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Readiness Through International Cooperation: Finnish Defence Industrial Strategy in Changing Operational Environment from the Mid-1990s to the Early 2020s

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ABSTRACT
After the Cold War, European defence industrial capacity decreased; however, in the 2020s, there is again a need for products of the defence industry. Although Finland is a small country, it has significant production capacity for defence materials. In this paper, we analyse how Finland preserved it in changing operational environment. We utilize points of departure of source-based historical research to give any reader an idea over the history of the theme. To conduct this, we have used publicly available documents and other texts, which are findable from Finnish repositories, and analyse what was Finnish policy and why it was formulated in relation to wider security political contexts. Additionally, we will analyse the available statistical data related to exports of the Finnish defence industry as they are a key part of Finnish policy. Using statistical and econometrical tools enables us to reveal important tren5ds that could otherwise be left unnoticed. Our statistical sources include, for instance, Finnish Government publications, arms industry databases of AFDA and SIPRI, SaferGlobe data, and LSEG Data & Analytics platform. Our data sources contain the most reliable and informative data available publicly.

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Preface

A key question related to the defence industry is whether governments should own factories or buy products from companies. Naturally, there are pros and cons to both options (see Lakomaa 2017, 227). In recent decades, the role of companies has grown, making defence industry more international, influencing countries' acquisition strategies of the defence materials they needed or anticipated to needing. The effects of this development were evaluated in Finland in 2021 as follows by Tarja Jaakkola, Sanna Laaksonen, Sami Liukkonen and Krista Salo:

> The changing security environment, the defence industry's increasingly global production chains, dependence on third countries for defence-critical raw materials, technological development, and the growing role of the European Union in defence material and industrial issues further emphasize the importance of international material cooperation. Securing the capabilities required for a credible defence capability requires even more active international cooperation and wider international networking. (Jaakkola et al. 2021, 186-187)

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This describes then-militarily-nonaligned Finland's defence industrial thinking in the early 2020s, before Russia launched a full-scale war against Ukraine on 24 February 2022, which subsequently led to heightened discussions related to defence industry across Europe. In this context, studying Finland's defence industry is beneficial despite its small size due to recent developments. After Russia's war, Finland, recognized for its military capabilities, quickly joined NATO. There is also an industrial dimension connected to the theme. Finland maintained considerable production capacity post-Cold War, unlike much of Europe (see e.g. Komulainen 2007; Meijer 2010; Isojärvi 2015; Aries, Giegerich, and Lawrenson 2023; see also Lundmark 2003), and after the Russia launched the war, there were significant investments from NAMMO, for instance.

Questions arise about why and how Finland preserved its defence industrial capabilities post-Cold War. While this topic lacks major historical research in contexts of Finland, answering these questions offers broader benefits. History shows conflicts end, but new ones arise, highlighting the need for readiness and useful historical insights. Thus, understanding why Finland, preserved its defence industrial capabilities post-Cold War helps form future policies, applicable to any country.

This article argues that Finland preserved its defence industrial capabilities for readiness and international cooperation was a way to do so. Examining the policy and its reasons is conducted through source-based historical research. While it is possible to give interpretation on the theme, there is inherent limitation. Since the topic concerns Finnish security policy over the past 25 years, materials detailing actual planning (what Finland would do in any specific situation, why, how etc.) are classified.

Nevertheless, publicly available documents and other texts, accessible from Finnish Government's publications archive, Finnish National Law Repository, and National Library Repository by searching government reports or key words Huoltovarmuus (security of supply), Sotatalous (war economy), puolustustarviketeolisuus (defence industry), reveal Finnish policy and its formulation in relation to broader security-political contexts. These primary sources include governmental reports on security policy, defence policy, and security of supply policy; laws affecting the studied theme; and public writings of those who participated in actual policy making, representing contemporary discussions/information sharing on the topic.

These texts can be found from journals and yearbooks, particularly from *Sotataloustietoutta*, specialising in defence industry and war economy in Finland. Of course, we could also use parliament documents and press materials. However, they would not offer much since government reports represent governmental policy and if they are not approved by parliament, it is easy to detect. Since no Finnish government has fallen due to security policy matters, it is safe to say that parliament discussions do not offer anything essential to this article (see also Roiko-Jokela 2022, 2023b, 2023a, 2024, in which these discussions are used as a source material). Therefore, in an article with limited length, it is practical to stay in official governmental policy and professionals' public writings.

Additionally, we will analyse the available statistical data related to exports of the Finnish defence industry as it is a key component of the national strategy as shown later in this paper. Employing statistical and econometric tools allows us to uncover important trends that might otherwise remain unnoticed. Our statistical sources include publications from Finnish Government and Association of Finnish Defence and Aerospace Industries, the SIPRI arms industry database, SaferGlobe data, and the LSEG Data & Analytics platform. Our data sources comprise the most reliable and informative data available publicly. In statistical analysis, turnovers of the defence industry companies are not analysed. This is since the Finnish defence industry gain only a part of its revenue from defence related business; civilian business is impossible to separate from military business. Therefore, the analysis of turnovers would not give a clear idea over the theme.

National Reasoning for Preserving National Defence Capabilities After the Cold War and a Need to Internationalize Defence Industry

During the Cold War, the Finnish defence industry operated strictly from a national perspective due to foreign political reasons, the Paris Peace Treaty (1947), and the Agreement of Friendship, Cooperation, and Mutual Assistance (1948) (on these themes in context of Finnish defence industry see, Roiko-Jokela 2022, main Chapter 2; Roiko-Jokela 2023b, main Chapter 2; Roiko-Jokela 2023a, main Chapter 2; Roiko-Jokela 2024, main Chapter 2). The late 1980s and early 1990s saw changes with the Soviet Union's dissolution and Finland joining the European Community/Union. At the same time, the end of the Cold War led to general decreases in defence budgets across Europe, with states focusing more on crisis management with smaller defence forces.

However, amid these changes, Finland's security solutions did not change significantly. Finland retained conscription after the Cold War, reflecting national defence priorities. The national reasoning behind this decision provides insight into why Finland's defence solutions and defence material policy evolved as they did.

In the late 1990s, the Finnish government evaluated that after the Cold War, security relied on cooperation and economic integration, with the European Union, Russia, and NATO seen as the most important factors affecting the European security environment. Despite this, Finland continued its military nonalignment policy, maintaining its tradition of neutrality while politically committing to the European Union. This was because evaluations indicated no threats necessitating joining a military alliance. Instead, military nonalignment was viewed as supporting stability in Northern Europe (1997).

A crucial aspect of Finnish policy was the recognition that the absence of threats did not preclude potential future risks, which was emphasised in Finnish policy formulation. The main question, according to the Finnish government, was The question of Russia's orientation and status as a great power after the dissolution of the Warsaw Pact and the Soviet Union governs the security political development in Europe. [. . .] Russia's ability and willingness to commit to cooperation are decisive factors for European security (1997).

The importance of Ukraine was also emphasized. Finnish officials evaluated that Ukraine was crucial for the stable development of Eastern Europe, but its future depended on its democratic and economic development and international support. This was essential due to the tense relations between Russia and Ukraine over the status of the Crimean Peninsula and the naval base in Sevastopol. The report stressed the need to resolve these issues, noting: 'Ukraine's international status significantly affects the stability of Central and Eastern Europe' (1997; on Finnish NATO discussion see e.g. Särkkä 2019; Roitto and Holmila 2021).

From these considerations, it is evident that the fundamental aspects of Finnish national defence organization remained unchanged, and there were potential risk factors in the European security environment. Therefore, the Finnish standpoint was that defence capabilities were still necessary, but the approach became more international than during the Cold War due to intentional policy (see 1997). This was particularly true for the defence industry as the government report outlined ways to secure the operational conditions of the national defence industry, aiming to maintain sufficient purchases from the domestic industry and promote international division of labour in the defence sector (1997).

Finnish policy regarding defence materials was twofold. On the one hand, the importance of the national defence material industry was emphasized. Already in 1995, the Finnish government had decided:

> In terms of military defence readiness, the basic industry is maintained and developed. The operating conditions of the domestic defence equipment industry are secured, and the sector's participation in the international division of labour is promoted. Critical materials are stored in emergency warehouses to enable the implementation of the approved procurement goals for the most important materials in a crisis. The production capacity for the Defence Forces' most important consumable materials is maintained during normal times, considering

> the needs of the defence sector. The most crucial industry is ammunition supply. For consumables, a repair capacity corresponding to the estimated need required by the defence situation is maintained, and sufficient spare parts stocks are kept. Industrial capacity and research and development activities are sustained in high-tech products. (Valtioneuvoston päätös huoltovarmuuden tavoitteista 1440/1995)

The Finnish governmental report, published in 1997, continued in a similar tone. The role of the defence industry would be to create and maintain operational conditions for national defence; the Finnish Defence Forces would assist in maintaining the national defence industry by procuring materials according to the resources allocated to it. On the other hand, international defence material cooperation was also emphasised, with the statement that 'During possible crises, international cooperation and material compatibility [with international partners] improve Finland's chances to procure defence materials from abroad' (1997).

An essential reason for emphasising international cooperation lay in technological developments in defence. The idea was that in the future, Finland would have to purchase a significant number of high-technology systems from abroad (1997). However, despite the increasing importance of international dimensions, there was still a strong national emphasis. Due to the need for international cooperation, the offset agreement policy was highlighted. The Finnish government stated that if defence materials were purchased abroad, it would be necessary to prepare and/or assemble them at least partially in Finland to support national security of supplies and increase national know-how (1997; Anteroinen and Lehtonen 2017), 7-8).

While Finnish policy was starting to turn towards international cooperation and recognizing the possible need for foreign defence material purchases, the Finnish defence industry was also undergoing national alterations. A text written by Mäkinen (1997, 32), Chief Director in the Finnish Ministry of Trade and Industry, sheds light on Finnish policy in this regard. By 1997, the Finnish defence industry was consolidated under a single company, Suomen Puolustusväline Oyj (later Patria Industries Oyj), owned by the Finnish state. According to Mäkinen, the purpose of this change was to maximise the technological capabilities of enterprises, improve profitability, marketing, research, and development activities, and eliminate overlapping operations. The creation of the new company would significantly strengthen the Finnish defence industry (see also Roiko-Jokela 2022, 167-182; Roiko-Jokela 2023b, 167-182; Roiko-Jokela 2023a, 259-263; Roiko-Jokela 2024, 259-263).

This illustrates Finland's actions at the national level and how swiftly defence industrial questions evolved compared to subsequent developments. Patria Industries Oyj became a significant part of the Finnish defence material industry in 1998, as the Finnish government saw the fusion as essential to support the national defence industry. However, this policy did not resolve all the problems, as there were still multiple overlapping business areas within Patria Industries Oyj, and some of them lacked strong enough operational structures if operated purely at the national level. In its simplicity, the national basis was insufficient in the late 1990s to support the defence industry (Roiko-Jokela 2023a, 266-269; Roiko-Jokela 2024, 266-269).

Therefore, there was a need to reduce overlapping operations at the national level and reorganise some operations. It is important to note that this would have affected basic defence materials such as gunpowder and ammunition, which were deemed essential for national defence. Since national interests opposed cutting down operations, the option was to reorganize them through international cooperation (Roiko-Jokela 2023b, 266-269; Roiko-Jokela 2023a, 266-269).

This necessitated promoting international cooperation, particularly within the Nordic region, as shown in earlier studies (Lundmark 2003; Roiko-Jokela 2023a, 2023b; Vuola 2013). This was a change in Finnish defence cooperation policy compared to the post-Second World War years when Finland did not participate in defence material cooperation with Norway, Sweden, and Denmark (Lundmark 2003, 209-210), primarily due to foreign political reasons. This situation began to change politically in 1994 when the countries signed a framework agreement concerning defence material cooperation (Sallinen 2005, 29).

This shift in political stance was significant, but more practical industrial solutions, which had a fundamental effect on Finnish defence material policy, were implemented in the late 1990s and

early 2000s (Roiko-Jokela 2022, main Chapter 3; Roiko-Jokela 2023a, main Chapter 3). At this point, some key parts of the Finnish defence industry became part of Nordic Companies (NAMMO AS and NEXPLO AB), and Finland, Sweden, Norway, and Denmark signed a contract aiming to deepen collaboration in defence industry-related situations. Additionally, there was an appendix to the contract between Finland and Norway aimed at defining actions related to NAMMO (Roiko-Jokela 2023, 307).

While this contract formed a basic point of departure for Nordic cooperation, its practical application related to security of supplies was minor at the Nordic level. On the one hand, this is indicated in a report by the Finnish Government in 2022, which stated that security of supply cooperation between Finland and Sweden had been modest, whereas cooperation between Finland and Norway was more active, based on a contract from 2006 (VNS 8/2022) On the other hand, it should be noted that the mentioned action only affected a minor part of the Finnish defence industry, as a significant portion of it did not belong to NEXPLO or NAMMO.

Nevertheless, the contract made in 2001 had its importance when it comes to defence industry. What is essential here is that the contract highlighted the possibility of crises, as it included a clause stating that defence industry in the countries must maintain additional production capacity for crises (Roiko-Jokela 2023, 307). This is important because the contract limited the possibility of cutting down production capacity for basic defence materials (such as gunpowder and ammunitions) that were not needed during normal situations.

Overall, the changes meant that Finnish policy had to adapt to the new situation caused by internationalisation and technological development in the defence industry (see Anteroinen and Lehtonen 2017; Isojärvi 2015). This naturally posed challenges, which are well-described by Niilo Valkonen and Markku Köpsi:

> The contingency planning of companies earmarked for the Defence Forces underwent a transformation as companies started to prioritize their core competencies and began outsourcing parts of production to their partners and subcontractors. In terms of production reservation for exceptional circumstances, it was no longer sufficient to focus solely on reserving one company; it became imperative to identify and reserve the entire domestic supply chain associated with the reservation. (Valkonen and Köpsi 2011, 24)

To comprehend contingency planning, it is crucial to grasp the Finnish security of supply system concerning defence materials. It goes beyond ensuring the delivery security of a specific defence item or system or ensuring that the chosen supplier meets performance standards. Rather, it constitutes a comprehensive system that integrates the country's geographical location, geopolitical position, and historical context. Therefore, defence material acquisitions must be viewed within the broader framework of deepening globalisation, international cooperation, and national capabilities and needs (see also Aaltola et al. 2017; Jaakkola et al. 2021, 187).

Combining National and International Aspects to Create Readiness – the Core of Finnish Defence Industrial Strategy

Finland's evolving operational environment in the early 2010s complicated security policy planning. This necessitated a synthesis of old traditions and new operational realities across various sectors related to the defence industry. Valkonen and Köpsi (2011), 27), representing the Finnish Defence Forces, encapsulated the rationale behind Finnish policy shifts. In 2011, they noted a transition from production-centric to maintenance-centric thinking, from national to international perspectives, and a shift towards dynamic logistics over static storage. Despite these changes, they emphasised the importance of preserving proven and effective elements of old structures and procedures in military economics, particularly in terms of domestic business and industry's ability to support the Defence Forces during both peacetime and conflict.

The Association of Finnish Defence and Aerospace Industries (AFDA), represented by its General Secretary Tuija Karanko, echoed similar sentiments. Karanko (2011) highlighted

Finland's integration into a networked global economy as a member of the European Union, emphasizing the shift from self-sufficiency to interdependence and cooperation. However, she underscored the continued significance of the national defence industry, indicating that:

> Both AFDA and the Ministry of Defence envision the defence industry in Finland as an integral component of the nation's defence and security of supply. They emphasize its specialization and international networking. This desired state entails reducing dependence on procurement from the defence forces and diversifying the industry's customer base and offerings. [. . .] Relying solely on domestic customers can create a vulnerability, akin to being trapped in a confined space. Therefore, internationalisation is deemed essential, serving as the lifeblood of the defence industry. (Karanko 2011, 41)

The Finnish government also echoed these sentiments, summarising the policies carried out in the early 2010s in a similar vein (Suomen puolustuksen teknologisen ja teollisen perustan turvaaminen. Puolustusministeriö. Valtioneuvoston periaatepäätös 2016). According to the government's assessment, Finland, despite and because of not belonging to any military alliance, relied on military conscription and a territorial defence system. While international cooperation was emphasized, the national defence industry retained its significance. The goal was to maintain and evolve critical systems through the national defence industry, blending both national and international dimensions strictly (see also Roiko-Jokela 2022, main Chapter 3; Roiko-Jokela 2023b, main Chapter 3; Roiko-Jokela 2023a, main Chapter 3; Roiko-Jokela 2024, main Chapter 3).

At the national level, efforts were made to integrate the capabilities of the Finnish Defence Forces and the domestic defence industry through various partnership agreements. These agreements aimed to organise operations in exceptional conditions, maintain production reserves, and ensure military security of supply. Moreover, it was imperative to plan and agree upon the distribution of critical resources between the business sector, National Emergency Supply Agency, and the Finnish Defence Forces during normal circumstances, with military security of supply arrangements being tested in exercises (Suomen puolustuksen teknologisen ja teollisen perustan turvaaminen. Puolustusministeriö. Valtioneuvoston periaatepäätös 2016).

However, from the Finnish point of view, there were challenges associated with wider contexts. While there was a willingness for international cooperation in Europe, differing needs, timetables, and budgets among countries made cooperation complex (Karanko 2011, 44, 47; see also Aalto 2011, 49). Additionally, the question of regulatory authority in European-level cooperation posed challenges. European Union article 346 granted member states the right to produce and trade defence materials outside the rules of the European single market, but its interpretation varied among member states, leading to uncertainty regarding the future of European-level defence material markets (Aalto 2011, 50, 52-54; see also Puranen 2021, 159-160; Jaakkola et al. 2021, 173).

Despite the complexity of European Union policymaking in the defence industry, it had evolved, with funding projects aimed at research, technology, and performance becoming possible by 2021. European-level defence cooperation had also deepened, focusing on developing military capabilities and the European defence industrial and technological base. Finnish defence industrial policy viewed European-level cooperation as crucial, given the interconnectedness of European Union policy with wider defence material questions and phenomena (Jaakkola, Karanko, and Korhonen 2021, 172, 174; Jaakkola, Karanko, and Pitkänen 2021, 245).

In the early 2020s, an emerging trend of technological struggle between the United States and China was evaluated to have significant effects on global markets. Both countries had incorporated export control policies for dual-use products into their trade policy tools. In Finland, it was assessed that this development could potentially put companies in a dilemma, forcing them to choose between complying with the national legislation or the European Union's one. This situation was perceived as potentially complicating the global value chains of the industry and dividing the market (Jaakkola, Karanko, and Pitkänen 2021, 245).

One potential solution to mitigate these problems was to pursue an active policy approach, whereby Finland and the European Union would seek to influence the development of export

control primarily through cooperation and international agreements (Jaakkola, Karanko, and Pitkänen 2021, 245). However, this approach faced challenges due to the varying implementation of European Union regulations by member states (246). Consequently, efforts to address international competition and regulations were overshadowed by similar issues at the European level.

The period from approximately 1998 to 2019 could be characterised as an era of significant emphasis on international cooperation and networking in Finnish policy, while maintaining national capabilities in key industrial sectors. From the perspective of the present day, this element remains a prominent feature of Finnish policy, although challenges have emerged. While national interests continue to prioritize cooperation, the early 2020s saw a shift in national security thinking in Finland, which also affected the defence industry.

Indeed, the COVID-19 pandemic significantly influenced Finnish security of supply thinking. The pandemic introduced new challenges, particularly as companies and governments worldwide considered repatriating parts of their production chains to reduce dependence on external sources for raw materials and components. This shift was expected to have a direct impact on Finnish industry exports, needed to support national interests (Jaakkola, Karanko, and Pitkänen 2021, 245-246). Indeed, the emphasis on international dimensions of the defence industry faced challenges due to the pandemic, not only because of potential repatriations but also due to economic considerations.

The defence industry anticipated that defence spending in several countries would decrease in the coming years due to the COVID-19 pandemic, echoing a pattern observed after the 2008 financial crisis, with defence budgets typically adjusting with a delay of a few years. However, countries like Sweden and Great Britain were making significant investments in defence. Despite this, challenges in the export market were expected to persist (Jaakkola, Karanko, and Pitkänen 2021, 246).

The COVID-19 pandemic significantly impacted Finnish defence industry exports, as evidenced by the decrease observed from 2019 to 2021, as depicted in Figure 1 (later on this text). Individuals associated with the Finnish defence sector also interpreted this decline within a broader context, highlighting the vulnerability of global production chains. They expressed concerns about the potential disruption of production due to transportation limitations and travel restrictions. Furthermore, there were reflections on the need for enhanced strategies to ensure the availability

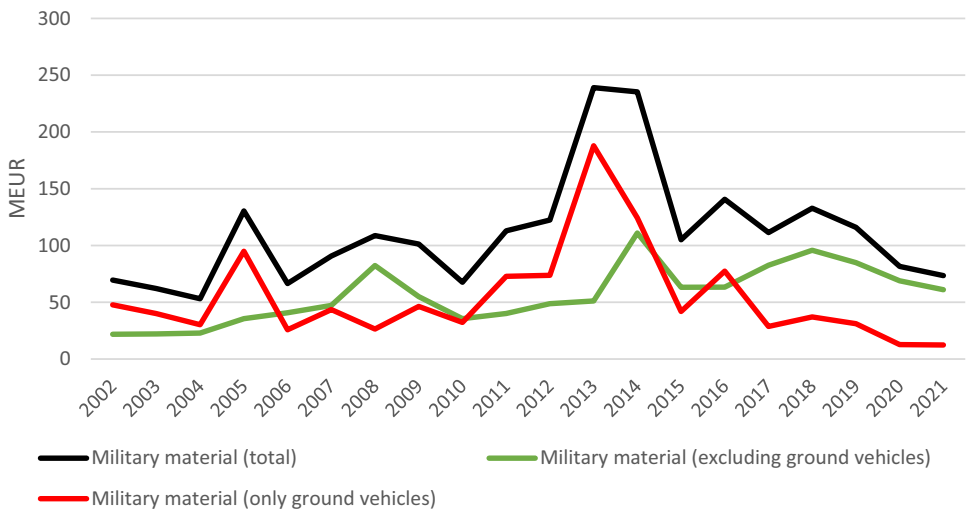

Figure 1. The development of the Finnish defence material exports in million euros in 2002-2021. The prices are fixed in the value of euro in 2021.

of critical materials and raw materials. Additionally, the pandemic raised questions about the extent to which cost efficiency, a fundamental aspect of Finnish policy on international collaboration, could be compromised to prioritize resilience and security of supply. Some even suggested that this situation might lead to policy solutions favouring national defence industries and the 'nationalization' of supply chains (Jaakkola et al. 2021, 195-196).

Despite the challenges, the prevailing idea continued to be rooted in leveraging global networks to develop military capabilities. However, this approach went beyond merely benefiting from these networks; Finland also aimed to actively contribute to them. There was a recognition that Finland's significance as an actor in international cooperation increased when its partners could rely on Finnish actors, cooperation, and policies. Moreover, Finland emphasized the importance of possessing technological know-how to offer its international partners, highlighting the country's commitment to remaining a valuable contributor in the global defence landscape (Jaakkola, Karanko, and Pitkänen 2021, 238).

There was also a clear national interest behind this idea. It was thought that Finland's security of supply would be stronger when the industry's international networks relied directly or indirectly on Finnish defence industry operators and their expertis (Jaakkola, Karanko, and Pitkänen 2021, 239). Therefore, mutual interest was used to secure national interest: The Finnish Defence Forces must be able to ensure needed spare parts, replacement equipment, and ammunition from home and abroad in all security situations. The importance of national industry lied in the fact that turning defence material industrial capacity used for exports to home markets would be much easier than creating any capacity under a crisis (239; as for European level see e.g. Aries, Giegerich, and Lawrenson 2023). This policy was described by considering what would happen if it would not be followed:

> we will lose know-how, and there is a risk that Finland's military security of supply will be highly dependent on foreign operators. Finland's interdependence would weaken, and industrial networks would become weaker. The challenges of the crisis, such as shortages of raw materials and components, would directly affect the functionality and reliability of the Finnish defence system. Ending the export of defence equipment would reduce Finland's position as a responsible party in international cooperation. Additionally, the spin-off effect of the defence industry on civilian industry would cease, and the situation of multi-industry companies would become more difficult. (Jaakkola, Karanko, and Pitkänen 2021, 240)

This policy was Finland's stance before the Russian launched the war against Ukraine in February 2022, at a time when discussions about joining NATO were not as prominent in Finland. The 'NATO option' sufficed, signifying that Finland would not become a full member of NATO but would cooperate with the alliance and adopt a policy that would facilitate a smooth and straightforward membership application if circumstances were to change. One might characterize this approach as getting as close as possible to NATO without becoming a member. It also implied that NATO had an influence on Finnish defence material solutions.

It appears that, based on publicly available texts, Finland's engagement with NATO before seeking full membership was more pragmatic than political, particularly concerning defence material issues. Finland participated in NATO's working groups through its Defence Forces, and nearly all these groups were open to Finland and Sweden (Jaakkola et al. 2021, 194). However, even before applying for membership, there was already an active policy aimed at keeping Finland closely aligned with NATO, both in terms of policy and defence industrial solutions.

Statistical Point of View on Defence Industry – Exports Support National Expertise in Key Production Sectors

As a small country, Finland faces certain challenges, some of which are related to its defence industry. However, individuals involved in defence material matters have identified opportunities within these challenges. In 2021, it was assessed that through joint ventures and projects, significant cost savings, compatibility, and reliability of security of supplies could be achieved. Nevertheless, achieving this required proactive coordination of procurement plans with potential partners and harmonizing performance requirements without compromising secondary objectives. Essentially,

Finland needed to allocate its limited resources through prioritization to accomplish these goals (Jaakkola et al. 2021, 196-197. This can be seen in the exports of the Finnish defence industry.

International cooperation was deemed essential for Finland in the development, construction, and maintenance of defence system capabilities and the security of military supplies (Jaakkola et al. 2021, 196-197). While this highlights one aspect of Finland's participation in defence material cooperation, it does not encompass the entire rationale behind it.

According to opinions from individuals in the defence sector, defence material cooperation is not viewed as an absolute value for Finland, but rather as an enabler and a means to achieve the goals of national material policy. It creates conditions for the development of national defence material capabilities, enhances international compatibility in terms of material, and enables the ability to provide and receive military aid. Additionally, cooperation promotes cost-effectiveness in material procurements and throughout their life cycle (Jaakkola et al. 2021, 185-186).

It is important to note that while cooperation brings benefits to participants, the primary starting point is always national. This means that international material cooperation is carried out based on the priorities of defence administration and the defence and security industry. Participation in cooperation projects is closely tied to these national starting points and aligns with the Finnish Defence Forces' performance needs and development programs (Jaakkola, Karanko, and Korhonen 2021, 186).

Finland's three key partners in defence material cooperation are Sweden, Norway, and the United States because their defence industries play a significant role in building and maintaining the capabilities of the Finnish Defence Forces (Jaakkola, Karanko, and Korhonen 2021, 188). However, while Sweden and Norway may seem like natural partners due to general Nordic cooperation, this is not entirely true in the case of defence material cooperation. Texts dealing with Nordic cooperation suggest that defence material cooperation has not progressed at the same pace as other forms of Nordic collaboration (e.g.2022; see also Vuola 2013).

It is also worth noting that although deepening European cooperation has been viewed positively, those working in the defence sector perceive it as progressing less effectively than other forms of European-level cooperation (Jaakkola et al. 2021, 193). In both cases, the reason for the slow progress is the same: 'Countries have different procurement needs, and the procurement budget cycles also differ from country to country' (193).

Since we have previously argued that international cooperation has been valuable for Finland's defence industrial strategy, there is reason to pay attention to the exports of the Finnish defence industry. International cooperation was and is essential for Finland since it helps support national interests. However, stating it this way might suggest that Finland exports a large volume of defence materials, which is not entirely accurate and oversimplifies the situation. The role of international cooperation is to maintain and develop national expertise, ensure a steady stream of orders for the defence industry, and establish cooperative networks that may prove useful in various situations.

Nevertheless, through statistical analysis, we can gain insights into the Finnish defence industry, including its components and target markets. This information is essential due to the points presented above. International cooperation, and by extension the exports of the defence industry, is part of a broader security agenda and networking strategy. Therefore, statistical analysis reveals which countries are deemed essential from a national perspective and which defence materials have played a central role, not only in terms of sales but also in maintaining national production capabilities.

The basic starting point here is that, at the European level, five major producers dominate the defence materials sector: Great Britain, France, Germany, Italy, and Spain. These countries also direct most of their acquisitions to their domestic industries, with a combined turnover of 1.5 to 1.8 billion euros (see also Jaakkola et al. 2021, 179-180). In comparison, Finland's role in the European defence material industry is modest. As noted by experts who emphasize international cooperation, 'as a rule of thumb, it can be said that Finland accounts for approximately one percent of the common figures of the European Union' (179-180). Nevertheless, it should be noted that Finnish defence material

companies do not derive their turnover solely from defence materials (Jaakkola, Karanko, and Pitkänen 2021, 237). This is also why statistical analysis of companies' turnovers do not give information on business related to *defence materials*. The turnovers also include civilian business that cannot be separated from military business.

What is essential in relation to the previously mentioned points is that despite significant efforts, a truly integrated European internal defence material market has not materialized. Countries with strong domestic defence industries tend to prioritize purchasing from their own markets. As a result, the Finnish defence industry finds significant opportunities primarily in Eastern European countries, which do not have strong domestic defence industries (Jaakkola, Karanko, and Pitkänen 2021, 244). This is an important fact to remember, as Finnish defence industrial exports may not always align with the security partnerships and priorities of geographically or politically closer countries.

Although the Finnish defence material industry represents approximately one percent of the European market and faces significant competition, there has been some increase in Finnish defence material exports over the last 20 years. Specifically, the value of these exports, denominated in euros, has increased by 5.6 percent. This growth rate is relatively modest, especially when compared to the total value of Finland's goods exports, which have increased by 34 percent over the same period.

The development of Finnish defence material exports, adjusted for inflation to 2021 values, is depicted in Figure 1. The figure shows a notable increase in 2013-2014, which might initially draw attention. However, it is crucial to highlight that this growth did not represent a broad-based increase in all Finnish defence material exports. Instead, it was almost entirely driven by a spike in vehicle exports. This indicates that while there have been fluctuations in the export values, the overall trend in the defence sector has been modest compared to other Finnish export sectors.

To understand Figure 1, it is essential to remember that the Finnish defence industry mainly delivers subsystems and components, and only a few companies export main systems (see also Jaakkola, Karanko, and Pitkänen 2021, 237-238). Nevertheless, exports are seen crucial for Finnish defence material industry by people working in defence sector since domestic markets are too small to them. Due to this, exports are crucial for the military security of supplies, enabling Finland to maintain the production capabilities needed for national interests (Jaakkola, Karanko, and Pitkänen 2021, 237-238).

An interesting question is whether there is a correlation between the exports of military vehicles and other defence material exports. Table 1 presents the correlation between different defence material components. The correlation coefficient of vehicle exports with the total exports of defence material is especially high (0.87). This illustrates the fact that vehicle exports dominate the export statistics. This is essential to note when looking at Figure 1. During the years 2013-2014, there was a clear peak in Finnish defence material export values, denominated in euros. Nevertheless, it was not due to a rise in exports as a whole but high demand for vehicles.

In this sense, attention should be paid to the correlation coefficient between the exports of vehicles and other defence material exports to understand the nature of this business sector in the Finnish case. It is particularly low (0.05). This is an essential fact when evaluating the future developments of defence material exports. Based on the exports of vehicle manufacturers (especially Patria Oy) from 2002 to 2021, it is not possible to give an accurate prediction about the exports of

Table 1. The correlation coefficient between the different components of defence material industry. Number of observations $n = 20$.

	Total Exports (Military Products)	Exports of Military Products (without vehicles)	Vehicles
Total Exports	1.0000		
Exports of Military Products (without vehicle)	0.5430	1.0000	
Vehicles	0.8658	0.0498	1.0000

other defence industry sectors. Vehicle exports do not promote other exports, and the correlation between them is non-existent according to statistical analysis.

Therefore, we could argue that within the Finnish defence industry, there are various growth factors. Exports of ammunition will most probably increase in the coming years as the European security situation weakens and European nations need more supplies. The industry's growth is therefore evident. Nevertheless, the future success of military vehicle exports depends critically on Patria Oy's competitive edge in the highly competitive global market of ground vehicles and troop transportation equipment. The success of Patria's 6 × 6vehicle sales will be particularly important for the Finnish defence industry exports and national interests.

When evaluating the current trends of Finnish defence material exports, the above-mentioned correlation – or its absence – is essential to note. In recent years, the Finnish defence industry, particularly Patria Oy, has gained significant vehicle orders. For instance, in 2023, the Finnish Defence Forces announced the purchase of 91 6 × 6armoured vehicles, including equipment, with a total value of approximately 208 million euros. In addition to this, there are also foreign contracts. The Swedish Defence Forces have ordered 20 vehicles, with the first deliveries expected in 2023. Patria Oy's 6 × 6armoured vehicles have been chosen as the platform for a European joint venture for the Common Armoured Vehicle System (CAVS). Currently, Finland, Latvia, Sweden, and Germany actively participate in this venture. In February 2024, Patria Oy announced that cooperation with German companies Defence Service Logistics and Flensburg Fahrzeugbau is expanding. The prospects of CAVS projects are promising.

Based on this, it could be said that the near future of vehicle exports is positive. Nevertheless, as shown in the correlation coefficient analysis above and in Table 1, in the Finnish case, this does not correlate with other defence material exports. Due to this, the future of other Finnish defence material exports should be evaluated independently from vehicle exports. Ammunition exports are not interconnected with the military vehicle industry.

Another interesting question is where Finnish defence material exports go. This can be illustrated in Figures 2 and 3. Figure 2 depicts the total value of defence material exports during the years 2002-2021. According to the figure, Sweden is the most important export destination for Finnish defence materials, with Poland coming in second. Among the top-10 countries, three are from the Middle East (Saudi Arabia, Turkey, and the United Arab Emirates). The United States of America holds the fifth place when it comes to the total value of exports.

The previous paragraph provides a basic understanding of the exports, highlighting that most of the mentioned countries are natural security partners for Finland. However, it does not capture the full picture. Figure 3 shows the 10 most important export countries in 2022. By combining Figures 2 and 3, we can see that export destinations and their positions in the export data vary between the years. For instance, while Figure 2 shows Sweden as the most important export destination, in 2022, Latvia (as seen in Figure 3) holds the leading position, with Sweden only in fifth place (see Puolustusministeriön raportti puolustustarvikkeiden viennistä 2022).

In 2022, a significant percentage of exports (70.4 %) went to European Union member states, while other European countries accounted for 19.9 percent. Thus, nearly 90 percent of defence material exports occurred within Europe in 2022. This also implies that exports to the Middle East were not continuous, as the United States of America was the destination for 15.8 percent of the exports.

While the export destinations vary between the years, the same cannot be said for product types. In 2022, military vehicles (product category ML 6, land vehicles and their components) remained the main exported product type, accounting for 28.4 percent of the total exports. Meanwhile, all firearm articles (product categories ML 3, ML 4, ML 5) combined contributed 33.1 percent of the total exports.

When attention is paid to the number of export licenses (see Figure 4), one can note that small arms ammunition and firearm articles dominate the statistics. Instead, vehicles, the number one product category when measured by value, are only in ninth place. This is quite usual because unit

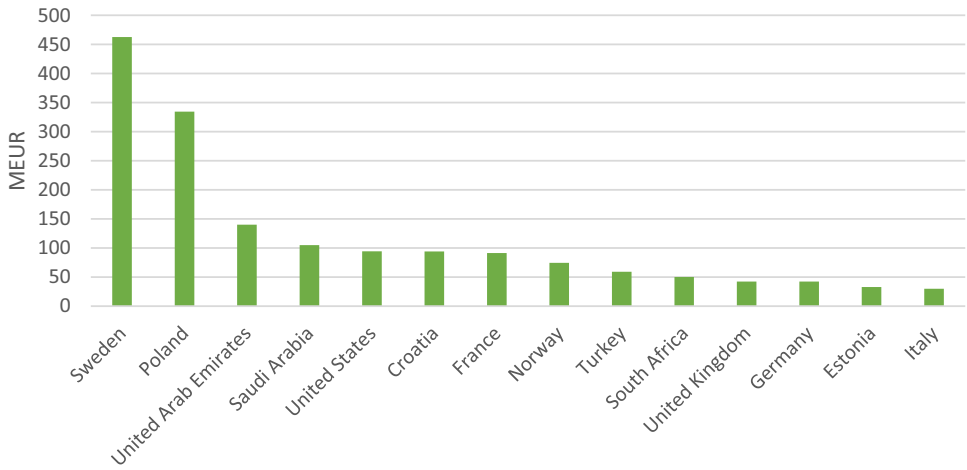

Figure 2. The Finnish defence material exports by country in 2002-2021 (export values are the total from this period).

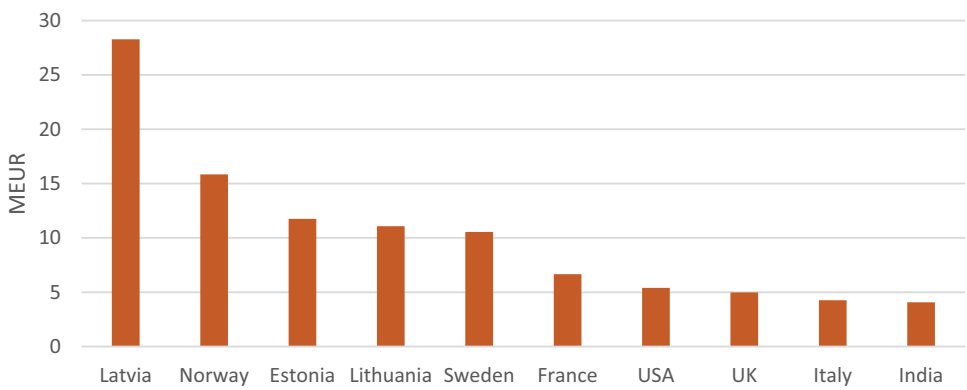

Figure 3. The realized exports of Finnish defence materials by country in 2022.

quantities of vehicle orders are smaller, but their unit price is higher than, for instance, that of cartridges. According to statistics, one could anticipate that an increase in the number of licenses for ammunitions and firearm articles could significantly promote exports in the future.

In its entirety, it could be said, based on statistical analysis, that the Finnish defence material industry has the potential to play a significant role in the Finnish economy. Currently, exports contribute roughly 40 percent of the total defence industrial purchases from the Finnish defence industry. It could be evaluated that Finnish NATO membership could bring about some increase, although NATO itself does not purchase defence material, and its member countries already could buy Finnish products. In 2022, the total value of Finnish defence material exports was 125 million euros. At the same time, total Finnish exports amounted to 7700 million euros, meaning defence materials contributed only 1.6 percent. Nevertheless, within this share lies reasonably significant potential for growth in the future. The exports of vehicles can also be evaluated to increase since Patria Oy's vehicles enjoy a good reputation in international markets, and the current orders could lead to new ones in the future.

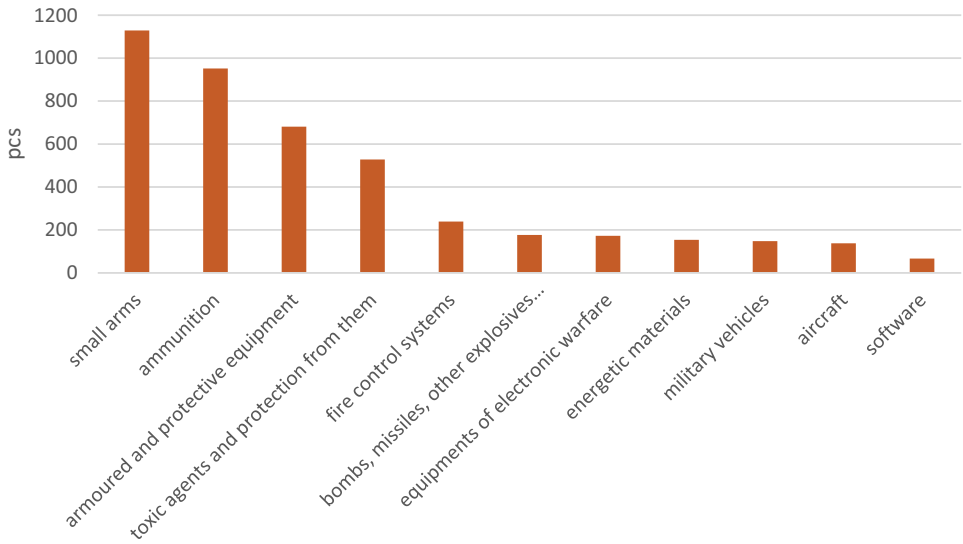

Figure 4. Number of export licences in 2002-2021.

Final Thoughts

The Finnish defence industry indeed has bright prospects ahead. Finland is home to global market leaders in logistics, armoured wheeled vehicles, and turreted mortar systems. Drivers of military equipment exports include recent NATO membership, Baltic security issues, and the Russo-Ukrainian war. The tightening security situation and Russian aggression increase the demand for Finnish ammunition and arms products. Finland has a competitive edge as a reliable supplier of high-quality defence industry products. Additionally, Finnish information technology services and software know-how will also be one potential key growth area for military industry exports. Finnish companies can guarantee long-term service and maintenance support for military products and services with a long-life cycle. Widening and deepening international cooperation and NATO collaborations enable long-term research and development projects, gaining revenue for the future.

It could be evaluated that Finnish defence industries have a bright future. Patria Oy may have prospects for growing global presence as the Patria 6 × 6armoured personnel carrier is gaining international market share due to deepening NATO and CAVS cooperation. As our statistical analysis notes, Finnish military industry exports rely strongly on military vehicle sales, although NAMMO's Finnish operations have gained significant funding due to the Ukrainian war. Therefore, the Finnish Government should support military industry research and technology expenses and enable a smooth export authorization licence policy for Finnish industry products.

A possibility for the Finnish defence industry in the future is to produce very high-quality products with a long-life cycle. This is essential since support during the life cycle of the systems and service activities of the companies are increasingly important to the turnover of the companies. Several countries require industrial cooperation with local companies. This should not be a challenge for Finnish operators, as it mirrors Finland's security of supply thinking: the national history and policy have led to a situation where several companies have ended up with a model where the design work and assembly works are done in the initial phase in Finland, but the manufacturing is transferred to the buyer's country.

However, it could be evaluated that for small and medium-sized companies, the situation is more challenging, since the investment requirement can be significant, making the transaction financially unprofitable for the company. This is essential to note nationally since the Finnish defence industry is dominated by SMEs. This may lead to a situation where the Finnish defence

industry is less likely to be seen as the leader of development projects. If Finland wants to stay at the forefront of technological development in the defence sector and continue the policy described in this paper, particularly in the critical technology areas of national defence, this requires networking with like-minded countries on the part of both the defence administration and industry. One solution for this could be for the Finnish industry to search for export markets globally (note that exports demand permission from the Finnish state). One possible region could be Latin America as it does not have a significant competitive industry of its own, and the countries in the region want to reduce their dependence on suppliers from the United States of America.

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