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INFOFLASH

THE ECONOMIES OF SCALE OF JOINT DEFENCE PROCUREMENT

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Introduction

Experts have long recognised economies of scale as a powerful mechanism to drive efficiency, reduce costs, and enhance production capabilities. This imperative has only been made more acute with the geopolitical urgency driven by the war in Ukraine and shifting global security dynamics, signalling the need for reform in the European defence sector. However, the promise of economies of scale remains largely unrealised due to deep-seated fragmentation and the prioritisation of national sovereignty over cooperation. With twenty-seven separate defence markets, each maintaining bespoke production runs, Europe faces duplicated research efforts, inflated costs, and inefficiencies in procurement and production. Despite initiatives such as the European Defence Industrial Strategy (EDIS), Member States' prioritisation of sovereignty over collaboration undermines efforts to pool resources, consolidate demand, and streamline production timelines, limiting the continent's ability to respond effectively to geopolitical challenges. Addressing these structural barriers is essential to realise the economic and operational benefits of economies of scale, enhancing Europe's strategic autonomy and industrial capacity. This paper examines how economies of scale be effectively leveraged in the European defence sector to reduce costs, enhance production capacity, and strengthen strategic autonomy. It does so by analysing the historical and structural factors behind the fragmentation of the European defence industry and the resulting inefficiencies in defence spending. Following a discussion of a framework for a pan-European defence industry, it then delves into the concept of economies of scale. The study concludes with policy recommendations to address fragmentation and strengthen the European defence sector.

1. The Fragmentation of Europe's Defence Sector

Roots of Industrial Fragmentation

Recent geopolitical tensions have exposed the ineffectiveness of the European defence sector and its industrial base, which is largely attributable to national fragmentation within the European industrial base. European leaders recognised this issue early on and sought to establish a more effective and unified defence sector as early as 1996 when they proposed a single European market for defence goods and services. At the same time, the European Commission advocated for pan-European consolidation of the continent's defence industry. However, the collapse of the Soviet Union and the signing of the Maastricht Treaty in 1992 shifted the European community's focus away from defence and towards monetary integration (Mueller, 2024; European Council, 2018). Following the Cold War, Europe embraced the peace dividend under misguided assumptions, which caused sustained underfunding in defence. This neglect has resulted in three major challenges: severely

depleted stockpiles, inadequate and insufficient military capabilities, and a drastically reduced industrial production capacity (Angelet, 2022). In numerous cases, stock levels dropped far below NATO standards, making it difficult for many European military units to meet NATO and EU readiness requirements. Over the past twenty years, strategic enablers have deteriorated further, with several countries dismantling their heavy weapon reserves (Angelet, 2022). The EU contains twenty-seven different armed forces, ministries for defence, and markets each causing costly duplications of military capabilities, weakening Europe's defence technological and industrial base (EDTIB) and challenging the interoperability between national forces (Koenig et al., 2024).

Contemporary Challenges of Fragmentation

In the recent report by the European Commission (2023) on EU Competitiveness, it is stated that the fragmented European Defence Sector limits its scale and hinders operational effectiveness in the field. The report outlined two key issues: firstly, the European defence sector lacks the scale required in a capital-intensive industry with long investment cycles. Secondly, the report points to a lack of standardisation and equipment interoperability because of industrial fragmentation, which has become evident during Russia's invasion of Ukraine (European Commission, 2023).

The Munich Security Conference's 2017 European Defence Report revealed that in 2016, European member states operated one hundred and seventy-eight different major weapon systems, compared to just thirty in the US military (Kump & Pauly, 2023). EU member states utilised a much broader range of main battle tanks (seventeen versus one), destroyers and frigates (twenty-nine versus four), and fighter aircraft (twenty versus six) than the US (Kump & Pauly, 2023). The US serves as a valuable comparison due to its ability to leverage economies of scale in defence production (Olsen, 2023). Through centralised procurement and programs like Foreign Military Sales (FMS), the US lowers per-unit costs while enhancing operational efficiency and interoperability (DLA, 2024). This approach contrasts sharply with the EU's fragmented defence sector, where duplication and customisation drive up costs and reduce effectiveness.

EU Member States have sent ten different types of 155mm howitzers to Ukraine, each of which requires unique supply chains to remain in service—understandably causing logistical barriers for Ukraine's armed forces (UAF) (European Commission, 2023). This fragmentation persists today, driven by diverse national requirements and standards, which often result in multiple variants of the same equipment. For example, the NH90 helicopter exists in over twenty configurations (Kump & Pauly, 2023). Such customisation complicates collaborative development and procurement among EU member states, increasing costs and reducing

efficiency.

The European Defence Agency (EDA) has highlighted the logistical challenges posed by the diversity of artillery systems supplied to Ukraine (EDA, 2022). Specifically, the EU has provided Ukraine with various self-propelled howitzers, including France's Caesar, Poland's Krab, Germany's Panzerhaubitze 2000, and Slovakia's Zuzana. Each of these systems requires distinct supply chains for maintenance and ammunition, complicating logistics for Ukraine's armed forces. Regarding the number of main battle tanks (MBTs) among Member States, they have drastically declined, dropping from 15,000 in 2000 to just 5,000 (EDA, 2017). Historically, many EU countries have relied on Soviet-era equipment. However, considering the war, reliance on Soviet legacy technology is unequivocally unacceptable. As a result, MBT procurement must urgently shift toward suppliers that can ensure long-term security, reliability, and independence from adversarial influence.

2. Renewed Discussions on Defence Spending Efficiency

As most European nations face new security challenges, defence budgets and capability investments are further strained by tenuous post-pandemic economic conditions, including rising inflation, which drives up the costs of equipment, logistics, and personnel. Russia's invasion of Ukraine has starkly highlighted the weaknesses of Europe's fragmented defence systems, exposing inefficiencies and underscoring the need for stronger collective capabilities. Morten Brandtzæg, CEO of Norwegian defence company Nammo, aptly described the conflict as 'a war about industrial capacity,' emphasising the urgency of addressing these shortcomings (Aries, 2023). In response, many EU Member States are seeking ways to optimise defence spending to sustainably enhance their capabilities (Dorn et al., 2024). These pressures have reignited discussions on European defence integration, including proposals for a joint European defence market, unified procurement policies, and the consolidation of the defence industry. Recent initiatives from the European Commission aim to incentivise Member States to address depleted reserves while providing Ukraine with critical equipment. Key strategies include encouraging joint procurement to ease capability shortfalls, aggregating demand for supplies such as ammunition, and scaling up European production capacities. These efforts also focus on enhancing interoperability among EU armed forces, ensuring adequate stockpiles, and improving logistical and operational readiness (Crosson & Marrone, 2024).

Several initiatives have produced mixed results, little in the way of achieving stated policy goals to enhance European industrial capacity. For instance, the European Defence Industry Reinforcement through Common Procurement Act (EDIRPA) has had minimal tangible effects in a procurement landscape valued in the tens of billions. The act took a remarkable

1.5 years to materialise, reflecting significant delays (Crosson & Marrone, 2024). Collaborative procurement among EU Member States remains limited, as nations often prioritise immediate market availability in a zero-sum approach, frequently relying on non-EU suppliers (Crosson & Marrone, 2024). This led to the creation of the EDIS in March of 2024. The initiative's goal is to achieve the value of the intra-EU defence trade, representing at least thirty-five per cent of the value of the EU defence market by 2030 (European Union, 2024). In addition, at least half of the Member States' defence procurement budget should be devoted to procurement from the EDTIB. Eventually, in five years the goal of the Member States is to procure defence equipment in a more collaborative manner (European Union, 2024).

3. A Pan-European Defence Industry

What exactly does 'a more collaborative manner' entail? When a truck-mounted self-propelled gun takes eighteen months to assemble, an armoured fighting vehicle two years, and a Leopard 2 battle tank more than three years, the challenges facing Europe's defence industry come into sharp focus (Gressel, 2024). This demonstrates the inefficiencies caused by fragmented production processes and a lack of coordination across the EU. A more collaborative approach would mean streamlining procurement strategies, harmonising standards, and pooling resources to reduce delays, eliminate redundancies, and improve the overall efficiency of production and supply chains. For Member States, the stakes are high: the ability to equip their militaries in a timely and cost-effective manner is increasingly at odds with the realities of production. The issue isn't just about slow manufacturing; it is about a fragmented procurement system that prevents Europe from leveraging one of the most powerful economic tools available—economies of scale. Today, orders for military equipment are made on a country-by-country basis, with little coordination across borders. This piecemeal approach leaves manufacturers unable to standardise processes or ramp up production efficiently, driving up costs and stretching timelines. European militaries need to think big to break this cycle—literally. Placing large, coordinated orders across Member States is the only way to bring costs down and shorten production timelines and with the demand for modern weaponry increasing, adopting this approach isn't just a matter of economic prudence; it's a necessity. However, achieving this level of collaboration requires a drastic shift in how Member States approach defence policy.

Theoretical Foundations for Economies of Scale in Defence

The theoretical underpinnings of economies of scale in defence reinforce the argument for greater cooperation and integration within the European defence sector. Studies show that as the defended population grows, total defence costs increase at a less-than-proportional

rate, reducing per capita defence expenditures (Adán & Royo, 2014). However, achieving these cost savings depends on factors such as production technology, organisational structure, and the degree of standardisation in defence systems. For example, decentralised procurement in Europe has resulted in inefficiencies, with NATO's European members operating eleven frigate models and sixteen armoured vehicle models compared to just one and three, respectively, in the US (Bekkers et al., 2009). This diversity increases costs due to duplicated R&D efforts, individualised maintenance, and less efficient supply chains. Moreover, operational costs can be reduced through bulk procurement and standardised maintenance programs, enhancing efficiency and allowing Europe to better respond to modern security challenges (Tardy & Ostanina, 2024). The theoretical insights suggest that fostering supranational defence cooperation and pooling resources could yield significant cost savings, improve interoperability, and enhance Europe's strategic autonomy. Nonetheless, achieving these benefits requires addressing internal mistrust and divergent national priorities, which currently hinder the realisation of scale economies.

The Case for a Unified European Defence Production Strategy

The war in Ukraine provides a stark example of why Europe must rethink its defence procurement strategy. To adequately supply Ukraine, European manufacturers must produce hundreds of critical systems. The defence industry faces the challenge of rapidly increasing production to meet the heightened demand. The challenge is clear: without a unified approach to vehicle production, Europe risks falling short of providing the quantities Ukraine desperately needs (Gressel, 2024). A coordinated plan to produce and supply hundreds of tanks, infantry fighting vehicles, and other critical systems could address both Ukraine's immediate battlefield requirements and the longer-term need to replenish Europe's reserves. By pooling resources and aligning procurement, Member States could support Ukraine more effectively and build a more resilient and responsive defence industrial base. Otherwise, without a pan-European plan, Europe will not generate the quantities required to sustain Ukraine.

Moreover, the high unit cost of German-made Leopard tanks, such as the Leopard 2A8, hovering at around €30 million per unit, highlights the inefficiency of low production volumes (Mejino-López & Wolff, 2024). In contrast, the American Abrams tank costs \$10 million including training and sustainment (Bose et al., 2023). This points to the fact that the limited production scale of European systems drives up prices significantly. This issue extends beyond tanks to other equipment like self-propelled howitzers, where similar patterns of high costs and low output persist (Mejino-López & Wolff, 2024). According to the European Commission, the absence of collaboration among EU Member States in defence and security results in an estimated annual cost of €25 billion to €100 billion (Údajů, 2017). Around eighty

per cent of defence procurement and over ninety per cent of research and technology initiatives are managed at the national level. However, it is estimated that pooling procurement efforts could reduce annual defence expenditures by as much as thirty per cent (Údajů, 2017). This fragmented approach, with individual nations maintaining small, bespoke production runs to meet domestic needs, prevents the consolidation necessary to achieve cost-efficient production.

4. Constraints on Major Defence Contractors and SMEs

Member States prioritising domestic production to meet their own specific defence needs also constrains the continent's largest defence contractors (Mejino-López & Wolff, 2024). While the market values of many European defence companies have surged, driven by heightened security demands since the Russian invasion of Ukraine, these industry leaders remain confined to operating within relatively small national markets. This lack of scale limits their ability to justify the significant investments needed to expand production capacity, even as demand grows. Export restrictions and decades of underinvestment in defence during the 'peace dividend' era further exacerbate these challenges, leaving the industry struggling to fully capitalise on the current surge in demand (Mejino-López & Wolff, 2024).

Small and medium-sized enterprises (SMEs) face significant challenges of their own. Many struggle to secure private financing, while projects supported by the European Defence Fund (EDF) frequently falter at the prototype phase, unable to reach full production (Luisari, 2024). To address these structural weaknesses, the European Commission launched the EDIS. The initiative aims to strengthen industrial capacity and edge the EU closer to its ambition of 'strategic autonomy,' although the politically sensitive term is deliberately omitted from the EDIS itself (2024). The EDIS rightly points to unpredictability in demand as a core problem. Without unified, large-scale orders, economies of scale remain out of reach, leaving manufacturers reliant on exports to survive (Luisari, 2024).

In other words, unable to supply the necessary consumables and materials quickly enough, Member States have been forced to turn elsewhere. According to EDIS, a staggering seventy-eight per cent of the €240 billion spent on defence acquisitions between February 2022 and June 2023 went to non-EU suppliers (European Union, 2024). Worse still, sixty-three per cent of those purchases were off-the-shelf items drawn from existing industrial stockpiles (European Commission, 2024b). This means billions of euros, funds that could have been invested in expanding the European defence industry's capacity, were spent outside the EU instead. The failure to deliver in the required time and volume has not only cost the European defence sector financially but also damaged its credibility. Precious resources have flowed out of Europe, leaving its industrial base underfunded and underprepared to

meet the continent's security challenges.

EUDIS to the rescue?

As mentioned, in a market where national governments are the only buyers, the demand side does not express itself collectively, resulting in duplication and, hence, does not reach optimal results. In addition, the supply side is not created to cooperate or match a more efficient expression of demand. By doing so, it lacks predictability of orders, hence failing to achieve economies of scale. Amid growing desperation, Member States tend to acquire off-the-shelf products from foreign manufacturers, which not only diminishes domestic demand but also redirects EU taxpayers' money abroad. To improve innovation, the EU must boost start-ups, SMEs, small Mid-Caps, and RTOs by offering rapid funding and fostering connections between military end-users and investors (European Commission, 2024a). For this purpose, the EU Defence Innovation Scheme (EUDIS) was launched under the EDF with €2 billion in budget. The aim is to reduce bureaucratic barriers, particularly for SMEs, by considering measures such as continuous project calls and promoting the transfer of promising civilian technologies to the defence sector when relevant (European Commission, 2024a). The European Commission and the European Defence Agency (EDA) (Hub for EU Defence Innovation - HEDI) collaborate closely to provide tailored support to defence innovators, offering guidance on military needs and connecting them with European defence communities (European Commission, 2024a). Annually, EUDIS, in partnership with HEDI, supports up to 400 start-ups and SMEs, helping them overcome entry barriers (European Commission, 2024a).

Policy Recommendations

The European Commission has already made recommendations for the EU defence industry (European Commission 2024b). In the short term, it is vital to increase the aggregation of demand between groups of Member States, as well as ramp up the share of joint procurement. Secondly, in the medium term, the Commission set a vision of the EU defence industrial policy that aims to supervise the cross-border integration of defence assets and consolidation of EU industrial capacity to increase scale, standardisation and interoperability (European Commission, 2024b). The 'Future of European Competitiveness' report states that the EU competition policy, which prevents monopolistic practices, should, in this case, allow companies in the defence sector to merge or collaborate if the actions lead to great efficiencies, such as reducing redundancies, achieving cost savings, or optimising the production process (European Commission, 2024b).

Usually, competition policies focus on preventing dominant players from stifling smaller

competitors. However, in this case, the policy is urged to prioritise strategic objectives. By consolidating resources and expertise, European defence companies could achieve the extent needed to compete more effectively globally. As an example, the US consolidated its defence industry after the Cold War under the belief that it would not have been able to survive with its fragmented defence base. From the 1990s onwards, the American defence industry went from fifty-one to five principal suppliers (Miedziński, 2024). This restructuring guaranteed good quality and scale needed for the defence powers of the US. Nonetheless, it raises some questions regarding dependency issues on the very few industry leaders. Consolidation should be allowed when it helps attract or sustain significant investments in the defence sector that foster technological innovation and promote the development of cutting-edge capabilities.

In addition, as previously addressed, the European Commission also warns against the resources flowing overseas. Hence, another recommendation is to reinforce a European preference principle in procurement. This way, the minimum share of this increasing demand is concentrated on European companies rather than foreign investments (European Commission, 2023). Another recommendation involves funding for R&D. This usually takes place at the Member State level. Yet, as weapons and countermeasures become more technologically sophisticated, pan-European coordination is needed, as no individual state has the means to finance the development and production of all capabilities and infrastructure required (European Commission, 2023). For this purpose, the Commission proposes the 'European Defence Projects of Common Interest' to foster industrial cooperation.

Recent Implementation

In last year's report, 'A New European Defence Industrial Strategy: Achieving EU Readiness through a Responsive and Resilient European Defence Industry,' the European Commission reiterates the need to leverage readiness through investment (European Commission, 2024a). The EU aims to enhance defence investments by improving coordination among Member States, targeting key areas, and avoiding duplication.

- A newly established Defence Industrial Readiness Board will streamline joint programming and procurement, aligning Member States' plans with industrial capacities while advancing key projects through existing initiatives to integrate air and missile defence, cyber networks, and maritime protection assets (European Commission, 2024a).
- The EU also seeks to strengthen defence readiness by promoting collaborative investment across the entire capability lifecycle, leveraging tools like the Capability

Development Plan (CDP) and CARD (European Commission, 2024a).

- Additionally, the new Structure for European Armament Programme (SEAP) will standardise cooperative armament projects, simplify procedures, and provide financial bonuses to Member States to encourage long-term defence collaboration (Scazzieri, 2024).
- A European Military Sales Mechanism, similar to the US Foreign Military Sales (FMS) program, has been proposed to counter the growing reliance on non-EU suppliers (Tardy & Ostanina, 2024). It aims to enhance the availability and visibility of EU-made defence products by providing a centralised catalogue, readiness pools, streamlined procurement processes, and administrative support (European Commission, 2024a).

Conclusion

The fragmentation of Europe's defence sector, marked by inefficiencies, duplicated efforts, and inflated costs, challenges the continent's ability to respond effectively to emerging geopolitical threats. The lack of economies of scale in defence production has limited Europe's industrial capacity and strategic autonomy, leaving it reliant on non-EU suppliers and unable to fully capitalise on the growing demand for modern military capabilities. Addressing this structural inefficiency is not just an economic imperative but a strategic necessity. Scaling the European defence sector offers a pathway to enhanced efficiency, cost-effectiveness, and operational readiness. By aggregating demand, consolidating industrial capacity, and fostering cross-border collaboration, Europe can unlock the potential of economies of scale. Standardisation and joint procurement will not only lower production costs but also enable the rapid deployment of advanced defence technologies, strengthening Europe's position as a global defence leader.

The recommendations outlined by the Commission promise a transformative shift. If executed effectively, these measures could resolve long-standing inefficiencies, strengthen Europe's defence industrial base, and secure its strategic autonomy. Ultimately, the success of these efforts will depend not only on strategic policies and investments but also on Europe's willingness to transcend national boundaries and embrace a shared vision of collective security and industrial strength.

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