The future of cooperative programs in Europe, paradox of a hybrid market

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Abstract

For European arms-producing countries, launching a cooperative program represents a compromise between preserving their domestic industrial base and achieving an affordable acquisition. Nevertheless, scientific literature is marred with criticisms regarding the effectiveness of such an approach. Paradoxically, this does not prevent European states from committing to new cooperative programs—the European Commission has set up mechanisms for improving the effectiveness of European defense industry based, de facto, on incentives to launch cooperative programs. This article looks at the place of cooperative programs in Europe to understand whether the new initiatives of the European Union can succeed in improving the effectiveness of military spending as well as enhancing European strategic autonomy. It analyzes the organization of the European armament market to explain why cooperative programs appear unavoidable. It explores how the European Commission could overcome current limitations through community-funded programs, given that such funding would foster the emergence of a European defense technological and industrial base.

Cooperative programs are a common feature among arms-producing countries, notably the most ambitious ones. This is particularly the case in Europe, where cooperation has represented a means to overcome the fragmentation of demand and supply into several national markets—with purely domestic complex defense capability programs becoming unsustainably costly in the 1980s. Cooperative programs represent a compromise between preserving a domestic industrial base and achieving affordable acquisition. Nevertheless, the literature in defense economics and political science is critical regarding the effectiveness of such an approach.[1]

Paradoxically, these critics do not prevent states from committing to new cooperative programs, e.g., future combat air systems (FCAS) and main ground combat systems (MGCS) today. In addition, the European Commission has set up mechanisms for improving the competitiveness[2] of the European defense industry that are based, de facto, on incentives to launch cooperative programs—notably, this is how the European Defence Fund (EDF) is functioning.[3] It is therefore necessary to understand how such programs can deliver the expected secure access to advanced capabilities at an affordable cost with a certain degree of strategic autonomy, despite the limits of past cooperative programs.

This article looks at the place of cooperative programs in Europe in order to understand whether the new initiatives of the European Union, like the EDF and the European Defence Investment Programme (EDIP), can succeed in improving the effectiveness of military spending as well as enhancing European strategic autonomy. The first part explores the limits of past cooperative programs, in the light of the organization of the European armament market,

1 Hartley (2008); Schumacher (2014)
2 Even though the European Commission uses the concept of competitiveness, it would be more relevant to speak of effectiveness since this dimension looks primarily at costs than at the ability to export. Therefore, this article will use effectiveness instead of competitiveness with regard to the mechanisms set up by the European Commission.
3 De La Brosse (2017)

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in order to explain why such programs appear to be unavoidable. The reasons why it is unlikely that intergovernmental cooperation leads to an integrated European market are then examined. This is followed by an exploration of how the European Commission could overcome related limits through community-funded cooperative programs—fostering the emergence of a European DTIB (defense technological and industrial base).

Cooperative programs have been a critical feature of the European armament market for decades.
At the same time, European countries try to preserve their local capabilities by guaranteeing domestic security of supply while also minimizing costs by gathering resources on both demand and supply sides. The European Commission aims to induce countries to go further in terms of European supply and demand integration. It must however, clarify how cooperative programs are expected to promote the emergence of a genuinely European defense technological and industrial base.

Cooperative programs: a European way for accessing advanced capabilities

There is an apparent paradox regarding the European armament market. Despite many critics being against cooperative programs, they still represent a preferred approach for arms-producing countries, especially in order to access advanced defense capabilities. Nevertheless, the unique not-purely-domestic and not-yet-truly-integrated structure of the market can explain both these limits and the reason why states continue to launch such cooperative programs. Given this, cooperative programs are likely to remain a key feature of armament programs in the future, even for projects supported by community funding.

Intergovernmental cooperative programs and their limits

Cooperative programs are a feature of the European armament market since the second half of the 20th century. As Western European countries expected to restore or expand their DTIB during the cold war, working together was the preferred approach to improve strategic autonomy. Even though this approach was primarily a political choice[4], budgetary and industrial constraints have become predominant in favoring cooperation from the 1980s. Due to the cost escalation of major capabilities, even large European arms-producing countries have become less and less capable of sustaining purely domestic programmes [5]

Indeed, in theory cooperative programs can provide substantial benefits compared to domestic ones. Research and development costs represent a large share of advanced capability programs—for instance, even for a program as large as the F-35 combat aircraft, R&D represents 22.6 percent of total costs.[6] The lower the production volumes are, the higher the share of budget allocated to R&D is—although, R&D costs are independent from expected production volume but depend on expected performances of a given capability. The fragmentation of European market results in multiplying redundant R&D spending, making purely domestic programs unaffordable; cooperative programs offer the possibility of substantial savings.

Combining national orders is also likely to reduce unit costs—deliveries can come closer to the optimal level of production, minimizing unit cost, and a large volume of orders smooths production ups and downs thereby maximizing productivity. In a cooperative program, participating countries can also share non-recurring costs (e.g., final assembly lines), which are generally sunk costs being specific for particularly advanced defense capabilities.

In the last quarter of the 20th century, economic imperative has favored a Europeanisation of defense investment,[7] a trend reinforced by enthusiastic states with regard to the deepening of European defense.[8] However, when political

4 Faure (2020)
5 Bellais (2017b)
6 GAO (2022)
7 Bellais (2017b)
8 For an overview of such trend, see From St-Malo to Nice, European defense: core documents, compiled by Maartje Rutten. Chaillot Paper 47, Paris: Institute for Security Studies, 2001.

division prevents market integration achieving the market size required for a sustainable DTIB, cooperation can be adopted as the second-best solution. European cooperation has taken multiple forms, from bilateralism to multilateralism (including minilateralism); i.e., flexilateralism, defined by Samuel Faure as "the policy through which a state simultaneously implements varieties of international cooperation to address a public problem."[9]

However, cooperative programs have not delivered their theoretical benefits. Some consider that arms cooperation simply fails in Europe—"not as successful as expected" would perhaps be more appropriate, with some European cooperative programs underperforming or encountering stalemates.

Most initial assessments regarding defense programs suffer from "the conspiracy of optimism", being a (sometimes consciously deliberate) underestimation of risks, costs, and timescales in order to ease the launching of a new program.[10] This is especially true with regard to cooperative programs, because of higher information asymmetry and frequent lack of past experiences between participating states and industrial stakeholders. Such a conspiracy represents a means to launch a cooperative project, then later insulating the corresponding program from possible budget cuts.

Nevertheless, the limits of cooperative programs result mainly from specific issues that are markedly evident in Europe (though can appear in non-European projects). In particular:

- Such programs do not have optimized specifications, because participating states are not keen to compromise on domestic military specifications. Rather than leading to a unique design, cooperative programs result in several variants of systems (e.g., 23 versions for the NH90 mission helicopter) that have sometimes a markedly loose connection between each other (e.g., French and Italian FREMM frigates). Limited convergence on specifications significantly reduce potential economies of scale.
- The workshare between industrial partners is not based on industrial grounds but on political ones. Each participating country expects to get back at least its share of funding and, to secure such juste retour, it designates which domestic companies must be included in the project. Due to such political interferences, the choice of contributors does not rely on industrial logic in terms of work-sharing or responsibilities. It can also introduce unnecessary risks when industrial partners have to develop new competencies and systems which already exist elsewhere (e.g., the TP 400 engine for the A400 mission aircraft).
- European intergovernmental cooperation is problematic since there is no *primus inter pares* between countries (contrary to transatlantic ones for which the predominance of the United States gives it such a role[11]). This results in a lack of demand-side leadership: no delegation of authority, limited competences, conflicts of agendas, heterogeneity of domestic procurement agencies, etc. that impedes both the implementation of the project on the demand side and the supervision of the supply side.
- Because of the political selection of participating companies, it is difficult to designate a single industrial architect as decision make regarding the design, workshare, and management of the supply chain (e.g., the stalemate between Germany and France about the leadership of FCAS project being Airbus or Dassault Aviation). The lack of supply-side leadership is likely to result in dysfunctionalities, such as weak mechanisms of arbitration and cooperation/competition dilemmas for industrial partners.

9 Faure (2019, p. 1)
10 Witney (2012)
11 Some biases of cooperative programs can be reduced when the United States is involved thanks to a huge asymmetry of power that gives the American side the ability to impose decisions (cf. F-35). There is a de facto alignment of other countries, which accept both military specifications and industrial workshare defined by the United States.

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The NH90 helicopter perfectly illustrates the combination of such biases, but it is possible to find counter-examples of successful European cooperative programs like the Scalp/Storm Shadow missile or the Boxer armored vehicle. There are no exceptional issues linked to military capabilities with problems in cooperation and/or obstacles in developing complex systems being similar in both civilian and defense programs. For instance, developing civilian aircrafts can be challenging with multiple industrial partners, large international value chains, and ambitious technological roadmaps. Programs like the A380, C919 or B787 have experienced several difficulties and crises that are very similar to ones observable in the defense industry (or other civilian domains like nuclear energy, high-speed trains, or satellites).[12] Many civilian cooperative programs have experienced disappointments too, especially concerning complex systems. Defense cooperation is not doomed to failure *per se,* but, particularly in Europe, factors exist that favor issues and stalemates which particularly apply in Europe.

A unique hybrid armament market in Europe

The limits and stalemates of cooperative programs are not specific to projects between Europeans. Non-European cooperative programs and even purely domestic ones have experienced additional delays, excessive costs or lower than expected technical performance[13].

Nevertheless, it is certain that many European cooperative programs have delivered lower than expected outcomes, repeatedly and without evidence of learning. An explanation can be found in the organization of the European armament market, characterized by the major role played by cooperative programs for advanced military capability (out of necessity). The European configuration is globally atypical in that cooperative programs have not logically led to cross-border integration (as would be expected in civilian markets). In reality there is no "European armament market" because of constraints imposed by states to preserve their domestic DTIB. Europe is in fact composed of a set of national armament markets with limited porosity between them—creating a need for repeated new cooperative programs in order to maintain industrial cross-border partnerships.

Given the above, this article labels the European armament market as a "hybrid market" reflecting its arrested development between a purely domestic organization and a full Europeanisation. This concept can be compared to the different kind of industrial globalization in civilian sectors.[14] Despite some cross-border links, companies have to find a compromise between a true industrially-sound integration at the European level and a national footprint that is still required by the demand side as a condition for the security of supply.[15] This in-between situation creates a hybrid market, combining national and European dynamics, where companies must rely on cooperative programs in order to manage both levels of this peculiar market. This feature explains why most of European groups can be defined as multidomestic companies.

With limited success, the European Commission has pushed for a more open internal market at the European Union level, in fact since the years that followed the end of the cold war.[16] Contrary to the civilian market, armament regulation remains a national competency and states rely on Article 346 TFUE (Treaty on the Functioning of the European Union) to prevent the European Commission from harmonizing rules and creating a unique market at

12 Cohen (1992); Lawrence and Thornton (2005)

13 Reports from American GAO, British NAO, French Cour des Compte, etc. provide numerous examples of programs that have poorly performed.

14 Berger (2005); Hagedoorn and Schakenraad (1994)

15 We do not consider, here, other grounds that push states from rejecting the creation of an integrated armament market in Europe similarly what was achieved for many civilian markets. However, several reasons exist beyond national security favoring a kind of protectionism: local industry interests, employment, dual activities and technologies, exports, etc. These dimensions can be considered as factors amplifying the dynamics linking to the security of supply rather than modifying them. For the sack of demonstration, this article does not deal with these dimensions.

16 Underlined by the Bangemann communication. See *The Challenges facing the European defense-related industry, A contribution for action at European level*, COM(96) final, Brussels: Commission of the European Communities, 24 January 1996.

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European Union level. Despite this, the European Commission succeeded in promoting two directives on intracommunity transfers (2009/43) and public markets on defense and security (2009/81); paving the way for the creation of a unique European market by facilitating better fluidity on both demand and supply sides.

Despite the defense package of 2009, states still resist the integration process that these directives should favor. The implementation of these directives relies on the goodwill of states and the limited implementation of this defense package clearly demonstrates that states are not keen to accept such rules of the game, especially regarding the opening of their defense procurement; and so the situation remains fragmented. Maulny *et al.* (2020) illustrate the situation:

> "*During the 2016-2019 period, the study suggests that the implementation of Directive 2009/81/EC has improved compared to 2011-2015 but remains at a significantly lower level than for non-defense procurements. In particular, the publication rate (i.e. the proportion of procurements that have been tendered competitively through TED) for defense procurements has reached 11.71 % in average over the 2016-2018 period which is higher than on the 2011-2015 period (8.5% in average). However, it remains significantly lower than for non-defense procurements (around 24% for procurements covered by the 'general directive'). Despite a certain improvement, TED data suggests that most contracts remain awarded on a purely national basis (82% in average).*"[17]

Even with this favourable environment, states have not fundamentally changed the way they regulate armament markets. They continue to focus on a domestic perspective that maintains the fragmentation of markets over Europe. This fragmentation on both the demand and supply sides results in poorly effective domestic markets, which are quite often below the threshold of sustainability due to the size of domestic orders and the cost of required technology and investment. The only solution is to integrate national DTIBs to create a larger and more competitive European market—an economic evolution made difficult by political requirements linked to sovereignty and security of supply.[18] This is why cooperative programs play such a critical role as a second-best solution in Europe and why most of these programs appear inadequate.

Arms procurement is ultimately a demand-led market that is defined at the national level. Indeed, the defense industry can influence the choices of investment (technical specifications, types of equipment, quantity, intra-budgetary competition, etc.). However, nothing is possible without demand-side impulse and decisions. In addition, European industrial cooperation implies that many decisions that companies usually take in civilian sectors are also taken by states in the field of armament: which company is involved, how workshare is allocated, in which country activities are located, how IPRs are managed, etc.

Companies are not able to push for a deeper integration of national markets, since any cross-border activity relies on the authorization from involved countries—in particular with regard to export regulation or the security of supply. The defense industry exists primarily in order to fulfil the needs of domestic armed forces. Contrary to civilian activities, defense companies do not have many levers to reshuffle their assets across borders (even though they are multi-domestic groups) and to implement strategic decisions at the group level.

This explains that while European mergers and acquisitions have created some European groups (e.g., Airbus, Thales, and BAE Systems), it has not resulted in the creation of specialized centers in different European countries. Trans-European companies have an industrial footprints quite similar to the one before consolidation.[19] Thus the only

17 TED is the Tenders Electronic Daily published online by the EU. Quotation from Maulny, Simon and Marrone (2020, p. 63)
18 Briani (2013)
19 Bellais and Jackson (2014)

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specialization that has emerged has resulted from demand-side requirements.

MBDA, however, may provide a good example of consolidation. Its centers of excellence in France and the United Kingdom were created thanks to the Lancaster House treaty signed in 2010 and the resulting intergovernmental agreement in 2015. Both countries had similar competencies in missiles systems but without a sufficient workload to secure the sustainability and related strategic autonomy. The treaty opened the way to overcome duplications and create specialized centers of excellence located across the countries thanks to a politically-blessed mutual interdependency, giving birth to a shared missile technological and industrial base.[20]

This example is almost unique in Europe regarding its degree of cross-border integration, but it proves that this process can be achieved given the political will and trust between involved countries. As such, the European armament market can further be defined as a hybrid market because it combines purely domestic features with some aspects of Europeanisation achieved mainly through cooperative programs (mostly in terms of value-chain organization). However, cross-border features rely on domestic decisions and could be reversed if such a change corresponds to national choices. In this sense, the European armament market's unique configuration that simultaneously combines domestic and European features has come about because a purely domestic DTIB is no longer sustainable industrially while a fully European DTIB is not acceptable politically.

States interfere with industrial dynamics and strategy. For instance, they can induce competition or duplications across Europe despite limited market size or limiting/blocking cross-border consolidation and reshuffling without a true industrial rationale.

Europe's unique configuration in the world renders any progress toward the integration of domestic DTIBs fragile since it depends on the goodwill of national decision-makers without any third party being able to push in favor of an irreversible integration process. We are far from the expected dynamics from a national to a European market that many had envisioned in the late 20th century.

No ratchet effect from intergovernmental cooperation

By the end of the 20th century, many had perceived the blossoming of European cooperative programs as the prelude to the creation of an integrated armaments market inside the European Union—particularly after the European Defence Agency (EDA) was set up in 2004. However, intergovernmental cooperation appears to be a temporary coalition of the willing because it is driven by a series of specific passing shared interests or stakes. If the Europeanisation dynamic stalls or if domestic interests are no longer compatible with a cross-border approach, any progress toward a more integrated European market could be stopped or even reversed.

The weakening of the Europeanisation dynamics

While many European cooperative projects were launched at the turn of century, such dynamics have almost vanished over the past two decades. Ongoing programs have experienced some difficulties which to a degree can explain the lack of appetite for new cooperative projects with European countries continuing to prefer domestic rather than cooperative projects, despite a fall of military spending after the 2007-2009 financial crisis. As EDA statistics underline, European collaborative procurement remains limited to a fifth of total procurement in the long term despite limited budgets and cost escalation of major capabilities.[21]

European collaborative procurement spending was on an upward trend until 2011 as a result of legacy programs, especially those launched in the 1980s and 1990s. Such dynamics seem to have weakened ever since—despite the creation of the EDA in 2004 as an intergovernmental agency aimed to foster cooperation and market integration at the European Union level. As the EDA underlines, member states have not achieved the benchmark they had

20 Bellais (2022)
21 Kirkpatrick (2004, 2008)

collectively approved, namely that of 35 percent of European defense equipment procurement being collaborative. It seems that the creation of EDA did not help to strengthen the incentives to develop and procure capabilities through cooperation.

In Figure 1 this trend is clear in absolute values, with collaborative spending being nearly cut by half. The marked exception to this is 2021, and the below further analysis is based on the period to 2020.[22] Without a concerted effort to pursue the Europeanisation of defense investment, nations will continue favor domestic programs or off-the-shelf procurement to the detriment of new European cooperative projects. It is even worse regarding defense Research and Technology (R&T). European collaborative R&T spending has collapsed in both absolute value and relative share since 2008, revealing the absence of common desire for sharing future capability programs. Such investment is especially required for emerging technologies where huge non-linear investments are necessary in order to have a level playing field with international competitors.[23]

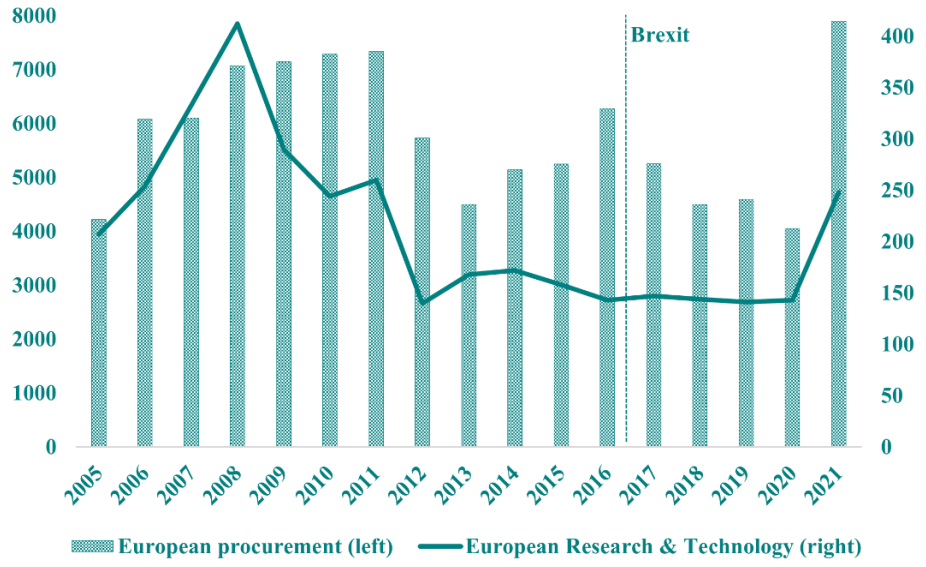

Figure 1: European collaborative military spending in EUR bn
Note: 'EDA 27' until 2016, all EU member states except Denmark; 'EDA 26' from 2017 after the exit of the United Kingdom from the EU.
Source: European Defence Agency.

As described in Figure 2, member states have been far from reaching both EDA collaboration targets of 20 percent of R&T and 35 percent of procurement. Shared R&T as a whole and as a percentage of all R&T spending have drastically fallen since their 2008 peak due to the ending of major cooperative projects launched in the 1990s and the lack of major new projects. Paradoxically, the smaller the budget that states allocated to defense R&T, the more resources they spend in purely domestic projects. It seems that the EDA has not be able to become the expected catalyst for common projects between its member states.

Available EDA statistical series contain a discontinuity, since they include the United Kingdom only until 2016, when it left the European Union. It is not possible to reconstruct global statistics without the United Kingdom—however, given that the United Kingdom was a country with low enthusiasm for European cooperation, its exit from the European Union would have been expected to raise the relative number of cooperative programs as seen in the EDA data. The fact that this is not visible illustrates that the United Kingdom was far from the only country to become reluctant to choose European cooperative programs.

22 2021 is ignored as recent data of this sort is often subject to revision, there may be COVID lockdown effects. Further year data publications will clarify this.
23 Setter and Tishler (2006)

It seems that cooperation between European countries can no longer nurture a cross-border integration of both demand and supply sides at the European level or favor the deepening of existing cross-border links.

Nevertheless, while cooperative programs are seen not to be the preferred option, the apparent disenchantment does not prevent countries from launching new cooperative programs when this is the only option to combine autonomy and sustainability—illustrated by Eurodrone, FCAS (with two competing projects[24]) and MGCS. The European armament market seems to be stuck with its suboptimal hybrid organization with fragile intergovernmental cooperation—it favors neither a convergence of military needs on the demand side, nor an integration of DTIBs at a European level.

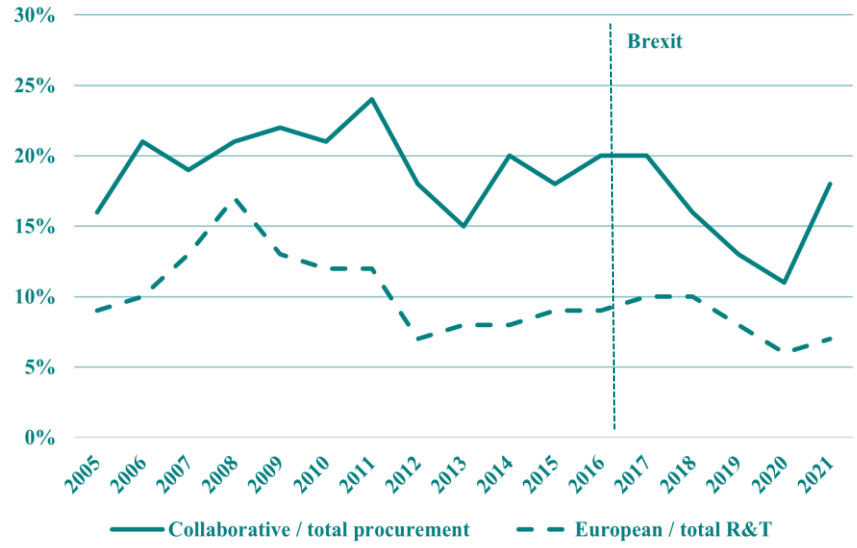

Figure 2: European collaborative military spending as percentage of total military spending
Note: 'EDA 27' until 2016, all EU member states except Denmark; 'EDA 26' from 2017 after the exit of the United Kingdom from the EU.
Source: European Defence Agency.

The temporary nature of intergovernmental cooperation

Contrary to late 20th century expectations, the launching of cooperative programs is not an irreversible process that transforms the European armament market. It seems far from being obvious or automatic that once countries and companies cooperate on a given kind of capability, they will build on this relationship and eventually evolve into an integration process at the European level. As long as cooperative programs remain based on an intergovernmental approach, the hybrid nature of the European armament market looks set to remain—even though such programs can lead to an industrial consolidation between some participating companies, there is no integration on the demand side or at the level of industrial assets through specialized centers across Europe.

Each arms-producing country expects to keep (or acquire) as many competences as possible on its territory. This duplication risk was demonstrated once again when France and Germany disagreed on the sharing of competencies regarding FCAS project. Rather than favoring a cross-border specialization, discussions revealed that each country still wanted to master domestically the whole range of competencies, thus being able to go alone if necessary. This example echoes the reason why Thyssen Krupp Marine Systems had to demerge with Swedish shipyard Kockums, since Sweden had feared that the German shipyard would sacrifice some local competencies and deprive Swedish Navy from a fully-capable domestic supplier.[25]

24 France and Germany launched a FCAS project in 2017 eventually joined by Spain two years later. The United Kingdom announced the Tempest programme in 2020 in association with Italy and Sweden, enlarged to Japan in 2022.
25 Bellais (2017a).

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We should keep in mind that cooperative programs are opportunistic by nature on both sides of the market. On the demand side, states look for a second-best solution to overcome the dilemma between strategic autonomy and budget constraint. However, this dilemma no longer exists if states renounce strategic autonomy. This most notably occurs through off-the-shelf acquisition, or if they can afford developing a purely domestic solution as long as they accept a lowering of their ambitions (e.g., Gripen combat aircraft in Sweden).

Moreover, the political nature of defense cooperative projects explains that failure is more frequent and less costly than in civilian projects. Indeed, cooperative programs represent peer-based programs, with limited commitment since they are non-binding agreements with only political exit costs.

A good illustration of the limits of intergovernmental cooperation in progressing toward an integrated European armament market is the "Letter of Intent" (LoI), a document signed in 1998. France, Germany, Spain, the United Kingdom, Italy, and Sweden, which were the six largest arms-producing countries in Europe, proposed to facilitate European defense industry restructuring. It became a framework agreement in 2000 and an international treaty in 2003. The LoI aimed to act mainly as a forum where country representatives could discuss harmonization and identify joint priorities.

Unfortunately, this forum was not able to deliver any significant progress with regard to the six domains on which it was supposed to work[26]. In all of them, progress was limited to either bilateral negotiations[27] or initiatives from the European Commission (e.g., the Code of Conduct regarding exports). The failure of LoI, despite initial strong political will, underlines that states are not able, or lack the determination, to move from a domestic armament market to a truly European one. Since states engage into cooperative program as the second-best solution to preserve their DTIB, such cooperation is conditioned by this constraint. This means that any cross-border organization based on European cooperative programs can be undone as soon as a better solution becomes available.

If links are weak on the demand side, they are even weaker on the supply side. Most companies are not keen to participate in a cooperative program—with most of these programs being initiated and organized by states, with companies having no choice but to join if they want to remain in the armament market. Quite often the imposed industrial consortia encompass their competitors with similar competencies; a situation which is vastly contrary to civilian projects undertaken on an industrial rationale where companies choose to work together because they share strategic stakes.

In addition, links created through a cooperative program are based on a workshare inside an ad hoc value chain. Once this program ends, there is no reason for participating companies to continue to work together. Most of the time, such cooperation does not result from a strategic commitment but from political necessity with companies designated as "national champions". Rather than companies working together for industrially strategic reasons (as in the civilian sector), intergovernmental cooperative programs put together companies that have not considered a strategy together, have not necessarily worked together before, and could even be competitors in side markets or even in the same market before and/or after the program. The NH90 helicopter provides a good example of such a situation. This program gathered two prime companies, AgustaWestland (now Leonardo Helicopters) and Eurocopter (now Airbus Helicopters) because they were designated as national champions by Italy and France. However, these companies were (and still are) fierce competitors in both civilian and military markets, rendering both eager to get their freedom back as soon as possible; making cooperation difficult and rendering any integrative benefit of such a program improbable.

26 Namely, Security of information and mutual procedures, Standardization of contracting procedures (including IPRs), R&T priorities and establishment of joint military needs, Export control with the principle of a global license by project, and Procurement safety (especially in case of restructuration).

27 For example, the Lancaster House treaty between the United Kingdom and France, and the Aachen treaty between Germany and France.

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Even in the example of MBDA, the degree of cross-border integration appears limited.[28] Even though the missile industry has benefitted from the political incentives to organize an integrated French-British industrial network, the "One MBDA" process remains incomplete. Each country asked to keep a nucleus of skills and knowhow in each critical domain in case the bilateral cooperation ceased.

It is demonstrated that intergovernmental cooperative programs do not provide sufficient incentives, on both demand and supply sides, to build an integrated European market. Any step toward some level of integration can be reversed if an alternative approach becomes possible or if an existing cross-border relation is not cemented with sequential programs—without launching a next-generation project, it is likely that the cooperation between participating states, and even more so between companies, will dry up once the initial capability has been delivered.

Lessons learnt and the design of European Union defense industrial policy

The European Commission has become increasingly involved in European cooperative programs since 2016. This community funding could become a game changer since it could disrupt the hybrid nature of the European armament market by favoring a stronger integration.[29] Nevertheless, cooperative programs are not an end in themselves, they ought to constitute a means to irreversibly achieve cross-border integration and so progress toward a truly European DTIB.

New European Union tools, new market rules?

The hybrid nature of the European armament market hinders the effectiveness of the supply side and increases costs for states. Even though EU states have favored cross-border links, integration remains unachieved and cannot be compared to a full consolidation of the defense industry across the main arms-producing countries—not to mention the persistent fragmentation on the demand side. The European Commission made such an assessment as early as the middle of the 1990s with the Bangemann Communication[30] but was prevented from interfering with state policies. As Jean-Pierre Darnis states, "functionalist integration does not work for defense, because the monopoly of violence is not shared, or only marginally."[31]

This is the reason why the European Commission has changed its approach to encourage a transformation of the European armament market. Since 2016, it has set up financial tools providing incentives to behave according to the Commission's vision regarding the evolution of the European armament market on both the supply and demand sides. Such incentives can work if, and only if, states and companies accept community funding. Resistance is possible, but the new geostrategic context is favoring a more flexible approach from states. The Russian invasion of Ukraine has provided a need for greater military efforts, paving the way for a larger role for community funding.

The European Defence Fund (EDF) was initiated in 2016 with a first call in 2021, but its role seems to have become more and more important since the February 2022 Russian invasion of Ukraine. This fund was conceived as a means to improve the effectiveness of the European defense industry, which in large part consists in overcoming the limits of intergovernmental cooperative programs. It represents an opportunity to set up incentives to base cooperation upon an industrial rationale by choosing new eligibility rules for projects.

The EDF gives access to community funding that aims to complement national R&D spending. Admittedly its budget is only EUR 8bn for the period 2021–2027, significantly below the initial ambition of EUR 13bn. This represents an average yearly budget of EUR 1.14bn, which is significant but remains limited compared to member

28 Bellais (2022)
29 Bellais and Fiott (2017)
30 See *The Challenges facing the European defense-related industry, A contribution for action at European level*, COM(96) final, Brussels: Commission of the European Communities, 24 January 1996.
31 Darnis (2021, p. 7)

states' total investment of EUR 9.2bn in 2021 alone. Its impact is likely further limited because EDF funding will be spread over all EU countries whereas two of them account for 96 percent of defense R&D in Europe.[32]

However, community financing will either reduce the budget constraint for participating countries, encouraging them to cooperate on new projects for which there were previously no funds available either multilaterally or domestically.

Beyond an additional funding, the EDF aims to increase the effectiveness of expenditure by encouraging participating countries to pool their efforts. Its eligibility rules promote the consolidation of existing centers of excellence in Europe by selecting partners on the "best athlete" principle and not according to their nationality. By strengthening these centers rather than duplicating them, these rules are likely to favor the specialization across Europe necessary to converge toward a European DTIB and achieved the critical mass required to guarantee the sustainability and effectiveness of such centers. The EDF may be a vector of efficiency for public spending by effectively promoting consolidation of industrial assets.

The involvement of the European Union in cooperative programs could help to avoid the limits and stalemates experienced through intergovernmental cooperative programs. The European Commission can act as a third party with the ability to put in place effective rules and arbitrate among stakeholders to limit counterproductive behaviors. Indeed, lessons learnt from past projects provide clear guidance about how cooperation ought to be organized.

Four dimensions can be identified. First, it is important to avoid viewing cooperation as a last resort for when domestic programs are no longer affordable or manageable—cooperating must be the starting point.

Second, states have to converge their operational needs and approach before launching a cooperative program to reduce divergences or incompatibilities in technical specifications. This may be difficult to achieve where states have identical legitimacy to request national specificities in exchange to their participation. The European Union could achieve better results since EDF-funded projects are supposed to respond to military needs identified through the Permanent Structured Cooperation (PESCO[33]).

Third, critically many intergovernmental cooperative programs failed or faced major troubles because of a loose or ineffective industrial organization. It is therefore important to organize the industrial side of cooperative programs on industrially-sound criteria similar to those of successful of civilian cooperative programs for complex systems. Lessons learnt provide four critical rules:

- Design a clear industrial leader architect/integrator as a decision-maker, judged on milestones and outcomes, to avoid being stuck between same-level peers with conflicting interests (often backed by their domestic authorities).
- Select industrial partners based on the "best athlete" principle rather than on juste retour to minimize the number of weakest links throughout the value chain. This helps overcome *relational* complexity usually experienced by traditional state-led projects.[34]
- Give the integrator margins of maneuver to propose technical adjustments and manage the supply chain smoothly (no political/administrative interference), which helps minimize the *task* complexity usually experienced.[35]
- Favor a work-share allocation that reinforces existing centers of excellence rather than duplicating competencies in new facilities elsewhere. Such duplication engenders risk of failure or under-performance and is likely to create

32 In 2021, France spent €6.8bn and Germany €2.0bn in defense R&D. The Netherlands is the third largest spender but only invested €148m.
33 Established in 2017, this state-level mechanism allows willing and able member states to jointly plan, develop and invest together by committing to binding projects. See https://www.eeas.europa.eu/eeas/permanent-structured-cooperation-pesco_en
34 Ford (2015)
35 Ford (2015)

"industrial zombies" after program completion because of a de facto overcrowded market.

Fourth, since community-funded projects will remain intergovernmental programs in their implementation, it is appropriate to use a third-party institution to pilot these projects and stabilize national commitments. The European Commission could play such a role, assuming it has the suitable technical competencies, but it seems improbable in the short run. As such, it should rely on existing specialized institutions, on the model demonstrated by the European Space Agency regarding space programs; these can be either international project agencies (e.g., ESA, OCCAr)[36], or national acquisition agencies acting on behalf of the European Union. This last configuration may seem surprising, but it worked effectively for the Meteor missile program where the United Kingdom managed the program through its national procurement agency but to the benefit of all participating countries.[37] The issue is identifying, on an ad hoc basis, the institution that has required expertise.

Cooperation vs integration? The European dilemma

As Daniel Fiott underlines:

> "*The Commission's enhanced role in defense is not just a question of institutional arrangements and remits. Rather, the presence of the Commission raises a fundamental question about the very soul of EU defense cooperation—should it proceed in an intergovernmental fashion as it has done in the past, or is a more communitarian approach desirable in order to break through intergovernmental deadlock?*"[38]

The new community dynamics represent a positive evolution to support a stronger mutualization of defense efforts and a more effective use of public spending for Europeans. Nevertheless, the chosen approaches underline the limits to the hybrid nature of the European armament market. Indeed, the European Commission aims to foster cooperation in both the demand and supply sides—suggesting that the European armament market is likely to remain fragmented despite efforts to promote an integrated market.

There is a contradiction in the desire to generate a European DTIB while the using of financial tools that reward a cooperative approach that supports the classical intergovernmental framework. As such, the European armament market is likely to fall into the same trap again and again that prevents Europe from leveraging on projects to build an integrated market.

This is especially obvious on the supply side. The implementation of new EU tools is based on rules that prevent a trans-European company from proposing different national subsidiaries under separate national flags because projects must gather unconsolidated companies from multiple countries. This was driven by requests from states wanting to secure the participation of domestic companies rather than foster trans-European consolidation that may negatively affect their own DTIB. So the rules appear contradictory, with the objective being integration but the chosen means to achieve this in fact encourages fragmentation to secure community funding. While this criterion is in line with the objective of opening up value chains, by integrating companies from other countries in EU-funded projects, community funding must encourage the links between domestic DTIBs. However, this principle contradicts the pre-existing company efforts to overcome national boundaries and create trans-European suppliers. Paradoxically, from the late 1980s to 2016, companies such as Thales, Airbus, MBDA, Leonardo, and BAE Systems had their desire to consolidate assets in Europe blocked by national states' restrictions imposed to preserve their domestic DTIB. As such, EU policy promotes cooperative projects to promote the creation of a European DTIB while simultaneously

36 The European Space Agency and the Organisation for Joint Armament Cooperation
37 Bellais (2022)
38 Fiott (2019, p. 4)

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sanctioning trans-European companies that have already achieved a certain degree of cross-border integration.

Comparisons can be made with similar situations in international economics. Globalization can be understood from two perspectives.[39] First, that globalization simply represents an intensification of trade flows between countries with more globalization simply meaning that flows are denser without transforming industrial bases in each country (as it was the case for globalization before 1913). Second, that globalization is a transformative process when cross-border flows reflect a deeper integration between national industrial bases through the globalization of companies themselves, and the internationalization of value chains. As summarized in Table 1, apparently similar features of internationalization actually reflect fundamentally different dynamics.

Table 1: Internationalization vs globalization

Internationalized economy	*Globalized economy*
The world is the sum of interdependent nations	The world is integrated with decaying frontiers
Focus on the interdependency and cooperation between states that master the regulation of international interactions	Focus on the integration and the diminishing role of states in favor of companies, markets and global regulations
Economies keep national specificities	Companies' specificities are independent from their home country
Flow indicators: international trade, foreign direct investment etc.	Indicators of economic or social convergence: prices, specialization preferences, institutions etc.
Cyclical evolution of free trade and reversible choices	Irreversible evolution toward the integration of domestic markets

Source**:** Adapted from Siroën, JM, 2004. The international is not the global: For a reasoned use of the concept of globalization. *Journal of Political Economy* , pp. 681–698.

It is likely that even with the community funding, cooperative programs will become an end rather than a means to achieve another step in the organization of the European armament market. Cooperative programs can make sense as a means of strengthening of European strategic autonomy only if they are the prerequisite for the integration of both demand and supply sides. In fact, this was the case in the past for key capabilities like helicopters, missiles, or mission aircraft. Participating states had accepted that a cooperative program led to industrial consolidation and some cross-border specialization. Nevertheless, such integration cannot be taken for granted as they require that new intergovernmental programs must nurture the resulting industrial base, which would otherwise wither and decay.

In fact, the European Commission is learning from the initial steps of its new tools, but it is important to learn fast and quickly evolve associated rules to avoid the "cooperation for the sake of cooperation" trap. Even if EDF rules introduce positive innovations for more effective cooperative programs and stronger integrative dynamics, it is important that the implementation of EDF does not stealthily reintroduce a kind of juste retour because of the reliance on intergovernmental projects. The experience of OCCAr proves that even relevant rules ("global balance"[40]) could result in an inappropriate implementation. In fact, OCCAr member states did not renounce the analytical calculation

39 Siroën (2004)

40 According to OCCAr policies, member states have replaced juste retour "by the pursuit of an overall and flexible multi-programme/multi-year balance of work share against cost share: the concept of global balance" (https://www.occar.int/policies-methods).

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of industrial juste retour on a program-by-program basis—so the implementation of cooperative programs remains marred with this rule.

As the implementation of EDF only started in 2021 it is difficult to assess whether the European Commission was able to change the rules of the game. The limited implementation of the 2009 directives, especially regarding public markets,[41] leads one to look closely for any bias that may diminish the integrative power of this tool. It is also important to learn from these preliminary experiences to support the design of effective rules and implementation processes for EDIP and future mechanisms. In other words, the initial approach of EDF should not be an end but a first step toward a more ambitious process fostering the integration of national DTIBs at the European level. This supposes that the European Union and member states accept another form of hybrid market at the European level, which requires an adequate regulation already proposed when the LoI was launched. The EU space policy underlines that such an evolution could be difficult but not impossible.

Conclusion

Cooperative programs have been a critical feature of the European armament market for decades, and it is likely to remain so in forthcoming years because this approach appears necessary in a hybrid market (for political and sovereign motives). European countries try to preserve their local DTIB guaranteeing a domestic security of supply but also to minimize costs by gathering resources on both demand and supply sides. Therefore, cooperative programs are the only answer, even though they represent a second-best solution.

The European Commission represents a newcomer in this complex market organization. It aims to induce countries to go further in terms of European integration on both the demand (e.g., EDIRPA[42] and EDIP) and supply (e.g., EDF) sides. Paradoxically, this is executed through cooperative programs and could result in a kind of arrested development for a European armament *marché unique*. In order to avoid such a "cooperation trap," it seems necessary that the European Commission clarifies how cooperative programs are expected to promote the emergence of a genuinely European DTIB, i.e., an integration of domestic DTIBs rather than interconnections of a sometimes temporary nature.

Even though defense remains in the realm of states (as defined in Article 346 TFUE), recent evolutions have revealed that what was considered previously impossible can become acceptable given a favorable context. The European Commission was able to launch the EDF to improve the effectiveness of the defense industry in 2016, and subsequently proposed EDIRPA and EDIP to induce states to join acquisition efforts after the Russian invasion of Ukraine in 2022. There is an opportunity here, community funding ought to be accompanied by rules that create permanent and not temporary connections between national DTIBs, along with strong incentives that prevent states from reversing these dynamics. The European armament market is likely to remain a hybrid market for political reasons, but requires moderation of the damaging side effects that accompany this original market configuration.

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41 Maulny, Simon and Marrone (2020)

42 The European Commission's European Defence Industry Reinforcement through common Procurement Act. A short-term joint defense procurement instrument worth EUR 500mn.

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