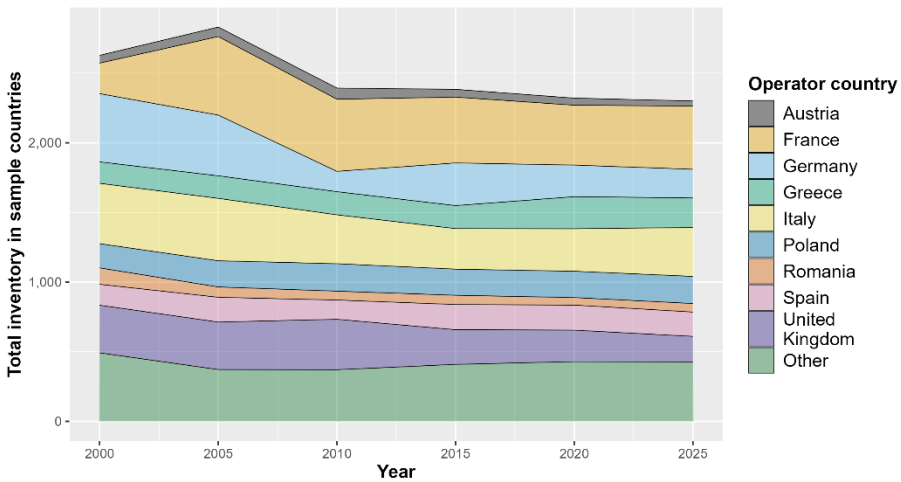

Figure 29: Transport and multirole helicopters: Total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of transport helicopters in any of the sample periods; all other countries are collapsed into "Other."

Transport helicopters are used in all but the very smallest of Europe's armed forces, being present in 26 sample countries in 2000 and in all countries by 2025. In 2000, the combined transport helicopter fleet amounted to 2,600 airframes, dropping only slightly to 2,300 in 2025. The number of equipment families increased from 24 to 35 in the same period. The Bell 204/205 (perhaps more recognisable by the US designation UH-1 Iroquois, or "Huey") was the most common airframe for all but the latest period, when it was overtaken by the NH-90. The Bell 204/205 was in service with 8 countries in 2025, down from a high of 13 countries in 2005, while the NH90 was in service with 8 countries in 2025.

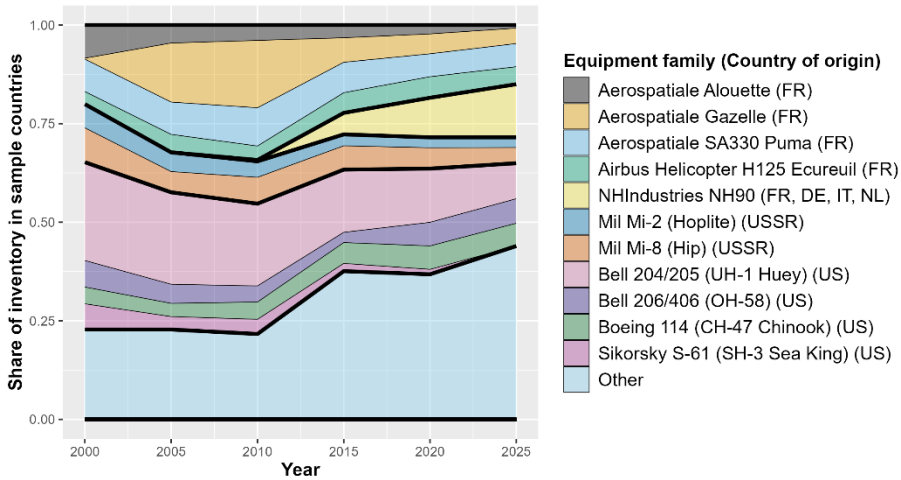

Figure 30: Transport and multirole helicopter, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European, USSR, US). Nation-of-origin category for design families in "Other" not shown.

The transport helicopter market is diversified in terms of equipment design families, with European-developed and produced helicopters making up a large share of both models and stocks. The large share of "Other," especially in the latter part of the measurement period, further indicates a highly diversified market.

France and the US are the two largest producers. The American helicopters in the sample are exclusively designed and manufactured domestically, while the European-designed helicopters largely involve some level of multinational cooperation. As opposed to attack helicopters, however, the transport helicopter market is not characterised by grand joint ventures, but rather by a single designer, such as Aérospatiale, Sud Aviation, or AgustaWestland, and manufacture by either the designer company or by partner companies in other European countries.

Compared to ground systems and attack helicopters, the initial share of Soviet equipment on the transport helicopter side is not as large as one might suspect, owing to the different mix-of-forces on the two sides of the Iron Curtain. While almost all former Warsaw-pact countries standardised on the BMP-1 as their IFV of choice, and almost all such countries placed significant emphasis on the ground domain, their inherited transport helicopter fleets were not standardised on a single model to the same degree, and tactical airlift capabilities were less emphasized. This resulted in a proportionately smaller share of Soviet-origin transport helicopters even in the beginning of the sample period.

4.4.1.3 Integration of transport aircraft

Across the measurement period, the number of operator countries, as well as the number of distinct equipment design families, for both classes of transport aircraft has increased. The number of systems per country has decreased for fixed-wing transport aircraft, while it has increased significantly for rotary-wing transport aircraft. As is seen below, these developments are also reflected in the market segment integration as measured by HHI.

Table 6. Summary statistics for transport aircraft

Equipment class	**Year**	**Total stocks**	**Operator countries**	**Systems**	**Systems per country**
Fixed-wing	2000	391	14	11	0.79
	2025	327	22	14	0.64
Rotary-wing	2000	2,628	26	24	0.92
	2025	2,300	29	35	1.21

The transport helicopter market segment is diversified, with many models in service across nearly all sample countries. Although the number of dominant manufacturers is relatively small, especially as consolidation has seen many helicopter manufacturers merging into ever larger conglomerates, these few manufacturers produce a wide range of models for varied purposes. While certain models are more popular than others, the end result is a low HHI, implying a consistently high degree of market fragmentation throughout the studied period.

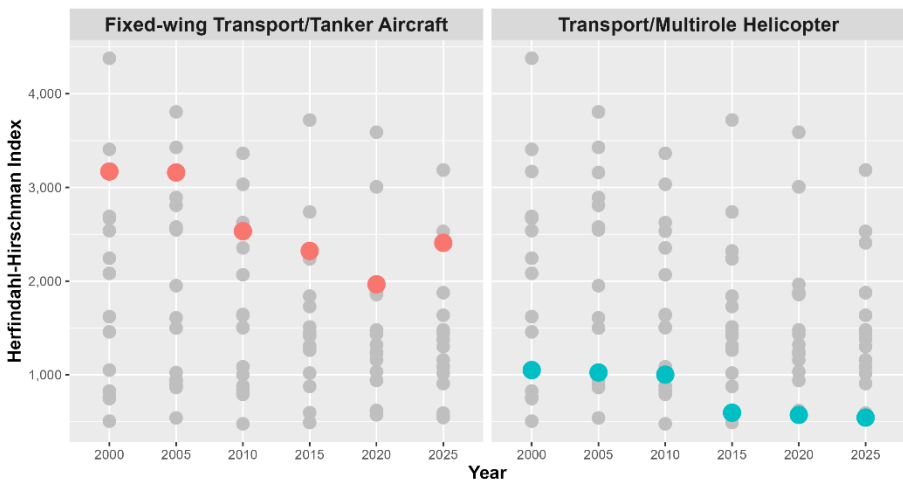

Figure 31: Herfindahl-Hirschman indices for transport aircraft (transport/tanker airplanes, transport/multirole helicopters), 2000–2025. The colour-coded dots represent the equipment class in question, while the greyed-out dots represent all equipment classes in the study.

The market for transport aircraft is less diversified, with a small number of producers producing a smaller number of competing airframes (although there is still variation in each manufacturer's catalogue).

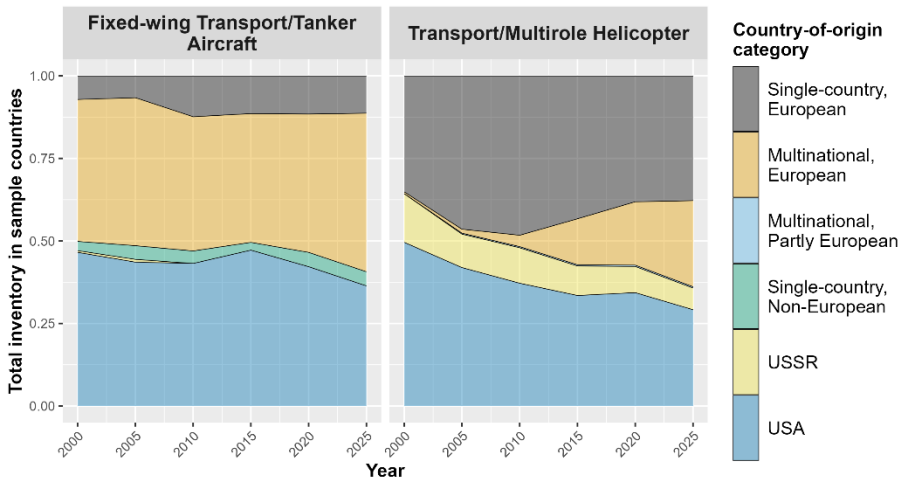

Figure 32: Transport aircraft (fixed-wing and rotary-wing) as share of total European (EU+UK+NOR) inventory, 2000–2025. Systems are divided into categories based on national origin, with "European" denoting countries that are part of the sample (EU+UK+NOR).

The transport and tanker aircraft market segment has the highest degree of international cooperation among all those described in this study. While not as high, the market share of multinational equipment design families in the transport helicopter segment has grown over time due to the widespread adoption of the NH90. The share of Soviet-manufactured systems is almost non-existent in the fixed-wing category, while small but significant numbers of primarily Mi-8s and Mi-2s remain in Eastern European inventories. The share of US-manufactured equipment has dropped slightly for both classes.

4.5 Maritime systems

Surface warships are generally divided into broad categories of hull types based on tonnage, capability, and role, with the main categories in use today being corvettes, frigates, destroyers, and cruisers, in ascending order of size and expense. These categories are not consistent over time or across nations. While, *in general*, a corvette is smaller than a frigate, which is smaller than a destroyer, the cut-offs are often fuzzy, and in some cases a ship designated as (for example) a destroyer by some country A may be larger and more heavily armed than a ship designated as a cruiser by some country B.

IISS has classified ships into size categories as described above, but uses objective criteria such as tonnage, capability, and speed, rather than the manufacturer's or

operator's designation. This provides a basis for comparison, albeit an imperfect one. As mentioned in Section 4.1.2, ships that were not in use in 2015 or later, and therefore were not included in the *Military Balance+* dataset, have been categorised by the author. The use of the IISS ship size classifications means that some ships may appear to be missing from the sample. For example, IISS classifies Norwegian corvettes as patrol craft, which thus excludes them.

This study uses the terms "small surface combatant" and "large surface combatant" regardless of whether the operator navy refers to the ships as corvettes, frigates, destroyers, or cruisers.

4.5.1.1 Small surface combatants

The majority of European navies do not operate large surface combatants in significant numbers, instead relying on frigates and corvettes. Drawing a sharp distinction between such ship size classes is always difficult.

Small surface combatants are among the most diverse equipment types in terms of producers. Some countries, such as Germany, the Netherlands, the UK, France, and Spain, are major producers, but even smaller countries are represented.

The market segment for small surface combatants consists of ships that IISS has categorised as corvettes and frigates. These ships generally carry at least an autocannon for close combat, as well as anti-ship missiles, anti-submarine grenade launchers, and, in some cases, torpedoes and/or anti-air missiles. Some also have hangars to accommodate one or two helicopters, often for anti-submarine warfare.

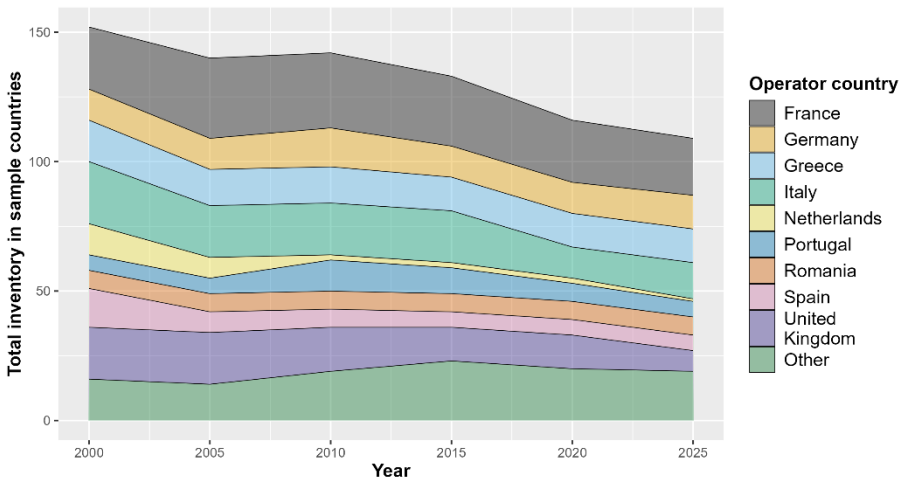

Figure 33: Small surface combatants, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of small surface combatants in any of the sample periods; all other countries are collapsed into "Other."

As seen in Figure 33 above, the total stock of small surface combatants declined from a high of 152 in the beginning of the studied period to a low of 109 at the end of the measurement period. 15 countries operated small surface combatants throughout the period, across 28 equipment design families in 2000, falling slightly to 25 families in 2025. France maintained the largest stock of small surface combatants throughout the studied period.

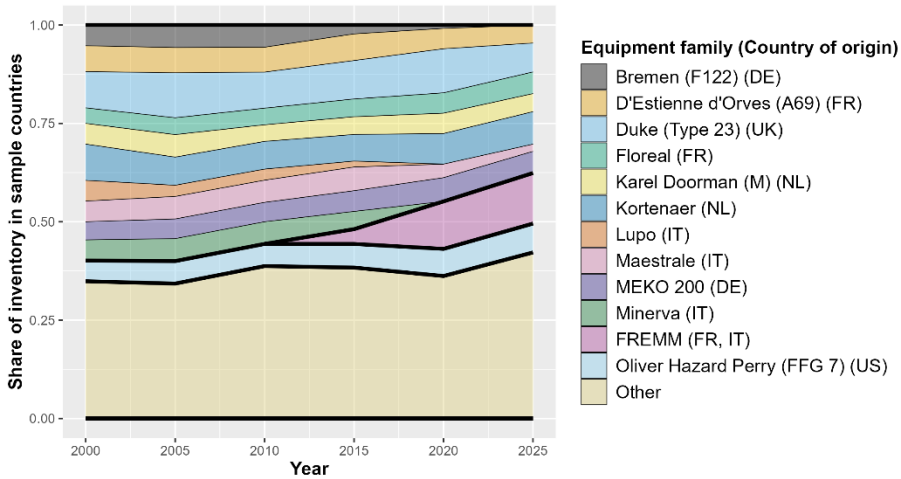

Figure 34: Small surface combatants, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into “Other.” The thick lines divide nation-of-origin categories (single-country European, multinational European, US). Nation-of-origin category for design families in “Other” not shown.

The market for small surface combatants is well diversified, as shown in Figure 34 above by the large share of “Other” equipment-design families.

The general trend, as with many other types of equipment, is that the larger countries satisfy the needs of their own navies with domestic production, while smaller countries tend to import. Unlike ground equipment, the Soviet heritage is largely absent at the macro scale. This is mainly due to the fact that the former members of the Warsaw Pact tend to have smaller navies than armies, and therefore to have fewer ships overall. Among the countries of Eastern Europe, legacy Soviet designs have remained in service throughout the studied period, but these are fewer in number than the models in use by the navies of Western Europe.

4.5.1.2 Large surface combatants

Due to the large variety of different ship classification schemes—a ship that is a frigate in one navy may be larger than a destroyer in another—the cut-off between

large and small surface combatants is, in some sense, arbitrary. The large surface combatants in this category are those ships that IISS classifies as destroyers or above, regardless of their domestic classification.

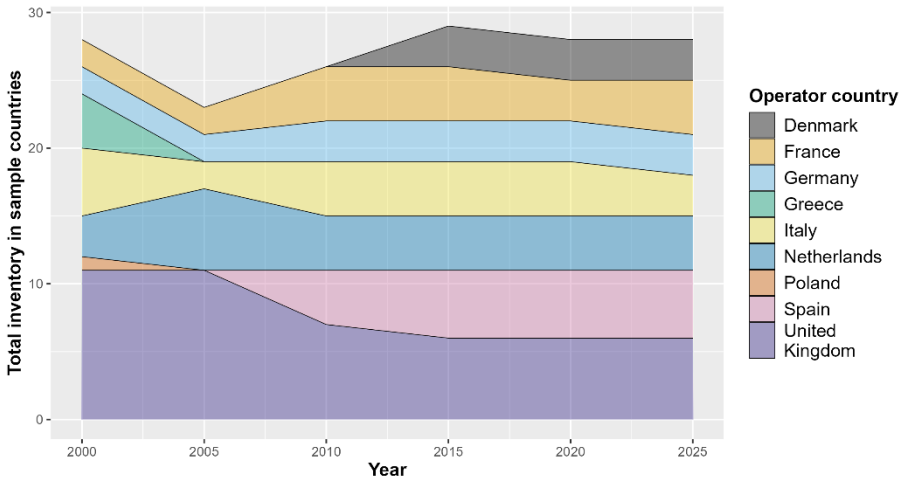

Figure 35: Large surface combatants, total European (EU+UK+NOR) stocks by operator country (2000–2025).

As seen in Figure 34 above, there were 28 large surface combatants in service in Europe at both the start and the end of the measurement period, with a low of 23 and a high of 29 in the interim. The UK maintained the largest inventory, ranging from 11 ships in 2000 to 6 ships in 2025, with the UK's Sheffield class being the most common design family in the first half of the measurement period and its Daring class the most common design in the latter half.

Figure 36 on the next page shows a breakdown of the equipment design families (ship classes) based on their share of total inventory. In general, the country that has produced a large surface combatant is also the country that fields it. The exceptions, apart from Italy and France jointly developing the FREMM and Horizon classes, are Germany's US-made Charles F Adams-class destroyers, decommissioned in 2003, and Poland's single Kashin-class destroyer, also decommissioned in the early 2000s.

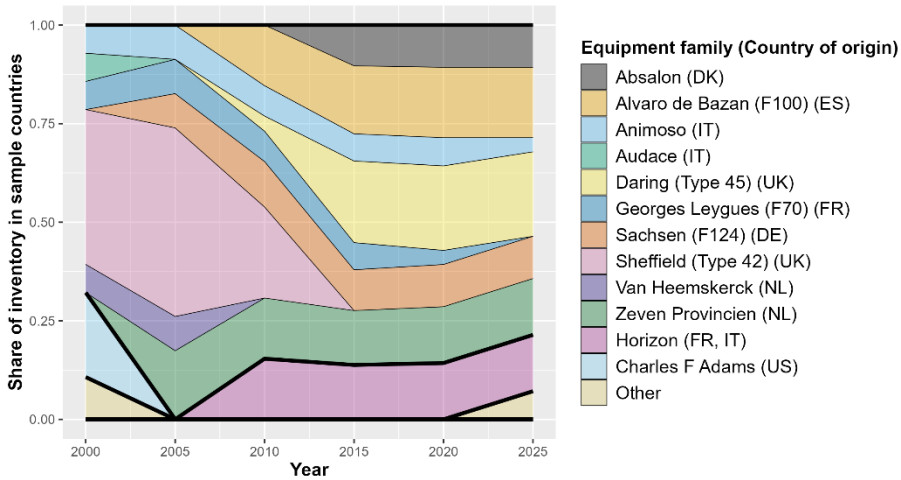

Figure 36: Large surface combatants, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families that are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European, US). Nation-of-origin category for design families in "Other" not shown.

4.5.1.3 Attack submarines

Attack submarines are those submarines whose primary mission set is fighting other submarines or surface targets, as opposed to submarines that are primarily part of a country's nuclear deterrence. A nuclear-*powered* submarine may still be an attack submarine, but such submarines are generally only operated by countries that also have a submarine arm of their nuclear deterrence. In the sample, only France and the UK operate nuclear-powered attack submarines, and both of these countries also operate nuclear-powered ballistic missile submarines.

14 European navies operate some number of tactical submarines, with Belgium, Lithuania, and Finland being the only nations that have some qualified surface combatants but lack submarines throughout the measurement period (Denmark operated submarines until 2004, but no longer do). As opposed to small surface combatants, the set of manufacturing countries is much smaller, with only countries having a large defence industrial base being able (or willing) to produce submarines. This is what one would intuitively expect: the distance between being able to produce civilian ships and being able to produce small surface combatants is smaller, especially when weapons and sensors can be imported, than the distance between producing civilian surface ships and producing submarines.

Figure 37 below visualises the stocks of attack submarines in European inventories. From 82 boats in service across 18 different equipment design families in 2000, the figure drops to 53 boats across 15 equipment design families in 2025.

German models were the most prolific across all periods, with the Type 206A and Type 209 being the most common in the first half of the measurement period, superseded by the Type 212A in 2020.

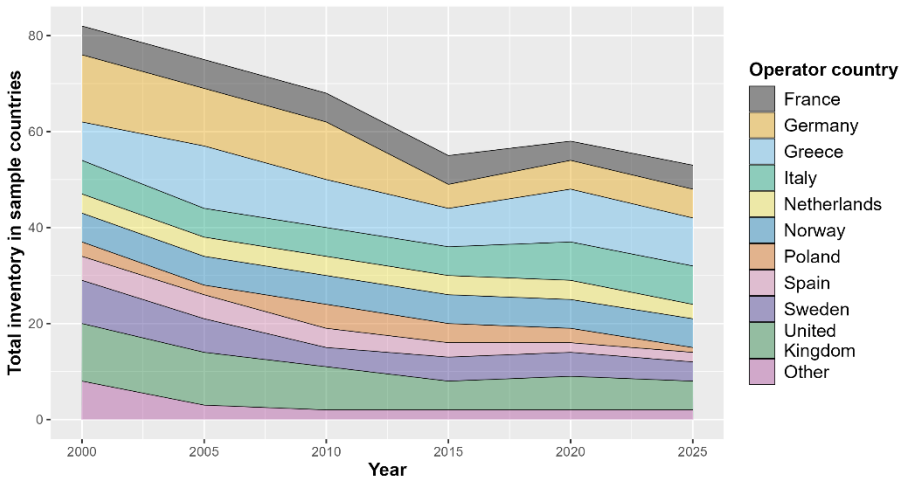

Figure 37: Attack submarines, total European (EU+UK+NOR) stocks by operator country (2000–2025). Shown are those countries that hold the 8 largest total stocks of attack submarines in any of the sample periods; all other countries are collapsed into "Other."

The largest producer of submarines for the European market is Germany, designing and manufacturing submarines that are in service in the navies of Italy, Greece, Poland, Portugal, and Norway. French submarine production primarily satisfies domestic demand, but both Spain and Portugal field submarines of French origin. The sole export-only submarine in the sample,[74] the German Type 209, is in service with Greece and has been exported to many countries outside Europe.

The UK, Sweden, and the Netherlands manufacture domestically designed submarines, but have found no export customers within the European market. Spain's production consists of Spanish-manufactured licensed copies of the French-designed Agosta class; Spain has also been manufacturing the Spanish-designed S-80 class since the last measurement period.

As opposed to many other equipment categories discussed previously, there are very few joint ventures in the submarine space. The joint ventures that do exist are generally in line with the Agosta class, one country building a submarine designed elsewhere. An additional example is Greece, whose submarine manufacturing consists of the German-designed Type 214, built by Greece's Hellenic Shipyards.

[74] France's Scorpène class is also an export-only model, but is not in service with any of the sampled countries.

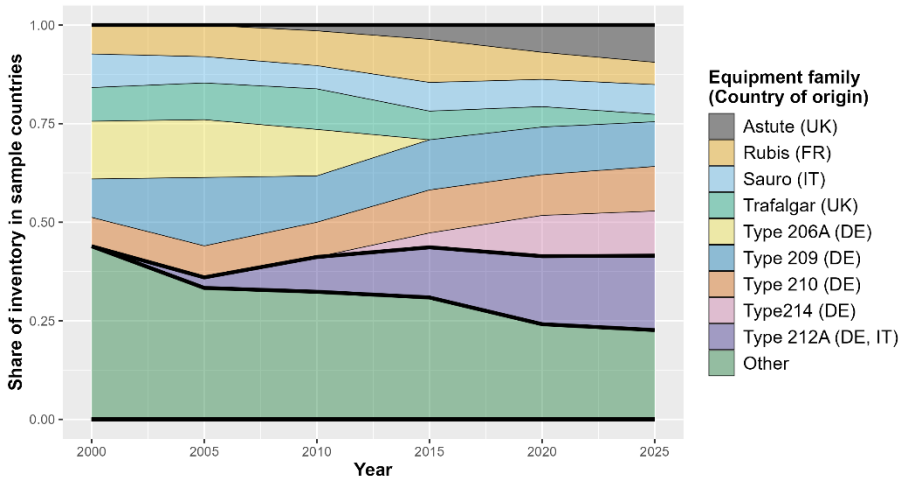

Figure 38: Attack submarines, design families as a share of total European (EU+UK+NOR) inventory, 2000–2025. Shown are those design families which are one of the 6 most prolific design families in any of the measurement periods; all other design families are collapsed into "Other." The thick lines divide nation-of-origin categories (single-country European, multinational European). Nation-of-origin category for design families in "Other" not shown.

4.5.1.4 Integration of maritime systems

The number of systems per operator country has fallen for both classes of surface combatants, owing to a decrease in the number of distinct systems fielded, while the number of operator countries remains the same. For submarines, the number of systems per operator country has increased slightly because the number of operator countries has decreased more than the number of distinct systems has decreased.

Table 7. Summary statistics for maritime systems

Equipment class	**Year**	**Total stocks**	**Operator countries**	**Systems**	**Systems per country**
Small surface combatants	2000	152	15	28	1.87
	2025	109	15	25	1.67
Large surface combatants	2000	24	7	9	1.29
	2025	28	7	8	1.14
Attack submarines	2000	82	14	18	1.29
	2025	53	11	15	1.36

On the surface combatant side, the general trend is one of countries satisfying their own demand with domestic production, both for small and large surface combatants. This leads to a diversified (and hence not very integrated) market for small surface combatants. The market for large surface combatants has a higher HHI

across all time periods, but this is less about integration and more about there simply being fewer countries that field these types of ships.

The large jump in HHI for large surface combatants between 2000 and 2005 is due to many ship classes, comprising one or two units each, being removed from service in that period, while some new ship classes were introduced between 2005 and 2010 at the same time that the UK reduced its large surface combatant inventory by almost half, dramatically lowering the HHI measurement between 2005 and 2010.

Both surface combatant market segments are characterised by a large number of countries producing to satisfy their own demand. The fact that there are more producers of small surface combatants is simply a consequence of the fact that more countries deploy such ships. Why, then, are even small countries represented in producing warships, even when they are not producing their own pieces of equipment in the other domains?

One explanation could be that the countries that manufacture warships already have a civilian shipbuilding industry, and that these serve as suitable integrators for imported specialised naval warfare equipment, the market for which may be more integrated than the market for the ships themselves. The jump from integrating components into a warship may be less difficult for a civilian shipyard compared to the jump from integrating components into an IFV or a tank for a civilian machinery manufacturer.

Another explanation may be that ships are generally built in small numbers. If the production runs are small enough, there are no economies of scale to incentivise specialisation, which could lead to a world with more smaller producers.

Fewer countries produce submarines than small surface combatants, but the segment remains diversified owing to the wide variety of boat classes available. While Germany is the dominant producer of the submarine market segment, there is a transition from the older Type 206 and 209 to the newer Type 212 in roughly the middle of the studied period, which drives the HHI downwards.

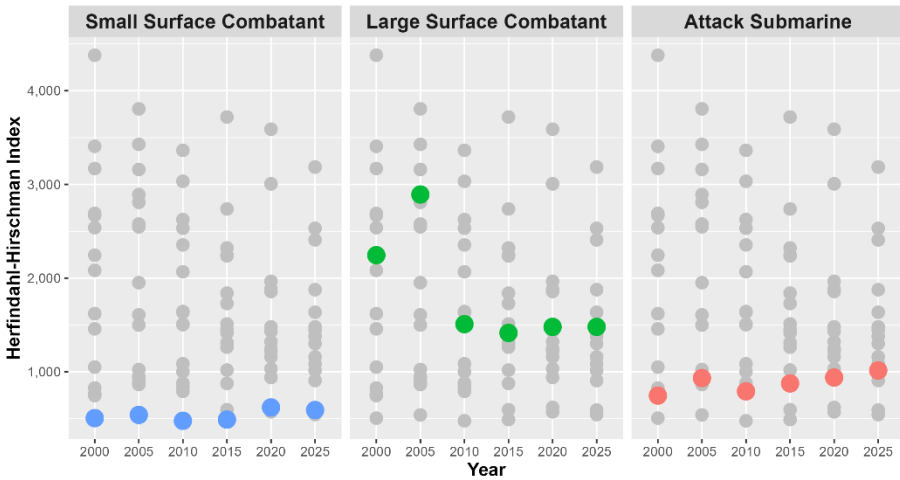

Figure 39: Herfindahl-Hirschman indices for maritime systems (small and large surface combatants, and attack submarines), 2000–2025. The colour-coded dots represent the equipment class in question, while the greyed-out dots represent all equipment classes in the study.

As can be seen in Figure 40 below, for all measured maritime systems, by far the largest country-of-origin category is single-country European. The European cooperative projects in each market segment have been steadily gaining inventory share across the measurement period, with the German-Italian Type 212 being the most common submarine, the Franco-Italian FREMM the most common small surface combatant, and the Franco-Italian Horizon the second most common large surface combatant. As with the cooperative projects in other market segments, these systems are prolific because they were developed by large countries to fulfil the needs of large navies; only France and Italy use the FREMM and Horizon classes, and only Germany and Italy use the Type 212.

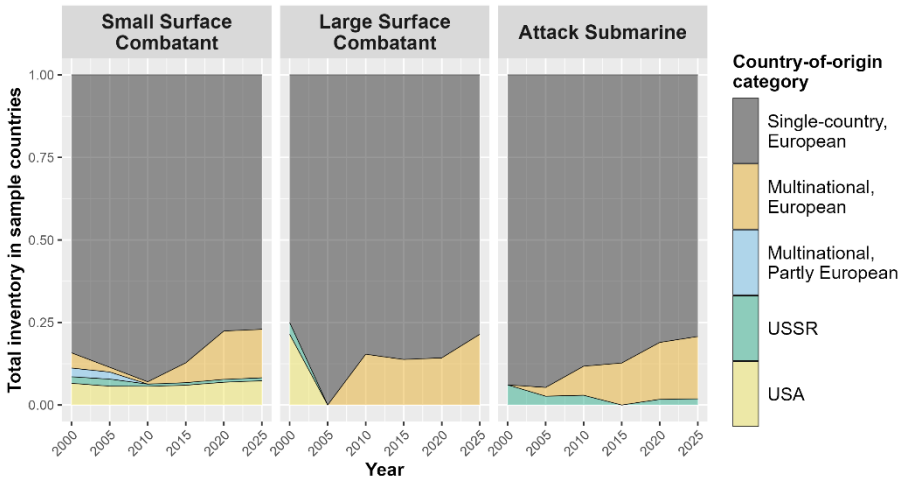

Figure 40: Maritime systems (small and large surface combatants and attack submarines) as share of total European (EU+UK+NOR) inventory, 2000–2025. Systems are divided into categories based on national origin, with “European” denoting countries that are part of the sample (EU+UK+NOR).

One point of integration not reflected in the dataset is that while countries may have several different models of small surface combatants, they tend to use similar weapon systems: many countries have standardised on a few naval weapon systems, using the same weapon system across many launch platforms. For example, France operates one model of torpedo and one model of anti-ship missile (if one counts the submarine-, land- and surface-launched Exocet variants as the same missile) and Sweden operates one model of anti-ship missile and two models of torpedoes. In 2024, nine countries in the sample operated either the RBS15 or Exocet, despite a low overlap in launch platforms.[75]

4.6 Conclusion

4.6.1 Trends

Across all domains, countries in Eastern Europe have moved away from legacy Soviet equipment to a significant degree. They have either begun changing over to primarily European and American equipment (or, as in the case of Poland, to a mix of both, as well as Korean equipment), or, as with attack helicopters, simply reduced the extent to which that capability is maintained.

The MiG-21 went from being the most numerous combat aircraft model in 2000 to being completely divested in 2025. The BMP-1 went from representing 44% of

[75] Calculated from data from IISS (2024).

IFV stocks in 2000 to 22% in 2025. Soviet tanks comprised just below 40% of tank stocks in 2000, decreasing to 18% in 2025. The classes where Soviet systems have not decreased are those where the initial numbers were low, such as transport aircraft and naval systems.

While Soviet-origin systems are losing prominence, large stocks of defence equipment in the European inventory are of American origin. The US supplies some of the most widespread models in classes such as APCs (M113), fixed-wing combat aircraft (F-16), attack helicopters (AH-64), self-propelled howitzers (M109), and rocket artillery (M270). On the ground, Europe is well positioned to supply tanks and IFVs, with very little American equipment among the sample countries. Similarly, American ships are largely absent from the entire European naval inventory.

Another domain-spanning trend is that larger countries such as France, the UK, Germany, and Italy, tend to produce equipment to supply their own needs to a larger extent than small countries. The most successful joint European development projects in terms of share of stocks have generally involved these four countries, and the projects have mainly served to supply the needs of these countries' armed forces.

Smaller countries, meanwhile, tend to import equipment to a larger degree. Some smaller countries have found niches wherein they can produce equipment that achieves widespread adoption, but often such export successes are sold mostly to other small countries, although there are some exceptions.

The most striking development throughout the sample period, however, is the decrease in size of almost all stocks of materiel. The only equipment classes that have seen their stocks increase are attack helicopters and large surface combatants. All other classes have decreased, and in many cases by a third or by half. The stocks of tanks and towed howitzers have both decreased by more than two thirds since 2000. Both classes of transport aircraft have decreased relatively little, around 15%, which may imply that transport capability allows a scaled-down force to do more with less. Two comparisons are especially noteworthy: APCs versus IFVs, and towed artillery versus self-propelled artillery. For the purposes of being able to field a unit of a certain size, APCs and IFVs are more or less interchangeable, as are towed howitzers with self-propelled ones[76]. However, APC stocks have decreased significantly more than IFVs (55% versus 31%) and towed artillery has decreased significantly more than self-propelled artillery (66% versus 29%). This implies that, at least for these equipment classes, the trend has been towards fewer, more advanced pieces. This trend may be broken or lessen in intensity in the near future as the countries of Europe seek to rearm.

[76] The equipment classes are not interchangeable in terms of *capability*, but they are interchangeable in the sense that a mechanized rifle platoon will require 3-4 IFVs, or 3-4 APCs. Similarly, an artillery battery will consist of the same number of pieces whether they are tracked, wheeled or towed.

4.6.2 Integration

Has integration increased or decreased across the measured time period? The main conclusion from the analysis of European stocks of materiel in this chapter is: It varies.

Out of the 13 classes of equipment examined in this study, 7 have seen the distinct number of equipment design families decrease, 5 have seen it increase, and one is unchanged. 6 equipment classes have seen the number of equipment design families per operator country increase, while 7 have seen it decrease. By both of these measures, there is a slight shift towards integration in terms of equipment design families, with a gradual reduction in the number of systems overall and per country actually operating each equipment class.

The Herfindahl-Hirschman indices computed for each equipment class are higher when the market segment (equipment class) is characterised by fewer systems with a larger market share, and lower when it is characterised by more systems with smaller market shares. By this measure, only 5 equipment classes have become more integrated over time, while 8 have become less integrated.

The final axis of analysis in this section is the share of stocks that are of European origin, and especially the share of stocks that are of joint European origin.

On the maritime side, the share of European production is large: over 75% across all periods for all three equipment classes. The share of jointly European origin is also significant, and rising. For large surface combatants as well as for submarines, it is at or slightly below 25% at the last measurement period, while it stands at around 15% in 2025 for small surface combatants.

In the air domain, the share of joint European development is again high and rising, ranging from roughly 20% for transport helicopters and fixed-wing combat aircraft to almost 50% for transport airplanes and attack helicopters. In three out of four air-domain equipment classes, the US is the plurality single-nation supplier, whereas European single-nation developed systems are more numerous among transport helicopters.

The ground domain has precious few jointly developed European systems, and is dominated by single-country equipment systems, both those supplied by the US and by European nations, as well as large stocks of legacy Soviet equipment.

Thus, while there are several differences between sectors, there is no certain direction for European defence-industrial integration. Only time will tell if more recent policy initiatives and the current rearmament of Europe will change this trend in a given direction.

The current geopolitical climate may drive integration in either direction. A sense of urgency may cause countries to prioritise speed of delivery, plausibly decreasing integration. On the other hand, integration would increase if the current major

producers are better able to scale up production of their popular models compared to smaller producers.

Out of scope for this study is an analysis of the extent to which integration happens at a scale below the equipment model: a convergence on a few models of, e.g., anti-ship missiles throughout Europe's navies would be a movement towards integration even if the missiles are fired from different ship classes. Analysis at an even finer resolution would also be instructive: integration in terms of equipment systems may matter less if the parts that most often need replacing (ammunition, tracks, engines, howitzer barrels, etc.) are compatible or identical, if sensor and communications equipment are compatible and if the most complex subcomponents of the various systems are integrated.

5 Concluding Remarks

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Within the global defence industry, the US continues to hold a unique position in both size and sophistication. While China has steadily narrowed this capability gap over the last few decades, it is still playing catch-up. Russia has ramped up production following its invasion of Ukraine, but lacks the resources to compete with the overall scale and sophistication of the US and China in the long term.

Meanwhile, the European defence industry consists of several medium- to small-sized arms-producing countries. The EU has undertaken several policy initiatives to reduce fragmentation and increase integration. Over the past decade, the state of the European Defence Technological and Industrial Base (EDTIB) and efforts to reduce fragmentation have been at the forefront of policy discussions across Europe. Historically, this fragmentation has stemmed from a strong preference for national procurement and industrial sovereignty, with European countries traditionally investing heavily in their domestic defence industries. However, the picture of fragmentation is more nuanced than often assumed in previous studies.

This study shows that the development of defence equipment stocks in Europe over time generally presents a mixed picture. Some equipment categories are highly integrated, with multinational European systems being widespread in all air categories, for example. In other categories, such as main battle tanks, the trend is one of convergence towards single-nation European systems. Across all categories, there is a trend of Eastern European nations reducing their stocks of legacy Soviet equipment, which in some market segments decreases integration as measured by the Herfindahl-Hirschman Index, albeit to the benefit of the European defence industry (as these divested systems are often replaced by European alternatives). There is the expected split between small and large European countries, with the larger countries more often developing their own equipment, and with the stocks of large countries often driving integration at the macro scale.

In that regard, fragmentation today is often attributed to legacy systems and varying national requirements, rather than purely current industrial conditions, including present production capacity. Moreover, excessive consolidation—as seen in the United States—can also bring drawbacks, such as reduced competition and heightened vulnerability due to supplier concentration. This study also shows that material stocks have decreased in most segments during the measurement period. This reflects the fact that Europe, for a long period, had declining defence budgets and procured more advanced systems, but in smaller volumes.

In all, it may in the future be more appropriate to focus on production capacity and the number of current and planned production lines and capacities in the various segments (land, maritime, and air) explored in this report, rather than solely on

existing material stocks, in order to better assess the degree of fragmentation and integration within Europe.

Since Russia's full-scale invasion of Ukraine, European defence budgets have also increased significantly. However, much of this military spending has been directed towards addressing existing capability gaps and replenishing stocks following substantial equipment transfers to Ukraine. The war has exposed deep-rooted structural weaknesses in the EDTIB, including limited production capacity, supply chain disruptions, and a shortage of skilled labour. These issues are further compounded by decades of underinvestment and a longstanding focus on the development of advanced but low-volume platforms.

Since 2022, there has moreover been a notable uptick in procurement from non-EU suppliers, prompting concerns about the long-term state of the EDTIB and the possible increase of fragmentation of the material stocks in Europe. Nonetheless, European industrial capacity is gradually recovering in areas such as main battle tanks and infantry fighting vehicles. The war in Ukraine has also spurred renewed investment in munitions, drones, land systems, and air defence, though sectors such as naval and aerospace have so far been less affected.

Overall, the EDTIB remains in a complex and evolving landscape. A certain degree of fragmentation is likely to persist, driven by national interests, sovereignty concerns, and industrial competition. However, rising demand, strategic pressures, and capability shortfalls may yet catalyse a new phase of European consolidation—one that must strike a careful balance between efficiency, diversity, competition, and equitable participation among member states.

5.1 Further studies

The constant evolution of the global defence industry will require future updates of this study, or studies with similar research objectives, to describe and assess international defence-industrial capabilities.

An important question, somewhat outside the scope of this study, is the extent to which integration in terms of equipment models matters compared to *standardisation*. Across all domains, there are gains to be made from straightforward interoperability even if different countries procure different equipment. The gains from standardisation vary across domains and market segments, as may the associated difficulties.

The data available for this study permits measuring integration along only a few dimensions, and expanding the range of measures is critical to developing a nuanced understanding of whether the European defence sector is truly integrated.

A similar study to the present one could also be performed along the designer and manufacturer *company* dimension. This would require gathering data on, or per-

forming some assumptions about, which specific pieces of equipment were manufactured by which company, since many materiel systems examined in this study have been manufactured by different companies at different times, and companies have merged or split over time.

The present study has only briefly mentioned integration along the sub-component or interoperability axes: We have mainly considered integration in terms of equipment models: A market segment is more integrated if more countries use the same model. The variety of models in use will plausibly have an effect on acquisition and maintenance costs, and two countries using the same system are very likely to have both parts commonality and interoperability.

However, parts commonality and interoperability can be achieved by other means besides purchasing the same equipment model. In the case of e.g. howitzers, large strides towards integration may be achieved as long as the systems in use can benefit from the same replacement barrels and fire the same ammunition; if these goals can be achieved it may matter less if every country designs its own bespoke howitzer model. The same holds for many other equipment classes; if countries use a common munition, whether they use a common launch platform may matter less.

Finally, the ongoing discussion regarding production capacity may plausibly have large effects on – and may be affected by – integration, in both directions. Countries that find themselves in urgent need of equipment may fill that need by buying what is available for delivery *right now*, instead of prioritizing integration with their present stock of materiel. Conversely, a market segment characterised by a large degree of integration may find that only a few producers can supply the equipment that actually works with the present stock of materiel, increasing integration. Whichever way the wind blows (and for which market segment), must be left to a future study, as the full effects will not materialise for a number of years.

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Appendix A: Arms Industrial Countries

Table A. Size of Defence Industrial Countries by Top 100 Arms Companies, USD million, current prices, 2023.[77]

Rank	Country	Arms Sales (USD Billion)	No. Entities among Top 100	Share of Top 100 (%), 2023
1	US	316.8	41	49.6
2	China	102.9	9	16.1
3	UK	47.7	7	7.5
4	France	25.5	5	4.0
5	Russia	25.5	2	4.0
6	Trans-European	21.0	3	3.3
7	Italy	15.2	2	2.4
8	Israel	13.6	3	2.1
9	South Korea	11.0	4	1.7
10	Germany	10.7	4	1.7
10	Japan	10.0	5	1.6
11	India	6.7	3	1.1
12	Türkiye	6.0	3	0.9
14	Sweden	4.4	1	0.7
15	Taiwan	3.3	1	0.5
16	Singapore	2.2	1	0.3
17	Ukraine	2.2	1	0.3
18	Poland	2.1	1	0.3
19	Norway	1.5	1	0.2
20	Canada	1.4	1	0.2
21	Spain	1.2	1	0.2
22	Czech. Rep.	1.2	1	0.2

[77] SIPRI (2024) *Arms Industrial Database*.

Appendix B: Equipment categories

Table B1: Categories in Military Balance Plus versus the categories used in this study.

Category (IISS)	Category (FOI)
Amphibious Assault Vehicle	Armoured Personnel Carrier
Armoured Personnel Carrier (APC)	Armoured Personnel Carrier
Armoured Personnel Carrier (Tracked)	Armoured Personnel Carrier
Armoured Personnel Carrier (Wheeled)	Armoured Personnel Carrier
Infantry Fighting Vehicle	Infantry Fighting Vehicle
Main Battle Tank	Main Battle Tank
Artillery (ARTY)>Towed>All subtypes	Towed Artillery
Artillery (ARTY)>Self-Propelled>All subtypes	Self-propelled Artillery
Artillery (ARTY)>Multiple Rocket Launcher (MRL)>All subtypes	Multiple Rocket Launcher
Fixed-Wing>Fighter Aircraft	Fixed-wing Combat Aircraft
Fixed-Wing>Fighter Ground-Attack Aircraft	Fixed-wing Combat Aircraft
Fixed-Wing>Ground Attack Aircraft	Fixed-wing Combat Aircraft
Fixed-Wing>Tanker Aircraft>Tanker Aircraft	Fixed-wing Transport/Tanker Aircraft
Fixed-Wing>Tanker Aircraft>Tanker/Transport Aircraft	Fixed-wing Transport/Tanker Aircraft
Fixed-Wing>Transport (TPT)>Heavy Transport Aircraft	Fixed-wing Transport/Tanker Aircraft
Air>Fixed-Wing>Transport (TPT)>Medium Transport Aircraft	Fixed-wing Transport/Tanker Aircraft
Fixed-Wing>Transport (TPT)>Passenger Transport Aircraft	Fixed-wing Transport/Tanker Aircraft
Rotary-Wing>Attack Helicopter	Attack Helicopter
Rotary-Wing>Multi-Role Helicopter	Transport/Multirole Helicopter
Rotary-Wing>Search and Rescue Helicopter	Transport/Multirole Helicopter
Rotary-Wing>Search and Rescue Helicopter>Combat Search and Rescue Helicopter	Transport/Multirole Helicopter
Rotary-Wing>Transport (TPT)>Heavy Transport Helicopter	Transport/Multirole Helicopter
Rotary-Wing>Transport (TPT)>Light Transport Helicopter	Transport/Multirole Helicopter
Rotary-Wing>Transport (TPT)>Medium Transport Helicopter	Transport/Multirole Helicopter
Patrol and Coastal Combatants>Corvettes>All subtypes	Small Surface Combatant
Principal Surface Combatants>Frigates>All subtypes	Small Surface Combatant
Principal Surface Combatants>Destroyers>All subtypes	Large Surface Combatant
Submarines>Tactical>Attack Submarine	Attack Submarine
Submarines>Tactical>Nuclear Powered Attack Submarine	Attack Submarine

Table B2: Adjustment to the IISS categorisation of specific equipment design families.

Equipment design family (model)	Category (IISS)	Category (FOI)
Bv-206 (All models)	Armoured Personnel Carrier (Tracked)	(Excluded)
Aerospatiale Gazelle (SA341F Gazelle, SA342AATCP Gazelle, SA342M Gazelle)	Attack Helicopter	ATGM Helicopter (only partly included, see section 4.3.1.2)
Airbus Helicopter BK105 (Bo-105 M PAH-1, BO-105 HOT, Hkp-9A)	Attack Helicopter	ATGM Helicopter (only partly included, see section 4.3.1.2)
Dassault Falcon Family (All models)	Passenger Transport Aircraft	(Excluded)
Gulfstream Family (All models)	Passenger Transport Aircraft	(Excluded)

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