The European difficult goal of being strategically autonomous

Abstract

The issue of the “strategic autonomy of the European Union (EU)” is being subject to high interest within the EU policy circles. This term, originally propelled by France and mainly focused on defence, has evolved to include a much broader set of security considerations as the economy, the health or technology to just name a few. However, this concept still retains an important defence dimension.

This paper deeply explores this issue, mainly in relation to the defence dimension, but looking at the organizational, industrial and technological aspects which are closely related, trying to identify the different constraints that may bound or endanger this autonomy.

Key words: defence, industry, autonomy.

1. Introduction

One of the main outcomes of the development of the Common Security and Defence Policy (CSDP) has been the document named Global Strategy for the European Union’s Foreign and Security Policy where the level of ambition of Europe on this subject was outlined. This policy states as one of the EU main goals
to be strategically autonomous in defence. This concept, rather old in military affairs, is considered key by many scholars in an anarchic or hobbesian world where nations shall help themselves to protect their interests when they collide or are incompatible with the interests of other nations. Whereas autonomy was searched nationally in the past, considerable advantages are achieved when partners ally and join forces for defending against a similar threat and it may be essential when these threats cannot be properly faced with domestic resources.¹

Nevertheless, autonomy is an ambiguous term that has different meanings, which demands a more accurate definition. A first one could be to have non-dependence on decisive issues, in other words to have freedom to act in key situations. A second one could be the ability to govern ourselves without external interferences. Whereas these definitions are quite intuitive, this paper will use, the concept coined by the EU Council that states it as “the ability to act autonomously when and where necessary and with partners whenever possible, in all matters of strategic significance” (European Council, 2016). Having a good autonomy means, therefore, the ability to operate alone, when partners and allies are unavailable for achieving certain goals as can be the protection of the European territory from invasion or the projection of peace and security elsewhere.

Being able to operate autonomously means that a set of military capabilities must be ready to perform the missions demanded by the CSDP. Such capabilities are composed of human resources and equipment as well as adequate procedures (usually named military doctrine) for executing the mission effectively and efficiently. In this sense, a detailed description of the defence goals, operations and missions is rather helpful for setting the roadmap that shall be followed for achieving the named capabilities.²

The design, development and production of such equipment require a proper technological and industrial base, able to obtain equipment with adequate functional and performance features that provide operational advantages and surpass, in case of using the force, the opposition of any potential adversary. This infrastructure shall be able to supply and maintain such equipment at an adequate rate to have the enough amount that forecasted missions demand, considering the level of attrition of a potential conflict.

This chapter aims to analyse the European capacity to be truly autonomous. The main finding is that such ambition demands a set of conditions hardly achievable under the current landscape. In particular, the arrangement of institutions, frameworks and programmes with enough resources and political support –to orchestrate the required technological and industrial base– seems to be insufficient. Yet, before starting such analysis, a brief description of the defence industry and defence cooperation will aid to understand the reasons that lay behind the named finding.

¹ This term “strategic autonomy” is the subject of great interest and debate in European policy circles as indicated by the number of documents produced, such as European Political Strategy Centre (2019), European Parliament (2016), Järvenpää et al. (2019), Lippert et al. (2019), European Parliament (2020), Anghel et al. (2020), Borrell (2020) and Mauro (2021), to cite only a few.

² A description of the process of developing such military capabilities can be found in Martí (2023).
2. **The defence industry**

The definition of the defence industry is complex because the armed forces require a large set of goods and services that involve many industrial activities. Yet, the most relevant defence items are those considered critical in military operations, typically encompassing a variety of different systems and equipment designed for use on land, at sea, in the air or even in space. These systems usually include weapons for neutralizing potential adversaries, as well as information and communication systems for commanding and controlling operations. These systems are often the most expensive and their acquisition and maintenance devour a substantial portion of the defence budget.

The industrial and technological base that provides such items is characterised by a set of features summarized in the following lines.

1. Products are usually complex and demand the intensive use of sophisticated technologies, as well as a large supply chain (Prencipe *et al.*, 2003).
2. Research, development and innovation are crucial for attaining the required technologies in a very competitive global defence goods market.\(^3\)
3. Large economies of scale, scope and learning apply to this industry, meaning that unit costs decrease with the number of units produced (Martí, 2015).
4. Competitiveness is relatively imperfect due to product specialisation, low and irregular demand, and entry barriers that reduce the numbers of firms capable of supplying these items nationally.
5. The strategic nature and imperfect competition in this market forces strong regulation.

These features have two consequences. First, given the complexity and uncertain nature of the development of new equipment, government assistance is required to mitigate the substantial business risk that the firm would bear when attempting this task independently (Marshall & Meckling, 1962; Sutton, 2001). Additionally, the relatively low domestic demand for these products compels nations to export them to achieve the economies of scale mentioned earlier or to transfer the associated technologies to other civilian sectors whenever feasible.

3. **The problem of defence cooperation**

One of the main challenges of defence planning is determining the necessary military capabilities to address conflicts that may require the use of force. Based on these capabilities, the armed forces can define the set of products and services required to achieve operational success. This process is subject to a high degree of

\[^3\] The impact of defence R&D on equipment quality is analysed in Middleton *et al.* (2006).
uncertainty, as future threats and potential vulnerabilities are hard to define and evaluate through prospective analysis. Consequently, States typically approximate these capabilities, often relying on rules-of-thumb such as analysing the defence expenditures of allies and adversaries, understanding the capabilities of potential adversaries, as well as their own, and assessing the perceived level of threat.

Using this information, they estimate a procurement list of necessary equipment and services, taking into consideration anticipated operations in the event of a threat materializing. The specifications for these equipments and services are determined based on their anticipated performance in operational scenarios. Subsequently, the defence industry explores solutions and technologies to meet these functional and performance requirements within a budget affordable from the defence budget.

This planning process allows to identify gaps and vulnerabilities in forecasted capabilities and the degree of autonomy achieved, particularly when certain equipment or services must be sourced from foreign suppliers, such as the USA. This exercise is important because the choice of defence objectives and missions play a significant role in accurately defining the desired level of autonomy.

While each Member State typically conducts this exercise independently, the complexity increases when defining desired capabilities within an alliance, as is the case with the European Union. This is because Member States have varying perceptions of threats. For example, States in Central and Eastern Europe are more concerned about the threat posed by the Russian Federation, while Mediterranean States focus more on the permeability of the European Southern border and instability in Northern Africa due to poverty and population growth. Furthermore, States may have different visions and priorities as can be Sweden leaning toward a more peaceful stance, France oriented toward playing an international role, Germany focusing on Europe and countries like Poland and the Baltic States relying on North Atlantic Treaty Organization (NATO) capabilities to face the eastern threat. These varying perceptions can harden consensus regarding capabilities and requirements when operational doctrines differ. Ultimately, they may hinder common procurement efforts.

Cooperation in this field faces additional challenges, including:

1. The necessity to synchronize national procurement schedules, considering the long lifespan of these equipments.
2. The requirement for joint operations, which compels Member States to develop equipment capable of interoperating with allies. Achieving the proper definition of standardized communication and data interfaces, a complex and recurrent task, becomes crucial, for sharing and exchanging the large amount of information needed.
3. Differences in defence budgets among nations due to varying assessments of defence needs. While the principle of solidarity calls for nations to make a fair contribution to defence, this is not consistently observed across Europe. Although an agreement was reached at the NATO Wales Summit to allocate
more than 2% of GDP to defence, many Member States have not met this commitment, as shown in the figure below.

**FIGURE 1**
PERCENTAGE OF GROSS DOMESTIC PRODUCT (GDP) ALLOCATED TO DEFENCE IN 2022

[source: North Atlantic Treaty Organization.]

3.1. The development of the EU institutional framework

The European Member States have been working on developing the institutional framework necessary for the European defence. This process began with the signing of the Maastricht Treaty in 1992. However, the process has been painfully large due to the fact that defence is a core State responsibility, making the relinquishing of sovereignty for this purpose a costly endeavour that requires complex negotiations to achieve minimal consensus. Nevertheless, despite such slowness, Member States have managed to develop this framework.

Key milestones in this process include the creation of the Policy and Security Committee (PSC), the Military Committee (EUMC) and the Military Staff (EUMS) in 2001, the establishment of the European Defence Agency (EDA) in 2004, the signing of the Lisbon Treaty in 2007, which formalised the Common Security and Defence Policy, the creation of the European External Action Service in 2010 and the approval of the European Union Global Strategy (EUGS) in 2016, which serves as a fundamental reference for the development of European defence capabilities.

Regarding the defence industry two important directives were published “on defence procurement” (2009/81/EC) and “on the intra-community trade of military materiel” (2009/43/EC), which were followed by the Communication from the Commission “Towards a more competitive and efficient security and defence sector” (European Commission, 2013).
Another important step was the creation of the European Defence Action Plan (EDAP), which included the European Defence Fund as one of its main instruments.\textsuperscript{4} The primary aim of this Fund is the development of the European capabilities through the financing of joint Research and Development activities. It has a budget of 7,953 million euros for the period 2021-2027.\textsuperscript{5} One third is allocated to research projects, while the remainder supports development projects, with the financing (around 20\%) shared with Member States. This Fund develops a yearly work programme made in collaboration with Member States, the EU Foreign Service and the European Defence Agency.\textsuperscript{6}

The subsequent development was the creation of the Permanent Structured Cooperation (PESCO) (Fiott \textit{et al.}, 2017; Zandee \textit{et al.}, 2021) in December 2017, in which Member States signed more binding commitments related to European defence. It has resulted in over than sixty-eight joint development projects. PESCO also includes Capability Development Plans (CDPs) and the Coordinated Annual Review of Defence (CARD), with the aim of achieving the European military capabilities goals. In 2020, the Directorate General for Defence Industry and Space (DG DEFIS) was established for managing this Fund. In 2022 the \textit{Strategic Compass} was published, providing direction for the EU security and defence policy until 2030 by setting relevant goals and timelines for military capabilities after analysing the threats and challenges facing Europe (Fiott, 2021).

Finally, following the Russian invasion of Ukraine, new financial aids are being arranged for joint procurement and equipment development as well as ammunition procurement, under initiatives such as the European Defence Industry Reinforcement through common Procurement Act (EDIRPA), European Defence Investment Programme (EDIP) and Act in Support of Ammunition Production (ASAP) which was approved by the European Parliament in July 2023.

While this institutional framework is favouring a more coordinated European defence, fundamental strides are still needed. For example, the intergovernmental nature of the Common Foreign and Security Policy (CFSP) means that any decision requires unanimous agreement of Member States, resting agility to a crisis response. Additionally, a comprehensive institutional agreement for creating a true European army, capable of quickly facing a conflict is still lacking. Initiatives like “pooling and sharing” have had limited effects, with the European Air Transport Command (EATC) being one of the main achievements. Finally, the current allocation of resources for defence appears insufficient to achieve the desired autonomy in terms of advanced equipment, number of units or overall capabilities. This issue is explored in greater detail in the next section.


\textsuperscript{5} This amount is expected to be increased to 9,500 million euros during the mid-term review of the Multiannual Financial Framework.

\textsuperscript{6} Other complementary actions include the Action plan on synergies between the civilian, defence and space industry (European Commission, 2021).
3.2. The available EU defence capabilities

The development of the EU defence capabilities is a relatively new process, as the CFSP was only forged in the Maastricht Treaty, which demanded the collaboration of Member States to sustain this policy. Yet, a Headline Goal on this issue was not agreed upon until 1999, and the mechanism for its coordination only began to materialise in 2016.

Despite the effort made so far, Europe lacks or has limited capabilities in areas such as force projection, effective engagement, intelligence, command and control or nuclear weapons, needing support of the United States through the NATO framework. This dependency has become evident in the recent conflicts in the former Yugoslavia, Kosovo, Libya, Syria, Mali, the fast and uncoordinated retreat in Afghanistan or NATO’s reinforcement of the eastern flank of Europe following the Ukraine invasion. In fact, the first review of the Capability Development Plan identified numerous capabilities shortfalls given the stated level of ambition (Brzozowski, 2020).

To illustrate the quantitative disparity in capabilities, Fiott (2018) reported that in 2017, Europe deployed only 52,000 personnel for foreign missions conducted by the EU, NATO, the Organization for Security and Co-operation in Europe (OSCE), United Nations (UN) and other and other organizations, compared to the 208,000 deployed by the USA. In other words, Europe’s deployment was only one-fourth of the USA’s, despite a budget difference of close to one-half.

Several factors contribute to these weaknesses. First, there is a reluctance among EU Member States to allocate resources to defence, as shown in Figure 1. European defence spending, 214,319 million euros according to European Defence Agency (2018), is considerably lower than that of the United States, 821,830 million dollars. It’s worth noting that acquiring the military capabilities necessary for complete autonomy from our main ally, the United States, appears especially challenging, as highlighted in the report by Barrie et al. (2019). This report analyses two hypothetical scenarios in which Europe is responsible for its defence without American support, concluding that the EU would require between one to two decades to achieve reasonable autonomy, with an investment of no less than 375,000 million euros.

Second, the USA allocates nearly 33% of its budget to modernize equipment (European Political Strategy Centre, 2015), while Europe invest only 21% for this purpose. Third, the slow growth of European economies and the increasing cost of other social needs (e.g. pensions or healthcare) make it difficult to increase the defence budget, unlike countries like China, which often experiences double-digit growth rates.

Fourth, the preference of many Member States to purchase foreign equipment, usually from the USA, for reasons of interoperability, compatibility or strengthening

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The current stock of nuclear weapons available in France and the United Kingdom is considerably smaller than the owned by the Russian Federation. A detailed analysis of current weaknesses can be found in (Martí, 2020a; Giegerich & Hackett, 2022).
defence partnership, does not favour such autonomy, as F-16 by Poland or F-35 by Germany to the USA.

Furthermore, EU military capabilities suffered a significant loss with the Brexit, considering the size and preparedness of UK’s armed forces and its substantial defence investments, which exceeds other EU States as shown in the previous table (Barrie et al., 2018; Sartori et al., 2018). While the collaboration of the United Kingdom in some crisis and conflicts, whose threats are shared with other Member States, could be accounted for, this collaboration will require specific mechanism outside the European defence institutional framework. The signing of the Aukus agreement in September 2021 also indicates the cooling of relations among the UK and the EU.

4. The European Defence Industry performance

Certainly, the achievement of autonomy demands a technological and industrial base (DTIB) capable of developing, supplying and maintaining the advanced equipment needed by defence, a topic that this section addresses. The European DTIB still ranks as the second larger in the world. However, it is unevenly distributed across Europe. The wealthier and more advanced Member States have a larger DTIB, as is the case of UK (now outside the EU), France, Germany and Italy, which is followed by Sweden and Spain. Poland and Holland also have substantial DTIBs. In contrast, the DTIBs of the remaining Member States are relatively small. The large size of France and the United Kingdom’s DTIB can be explained by their status as Great Powers after World War II, with significant colonial empire worldwide, which meant Armed Forces for its sustenance. While these empires have largely ended, both nations still sustain wide-ranging interests globally and the need to project forces outside Europe, such as Africa.

According to Aerospace, Security and Defence Industries Association of Europe (ASD) 2022 report, the revenues of the sector in 2021, including the UK, amounted to 118,000 million euros. This amount represents only 2.27 % of sold industrial production in the European Union. The sector employs 467,000 persons, accounting for 1.45 % of total employment. Exports amounted to around 45,100 million euros, with some of these values representing intracommunity commerce. The following list shows the most important firms (Table 1).

As can be seen in the table, BAE Systems, Leonardo, Airbus and Thales are the biggest ones, collectively accounting for one half of the European defence revenues. These firms shall be considered global players rather than solely European ones (Belin et al., 2017). The table also indicates that other European firms have less significant positions in the Top 100 list of defence industry companies. Furthermore, many of these firms originate from the United Kingdom, highlighting the substantial loss of industrial assets after Brexit.
TABLE 1
SIPRI TOP 100
(million dollars)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Country</th>
<th>Arms Sales</th>
<th>Total Sales</th>
<th>Arms sales as a % of total sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>BAE Systems</td>
<td>United Kingdom</td>
<td>26,020</td>
<td>26,851</td>
<td>97</td>
</tr>
<tr>
<td>12</td>
<td>Leonardo</td>
<td>Italy</td>
<td>13,870</td>
<td>16,716</td>
<td>83</td>
</tr>
<tr>
<td>15</td>
<td>Airbus</td>
<td>Trans-European</td>
<td>10,850</td>
<td>61,671</td>
<td>18</td>
</tr>
<tr>
<td>16</td>
<td>Thales</td>
<td>France</td>
<td>9,770</td>
<td>19,149</td>
<td>51</td>
</tr>
<tr>
<td>19</td>
<td>Dassault Aviation Group</td>
<td>France</td>
<td>6,250</td>
<td>8,554</td>
<td>73</td>
</tr>
<tr>
<td>24</td>
<td>Safran</td>
<td>France</td>
<td>5,050</td>
<td>18,043</td>
<td>28</td>
</tr>
<tr>
<td>26</td>
<td>Rolls-Royce</td>
<td>United Kingdom</td>
<td>4,970</td>
<td>15,058</td>
<td>33</td>
</tr>
<tr>
<td>27</td>
<td>MBDA</td>
<td>Trans-European</td>
<td>4,960</td>
<td>5,007</td>
<td>99</td>
</tr>
<tr>
<td>29</td>
<td>Naval Group</td>
<td>France</td>
<td>4,740</td>
<td>4,793</td>
<td>99</td>
</tr>
<tr>
<td>31</td>
<td>Rheinmetall</td>
<td>Germany</td>
<td>4,450</td>
<td>6,691</td>
<td>66</td>
</tr>
<tr>
<td>34</td>
<td>Saab</td>
<td>Sweden</td>
<td>4,090</td>
<td>4,566</td>
<td>90</td>
</tr>
<tr>
<td>43</td>
<td>Babcock International Group</td>
<td>United Kingdom</td>
<td>3,100</td>
<td>5,642</td>
<td>55</td>
</tr>
<tr>
<td>44</td>
<td>KNDS</td>
<td>Trans-European</td>
<td>3,030</td>
<td>3,193</td>
<td>95</td>
</tr>
<tr>
<td>46</td>
<td>Fincantieri</td>
<td>Italy</td>
<td>2,980</td>
<td>8,173</td>
<td>36</td>
</tr>
<tr>
<td>47</td>
<td>CEA</td>
<td>France</td>
<td>2,940</td>
<td>6,565</td>
<td>45</td>
</tr>
<tr>
<td>55</td>
<td>ThyssenKrupp</td>
<td>Germany</td>
<td>2,390</td>
<td>40,226</td>
<td>6</td>
</tr>
<tr>
<td>61</td>
<td>Serco Group</td>
<td>United Kingdom</td>
<td>1,870</td>
<td>6,414</td>
<td>29</td>
</tr>
<tr>
<td>69</td>
<td>Hensoldt</td>
<td>Germany</td>
<td>1,610</td>
<td>1,743</td>
<td>92</td>
</tr>
<tr>
<td>72</td>
<td>QinetiQ</td>
<td>United Kingdom</td>
<td>1,510</td>
<td>1,816</td>
<td>83</td>
</tr>
<tr>
<td>76</td>
<td>PGZ</td>
<td>Poland</td>
<td>1,430</td>
<td>1,584</td>
<td>90</td>
</tr>
<tr>
<td>87</td>
<td>Melrose Industries</td>
<td>United Kingdom</td>
<td>1,190</td>
<td>10,311</td>
<td>12</td>
</tr>
<tr>
<td>91</td>
<td>Navantia</td>
<td>Spain</td>
<td>1,080</td>
<td>1,544</td>
<td>70</td>
</tr>
<tr>
<td>98</td>
<td>Ultra Electronics Group</td>
<td>United Kingdom</td>
<td>920</td>
<td>1,170</td>
<td>79</td>
</tr>
<tr>
<td>99</td>
<td>Diehl</td>
<td>Germany</td>
<td>870</td>
<td>3,745</td>
<td>23</td>
</tr>
<tr>
<td>100</td>
<td>Meggitt</td>
<td>United Kingdom</td>
<td>850</td>
<td>2,048</td>
<td>42</td>
</tr>
</tbody>
</table>


Examining the 2022 Stockholm International Peace Research Institute (SIPRI) report, it can be seen that the USA firms represent 50.5 % of total sales, Chinese firms represents 18.4 %, while European firms accounted for 18.8 %. This data underscores that European defence industrial capabilities are nearly on a par with China’s. In contrast, Russian firms represent 3 %, signalling a clear decline in Russia’s defence technological and industrial assets.

Behind these large European firms there are around one hundred firms of medium size and around 1,350 Small and Medium Enterprises (SMEs), according to the European Commission report (Ballester, 2013). These firms collaborate in the supply chain of the products and services delivered by the largest firms, which
are the main defence contractors. Their combined revenues were estimated around 36,000 million euros.

4.1. **Capabilities by sectors**

The aerospace sector includes the manufacturing of fixed and rotary wing aircraft for combat, transport, training and air refuelling, as well as engines, missiles and space systems. The main firms in this sector are BAE Systems, EADS, Dassault Aviation, Eurofighter GmbH and Saab. Helicopter manufacturers include Augusta/Westland y Eurocopter. Alenia Aeronautica is a less prominent entity in this field. Engines are primarily produced by Rolls-Royce (UK) and Safran, with two smaller firms, MTU and Avio, also contributing. The MBDA group ranks as the world’s second largest missile manufacturer.

The military electronics sector involves the production of systems for air defence, radars, sonars, night vision equipment, navigation systems, avionics and command, and control and communications systems. Notable companies in this sector includes Thales and Selex Sistemi Integrati (a part of Leonardo group), along with Indra, Ultra and Selex Galileo. Firms in the aerospace, naval, and land sectors also possess capabilities in electronics. This sector experiences stiff global competition due to the dual nature of these technologies, serving both military and civilian purposes.

The land sector specialises in manufacturing artillery systems, tanks, armoured infantry vehicles, light weapons and various types of ammunition. Collaboration in this sector is smaller, possibly because the technology is quite mature and economies of scale less relevant. Geopolitical changes have reduced the demand for tanks and artillery pieces in favour of other weapons, such as drones. Key players in this sector include KNDS (fusion of Krauss-Maffei Wegmann and Nexter), Rheinmetall Defence, Iveco Defence Vehicles, Patria, BAE Land & Armaments, Diehl and General Dynamics.

The naval sector focuses on producing surfaces vessels and submarines, including aircraft carriers and nuclear propelled ships. The most competitive products in this field originate from France and Germany, primarily due to their smaller size when compared to English and North American vessels. Joint collaborations have been relatively scarce. The ancillary industry encompasses torpedoes, cannons, sonars, radars and combat systems, with these components often accounting for two-thirds of the final product’s value. Leading companies in this sector include BAE, DCNS and ThyssenKrupp Marine Systems. Fincantieri and Navantia are other major players in this sector.

These industrial capabilities are supplemented by national public research organizations such as QinetiQ (formerly DERA in the UK), CEA, FOI, TNO, INTA, and ONERA. These organizations possess testing and verification infrastructure,

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8 Commissariat à l’énergie atomique et aux énergies alternatives (CEA), FOrskningsInstitut (FOI), Toegepast Natuurrwenschappelijk Onderzoek (TNO), Instituto Nacional de Tecnología Aeroespacial (INTA) and Office National d’Etudes et de Recherches Aérospatiales (ONERA).
crucial for assessing the functionality and performance of defence equipment. Some of these organizations carry out similar tasks, suggesting opportunities for streamlining this area.

4.2. European weaknesses

Despite the wide range of European capabilities for supplying the majority of products and services demanded by defence, including research, development, production, technical services and logistic support, there are many areas where bounded capabilities compromise the desired strategic autonomy.

The aerospace sector exhibits weaknesses in combat, bombers and early warning aircrafts as well as satellites, intercontinental ballistic missiles, ballistic air defence, non-piloted aircrafts and engines. The military electronics sector demonstrates a strong dependency on American components as well as cyber-defence equipment. These items are essential for command, control, communications, intelligence, target acquisition and reconnaissance, a key task for achieving information superiority and mission success.

A good indicator of such dependency is the imbalance between defence equipment exports and imports of the United States and Europe. According to the State Department, the US yearly arms exports averages 162,900 million dollars while imports are only 11,500 million dollars,\(^9\) a ratio of 14.17. In contrast, Europe (including UK) exported 32,000 million dollars and imported 32,200 million dollars resulting in a ratio of 0.99. In other words, Europe sells and buys the same quantity of arms.\(^{10}\)

One of the main sources of these weaknesses comes from the different allocation of resources of Member States to defence as previously demonstrated in Figure 1. This gap widens further when considering the amount of effort put into modernizing armed forces. It becomes even more apparent, when comparing the amounts allocated to research and development, with Europe allocating one seventh of US expenditures as shown in Figure 2.

In terms of numbers, it is worth noting that China’s defence budget in 2022 amounted to 229,000 million dollars, a figure close to the European Union’s expenditure in 2021, which was 214,319 million euros. While European defence products still surpass many China’s equipment, as evidenced by its position as the fourth larger exporter, it is highly likely that this superiority will face severe challenges in the coming decades.


\(^{10}\) The sales of US defence equipment to Member States are commented in Bockel (2017).
The national industrial policies of Member States in this field have not helped to overcome these weaknesses. This policy often prioritizes the domestic production of defence equipment, supported by article 346 of the Treaty of Functioning of the EU. Even in cases where there are not domestic providers, offset agreements are signed with the foreign supplier to transfer some technologies and production tasks to local firms. This policy is aimed at preserving the autonomy of Member States, boosting industrial networks in a sector considered technologically advanced, and supporting labour policies of full employment or highly skilled workers.

Whereas this policy serves national interests, it has negative implications from a European perspective, since it reduces [or suppress] competition, promotes duplicity and redundancy of assets, lowers production efficiency and favours an unproper allocation of resources. This is evident from the fact that Europe has more than 154 different weapons systems, in stark contrast with the 27 systems employed by the US Armed Forces, tending these European systems to be more expensive and exhibit lower performance (European Political Strategy Centre, 2015). In the field of army and naval equipment, there is the perception that Europe has too many suppliers.

This policy has favoured many R&D lines with a reduced budget that impede substantial advances in some equipment. Equally, it has obstructed sector restructuring throughout transnational mergers or acquisitions when the number of suppliers was excessive. In sum, Europe faces some kind of prisoner’s dilemma or stag hunt game, where the lack of trust or cooperation leads to suboptimal individual choices from a societal point of view.

The limited willingness to collaborate can be underlined with numbers. Member States invested only 262 million euros in collaborative R&T programmes which meant 7.3 % of total budget for this task and 7,895 million euros in collaborative acquisition programmes, accounting for just 18.3 % of equipment purchases.
according to European Defence Agency defence data (2021). This policy also places at a disadvantage the industry of States with a small defence budget, since they receive fewer aids to develop their products compared to industries of States with larger budgets.

Collaboration typically arises in very large programmes, through multinational agreements like OCCAR, where national capabilities and resources are insufficient to undertake them. Example of such programs include the Eurofighter, the A-400M, the NH-90 Helicopter, the Meteor missile or the Future Combat Air System (NWGS / FCAS).

Under these circumstances, maintaining the strength of the European DTIB poses a real challenge due to the considerable investments and cooperation, which cannot be easily gathered. These uncertain investments, on new research, development or fast innovation exploiting civilian technologies, are essential for remaining competitive in the international market. This is important since Europe will increasingly experience fierce competition from emerging nations like China, India or Brazil.

4.3. The loss of the UK DTIB

The Brexit has also meant an important weakening of the European defence industrial market due to UK’s largest defence technological and industrial base (Barrie et al., 2018). In this context, the collaboration in defence projects will be ad hoc and partners will not automatically enjoy the financial mechanisms and aids currently available for this purpose in the European Union, such as the Defence Fund. Some authors believe, for example, that Europe should only develop a single six generation combat air technologies project instead of two: the NWGS / FCAS participated by France, Germany and Spain and the Tempest project participated by Italy and Great Britain.

5. The cost of strategic autonomy

Certainly, autonomy necessarily means the allocation of higher resources to defence, when current military capabilities are insufficient to cope with the capabilities of potential adversaries. But even enjoying of such superiority, autonomy will require

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11 This organisation, named Organisation Conjointe de Coopération en matière d’Armement (OCCAR), was created in 1996 for supporting European Defence Joint Programmes. The business plan of 2022 set a budget for managing multiyear programmes of 4,733 million euros.

12 Technologies such as microelectronics, advanced computation, robotics and autonomous systems, artificial intelligence, biotechnology and life sciences, material sciences, information and communications systems, sensors and signal processing, energy sources and direct energy are fundamental for the development and efficient production of critical defence systems. They are popularly known as the digital transformation, the fourth industrial revolution or simply as Industry 4.0. A survey of this issue is available at NRC (1999).
sacrifices, as national production will be more expensive than a more open supply-chain based on efficient production without border restraints. In economic terms, the principle of comparative advantage, already discovered by David Ricardo two hundred years ago, applies.\textsuperscript{13} Solutions that limit the trade of military equipment and components will impact on production efficiency of military goods and services and will result in costlier supply. It may imply, within an alliance, the duplication of industrial assets and the loss of scale economies due to small production. Furthermore, the ownership of defence firms has to be preserved from foreign investors whose strategy may compromise the assets necessary for producing critical defence equipment, which impedes the free functioning of the capital market.

In sum, autonomy forbids the rational exploitation of the economic advantages that specialization provides as Adam Smith demonstrated in the eighteenth century. Therefore, a trade-off analysis among strategic autonomy [that assures safety in case of conflict or crisis] and optimal allocation of resources is always needed, even for civilian goods and services.

Joint procurement for complex system provides economies of scales that may reduce the cost of the strategic autonomy. However, this arrangement can be a source of diseconomies caused for example by: a more extensive bureaucracy for managing programmes, decision complexity, harmonization difficulties of purchasing calendars, the forced participation of industrial partners with inadequate capabilities, issues on agreeing the distribution of work and benefits among partners, national variations of the original system or the potential abandonment of the consortium partners. Such diseconomies mean that expected savings and advantages can be smaller than forecasted.\textsuperscript{14}

6. Ensuring Europe’s strategic autonomy beyond defence

Strategic autonomy is not limited to the realm of defence; it also extends to various civilian activities. This is the case of securing essential raw materials\textsuperscript{15} not readily available within the European Union as energy resources like oil, gas and coal that shows dependency on countries like the Russian Federation which has complicated the economic recovery after the pandemics. A problem that extends to other countries like Argelia and Middle East authoritarian regimes. Other raw materials as rare earth elements, lithium, titanium o bauxite supplied by Russia or China are also key for many production processes (Fiott, 2021). To mitigate this vulnerability, Europe needs a diversified supply base, secure supply routes, resource substitution with other materials or sources (e.g., transitioning to solar, wind or hydropower for energy needs), the establishment of strategic reserves or the effective recycling of these materials.

\textsuperscript{13} This principle has been reformulated and updated by the Heckscher-Ohlin-Samuelson theory of international trade.

\textsuperscript{14} On the difficulties for managing innovative projects (Mowery & Rosenberg, 1989).

\textsuperscript{15} On the problem of raw materials in defence (Pavel & Tzimas, 2016; Blagoeva et al., 2019).
Additionally, concerns arise regarding Europe’s loss of technological and industrial assets leading to growing dependency on third countries. The COVID-19 pandemic highlighted this vulnerability when Europe faced shortages of critical supplies like face masks, breathing equipment or vaccines. The growing size of the supply chain for many products crosses national borders increasing dependencies on third countries. This is because the production of some supply chain items is more cost-effective when suppliers are chosen worldwide and the industry of some nations provides components with equal or better quality and lower price (sometimes stimulated by tax exemptions, subsidies or less stringent environmental regulations that are far from a level playing field) as is the case of semiconductors that has affected the European automation industry (Fiott & Vassilis, 2020).

Furthermore, emerging fields as digitalization, electronic commerce or cybersecurity also present challenges to Europe’s autonomy. Cloud computing, for instance, may rely on servers located outside the European Union, often operated by major companies like Amazon, Microsoft, IBM, Google or Alibaba. The cyberspace domain is susceptible to attacks from criminal organisations or nation States, as seen in the “WannaCry” virus incident, which disrupted the rail operator Deutsche Bahn and the UK’s National Health System. In light of these concerns, calls for European technological or digital sovereignty have lately grown.

In summary, industrial policies are also required to safeguard the Europe’s strategic autonomy, not only in defence but also concerning non-military but critical goods and services. These policies may involve imposing taxes and restrictions on commerce with nations that unfairly benefit from government support, limit European trade or employ inadequate practices that harm global commons, such as the sea or the atmosphere, leading to global warming as well as other adverse effects.

For coping with these problems, Europe has initiated several measures as the European Initiative on Raw Materials, the Action Plan on Critical Raw Materials, and the development of a European Alliance on Raw Materials, initially focusing on batteries. In industrial production, studies have identified critical technologies that Europe must maintain. The European Industrial Strategy of 2020 also emphasizes the importance of preserving European industrial sovereignty, identifying critical areas and enabling technologies, such as nanotechnologies. Regulation 2019/452 aims to control foreign investments that may jeopardize European security, considering that foreign direct investments in 2021 amounted to 14,051,438 million euros according to Eurostat.

In terms of technological and digital sovereignty, the EU has made investments in the European High-Performance Computing Joint Undertaking in 2018 and the Digital Europe Programme in 2021 with a budget around 7,500 million euros for the period 2021–2027. This programme covers supercomputing, artificial intelligence, data, cloud usage, cybersecurity, digital advanced skills and accelerating the adoption

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16 Information stored in the cloud can be physically located outside the EU. These assets can be compromised during a crisis and can be exploited by foreign States, jeopardizing European sovereignty.
of these technologies in the economy and society. The European Chips Act allocates 15,000 million euros to reduce dependency on semi-conductors, primarily produced in East Asia, particularly in Taiwan. Another key investment is the Infrastructure for Resilience, Interconnectivity and Security by Satellite with a budget of 1,650 million euros for the period 2023-2027.

Given the changing criticality of various products and supply chain components, continuous monitoring is essential to adapt and prevent bottlenecks that may compromise Europe’s desired autonomy.

The most recent initiative of the European Commission, the Strategic Technologies for Europe Platform (European Commission, 2023), aims to support Europe’s leadership in technologies considered critical for its sovereignty and autonomy. This initiative seeks to mobilize available funding within the scope of existing instruments, increasing the total amount to over 10,000 million euros and may be operational in 2024 pending approval by the European Parliament.

7. Conclusions

The evolution of the world reveals the diminishing influence of the European Union in the global economy landscape as can be seen in the EU’s share of the world GDP that has declined from 47 % in 1913 to 11 % in 2030, according to the Maddison 2020 project Database (Bolt & van Zanden, 2020). Furthermore, key European capabilities and assets have also lost prominence in comparison to those of foreign nations, particularly China. China’s ascension to the position as the second economic power in the world grants it significant leeway, and it now leads in critical sectors like quantum computing, artificial intelligence or the outer space endeavours.

Some key statistics clearly underscore this shift. For example, according to the UNCTAD (2018), in 2018, China accounted for the 26 % of the world’s graduates in science, technologies, engineering and mathematics (STEM), while Europe represented only 9.5 % and the US had the 6 %. In 2008, the United Kingdom, France, Germany and Italy invested in defence 2.6 times more than China. However, in 2018, this amount was reduced to 0.78 (Stockholm International Peace Research Institute, 2018). According to the OECD database, China spent 464,705 million dollars to Research and Development (R&D) activities in 2019, a value close to Europe 472,432 and the US 631,845. This is a main concern given that many civilian technologies drive advancements in the defence sector.

In an era where Europe’s ability to assert its interests and values on the global stage is waning, the concept of strategic autonomy, allowing Europe to confidently shape its future, is appealing to its citizens. Uniting around this idea may foster greater political will to consolidate Europe and to achieve greater autonomy.17

17 Only in this way, will Europe preserve its main success: a world region ruled by individual freedom, human rights, democracy, free market and the law. This is closely linked to considerable wealth as well as social measures that support the inclusion of less favoured sectors, thus providing large welfare to all their citizens.
However, increased coordination and integration of Member States’ policies is necessary for advancement, a task that faces reluctance of Member States, still remaining substantial room for improvement. The slow progress in other issues, like banking integration, patents, electrical network interconnection or fiscal integration suggests a protracted progress on this theme.

This article has shown the challenging path to achieving reasonable autonomy, recognizing the economic unfeasibility of complete autonomy and the potential scarcity of expected benefits (see below). Under such circumstances, Member States, having a powerful and reliable ally to face threats, as the United States since the end of World War II, have preferred to direct resources toward more pressing social needs. Certainly, the choice among dependence and autonomy is mainly political based on preferences like trust, confidence or self-reliance which may differ among Member States and change over time. However, such autonomy could be only achievable through a European collective decision, which explains the difficult path to advance in this area. Nevertheless, the instruments already developed, such as the European Defence Fund, represent an important step toward enhancing such “strategic autonomy” through increase coordination and financial support. Furthermore, the Ukrainian invasion has been a catalyst to co-ordinate progress and invest in defence means and capabilities.

This new context means also a significant opportunity for the European defence industry. However, this chance is also a challenge to industry because, due to a strong competition among the different consortia that present proposals for funding, since not all the firms will be granted with aids. Furthermore, it presents a challenge for Ministries of Defence as they must arrange joint programmes with other Member States to contribute significantly to the CSDP.

Certainly, a more assertive Europe, able to contribute to NATO with significant defence capabilities, will enhance its credibility as a faithful partner (the President of the European Council, the President of the European Commission and the Secretary General of the North Atlantic Treaty Organization, 2023) and enforce the Alliance. Its implementation requires negotiations regarding the identification of the capabilities that Europe and the US shall own and share when they jointly face a crisis or a conflict. This task is certainly complex, requiring constant review to adapt to changing circumstances. The avoidance of unneeded redundancies or the oversupply of capabilities that will imply a significant waste of resources for defence with higher utility in other social needs may be a source of disagreement. Ultimately, such autonomy is questioned in the US when it is interpreted as an argument for raising barriers to its industry in Europe.

Moreover, in our interconnected world, where risk is ubiquitous, there is an increasing array of alternatives to armed conflict as well as for tackling critical challenges, such as terrorism, cybersecurity, illegal immigration, climate change or

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18 See, for example, the Commission withhold of funds from Poland and Hungary as punishment for violations of the EU rule of law.
19 The growing focus of the US foreign policy in the Asia-Pacific region suggests also the need that Europe becomes more responsible of its defence.
pandemics. These challenges do not necessarily require military capabilities (i.e., hard power), but rather novel methods and collaborative frameworks, akin to the soft power concept advocated by Nye (1990). These collaborative ecosystems, rooted on trade and cooperation, create interdependencies that, despite their brittleness, will yield greater rewards. Proper reinforcement of these ecosystems is required to ensure their feasibility and reliability. Although they reduce autonomy, they are key for better managing and sharing the finite resources required for achieving global peace, security and prosperity.

In sum, the pursuit of strategic autonomy shall not entail a return to autarchy or the rejection of alliances, but rather a quest for the most effective means to manage interdependencies in terms of interests, economic values, security and fair norms.

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