

Comparative Study of Defense Industries

-Autonomy, Priority, and Sustainability-

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Chapter 1 Japan: “The Pitfall of Investment without Prioritization”

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Chapter 1 Japan: The Pitfall of Investment without Prioritization

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Section 1: Current Status and Issues of the Japanese Defense Industry

Chapter 1 provides an analysis of Japan's defense industrial policy. As mentioned in the introduction, the main question is why a sense of crisis is being expressed by the domestic defense industry despite the recognition of the need to strengthen defense capabilities and the continuous growth of defense expenditures over the past decade. Based on this awareness of the problem, this chapter analyzes the measures being taken by the government to resolve the issues Japan's defense industry is facing and attempts to identify the remaining challenges. In other words, the main focus of this chapter is to present Japan's challenges our policy recommendations in the following chapters will deal with from the perspective of comparing other countries' cases.

1. Persistence of Three Underlying Policies

This chapter analyzes the current status and challenges of the Japanese defense industry and its policies from three levels. The first level is the keystone policies of sustaining small-scale demand for a wide variety of products: import-substitution policy based on indigenization, improvement (*kaizen*)-oriented research and development (R&D), and strict control of arms export. The second level is the structure of the defense industry, which is based on these fundamental policies and is characterized by oligopoly and market division that has remained unchanged for a

long time. The third level is the direct trigger of the crisis, which has surfaced rapidly in recent years under these keystone policies and the structure of the industry, in the absence of any consolidation of demand or strengthening of competitiveness. By incorporating these three levels, this chapter attempts to distinguish and understand the structural factors that characterize the Japanese defense industry and the direct impetus for its decline, and to provide a basis for considering what a more pertinent solution should be.

(1) Import Substitution Policy Based on Domestic Production Policy

In Japan's defense industrial policy, based on the "Basic Policy on the Production and Development of Equipment" (policy for domestic production) formulated in 1970, a policy of import substitution has continued, in which defense equipment that had previously been imported from the United States and other countries is produced domestically through licensed production and indigenous R&D. As a result, a foundation has been established for domestic production of a wide range of defense equipment needed by the Self-Defense Forces (SDF), including aircraft, naval vessels, and land equipment.

However, as the former Three Principles on Arms Exports precluded arms exports and buyers were limited to the Ministry of Defense (MOD), the scale of procurement of individual products did not expand despite the large development costs. This led to the absence of companies specializing solely in defense production at the level of prime contractors. Therefore, as pointed out in the final report released in 2012 by the Study Group on Defense Production and Technology Infrastructure, which is comprised of experts and defense-related organizations, defense industrial policy from a long-term perspective has

been missing in Japan as a result of individual responses to anti-corruption campaigns and financial constraints related to defense procurement¹. While there is a general guideline of "indigenization," few efforts have been made to develop it in a sustainable manner for the defense industry as a whole.

On the other hand, it became difficult to sustain this indigenization policy as a result of the continuous decrease in the defense budget for 10 consecutive years since 2002, the further decrease in the scale of procurement due to the price increase and diversification of defense equipment, and the widening technological gap with U.S. products. Against this backdrop, the "Strategy on Defense Production and Technological Bases" announced by the MOD in 2014 presents the concept of selecting the appropriate acquisition method for defense equipment from domestic development, licensed production, joint development, and imports, depending on the characteristics of the equipment².

Nevertheless, rather than actually changing the policy, the strategy was more in the nature of a confirmation of the reality that had already been present by diverging from the indigenization policy. Furthermore, while referring to the direction of each field of defense production, the strategy described all fields with the tone of favoring domestic production and did not make any bold distinction in the method of acquisition³. This appears to have been done out of consideration for the preferences of Ground, Maritime, and Air Self Defense

Forces in acquiring individual items of equipment, as well as for the companies that manufacture them. However, with the formulation of The Three Principles on Overseas Transfer of Defense Equipment and Technology in the same year, which opened the way for international joint development and exports, the missed opportunity to clearly distinguish and stipulate areas that emphasize domestic production from those that do not led to the half-hearted preservation of small-scale domestic demand for the development and production of various types of defense equipment.

(2) Improvement-oriented R&D

When the indigenization policy through import substitution is viewed from the aspect of technological development, it can be said that Japan has established a domestic technological development base for manufacturing products through licensed production from overseas. In doing so, however, Japan has incorporated its own technologies at the elemental level based on the developments in the domestic civilian field and has improved the performance of its products incrementally. For example, the F-2 fighter jet, based on the U.S.-made F-16 fighter jet, is said to have improved its capabilities by using integrally molded composite materials made of carbon fiber for the airframe and an active phased-array radar for the fire control radar which were indigenously developed⁴.

However, this improvement-oriented technological development does not

¹ Study Group on Defense Production and Technology Infrastructure, "Final Report of the Study Group on Defense Production and Technology Infrastructure - Toward the Construction of a 'Living Strategy'" (2012), 27, <https://www.mod.go.jp/atla/soubiseisaku/soubiseisakuseisan/2406houkoku.pdf>.

² Ministry of Defense, "Strategy for Defense Production and Technology Infrastructure - Toward Strengthening the Foundation for Defense

Capabilities and Proactive Contribution to Peace" (2014), 7-9, <https://www.mod.go.jp/atla/soubiseisaku/soubiseisakuseisan/2606honbun.pdf>.

³ Ibid., 19-26.

⁴ Ministry of Defense, "R&D Vision for Future Combat Aircraft" (August 25, 2010), 11, https://www.mod.go.jp/atla/soubiseisaku/vision/future_vision_fighter.pdf.

necessarily represent an increased ability to independently develop defense equipment as a complex system, even if the incorporated elemental technologies are internationally competitive. On the other hand, this proved to be highly compatible with the conventional defense R&D process.

In Japan, the Acquisition, Technology & Logistics Agency (ATLA) (formerly the Technological Research and Development Institute), which is the research and development arm of the Ministry of Defense, carries out R&D projects by awarding prototype contracts to defense contractors, based on the requests and requirements from the Staff Offices of the SDF, which are the operators of the equipment⁵.

As for the requests for R&D from the Staff Offices, they are supposed to specify operational concepts and requirements for the equipment that needs research and development prior to the requests. This process was a highly predictable and stable mechanism for both the MOD and the companies when using older equipment as the reference model and asking the companies for relatively higher performance in an incremental manner.

On the other hand, such an improvement-oriented approach based on import substitution, coupled with a lack of experience in field deployment, makes it difficult to conceive of completely new operational concepts on defense equipment and requirements that incorporate rapid technological innovation. In addition, as the R&D of defense equipment is set to start with the needs of operators, a mechanism has not been formulated that allows the operators and the R&D side to propose new ideas flexibly and interactively.

If innovative operational concepts and

requirements are not demanded of companies, there is no opportunity for R&D to meet them. For this reason, together with the fact that the international market has traditionally been closed for Japan, it has been difficult for companies to invest in innovative technologies in a proactive manner.

For example, in Japan, the development of unmanned aerial vehicles (UAVs) for defense applications has not been pursued in earnest to date, with the exception of some drones and small rotary-wing UAVs. This is a clear indication of the limitations of the R&D process triggered by the conventional needs of the operators. In other words, since there were no units or personnel in the SDF who specialized in operating unmanned aircraft, it has been difficult to prioritize the demand for such equipment which no existing units represent at the expense of their limited R&D budgets within the SDF. As a result, even though unmanned assets were listed as one of the capabilities to be radically strengthened in the three strategic documents in 2022 due to the need for an overall defense strategy, the foundation for their domestic development and production had not been established⁶.

One of the few exceptions to the improvement-oriented development would be the surface-to-ship missiles (SSMs) that have been deployed in the Ground Self-Defense Force (GSDF) since 1988. Long-range SSMs have taken advantage of Japan's geography of having islands extending from north to south with the aim of deterring and responding to enemy naval advances into the Pacific Ocean and attacks against Japan. In the United States, on the other hand, as the emphasis has been on force projection capabilities by aircraft carrier strike groups, SSMs were not fully equipped until their development

⁵"Instruction on Research and Development of Equipment" Ministry of Defense Instruction No. 37 (2015).

⁶ This situation is finally about to change, as the FY

2024 defense budget request includes the start of research on a combat-support-type unmanned surface vehicle (USV).

by the Army and Marine Corps in recent years. Therefore, there are advantages for Japan in developing these missiles domestically. The development of the improved Type-12 surface-to-ship guided missile capability, currently envisioned as comprising a stand-off defense capability, is also an extension of this development.

In addition, efforts to achieve technological innovation by incorporating advanced civilian technologies (dual-purpose technologies) into the defense sector have not been actively pursued, partly due to a sense of aversion to military research at universities and other research institutions.

(3) Strict Export Control

Last but not least, the former Three Principles on Arms Exports had a significant impact on the Japanese defense industry. The government did not institute a policy of "refraining" from arms exports immediately after World War II, and exports of firearms and ammunition to Southeast Asia were taking place. Even after the former Three Principles on Arms Exports were established under the Eisaku Sato Cabinet in 1967, there were strong requests from the industry to ease restrictions on arms exports when inquiries came in from other countries' militaries, including the Philippine military, following the development of the YS-11, a domestically produced aircraft⁷. Later, in 1971, the export of the V-107s (KV-107s), anti-submarine and rescue helicopters manufactured by Kawasaki Heavy Industries, to the Swedish Navy was also

approved on the grounds that it did not fall under the definition of "arms" for the reason that it did not carry firearms.⁸ Furthermore, following the development of domestically produced defense aircraft such as the C-1 transport aircraft and the US-1 rescue seaplane, Japanese industry moved to seek a relaxation of the former Three Principles with the export of these aircraft in mind⁹. However, this has conversely strengthened the opposition parties' resistance to easing arms export regulations, demanding for stricter ones in the Diet. When asked for an official position, in 1976, the Takeo Miki Cabinet attempted to put out the fire by adopting a policy of "restraint" on arms exports not only to the former Communist bloc countries but also to other countries. In this process, the official view was announced which included an explanation that the strict arms export control had the basis in the spirit of the Constitution¹⁰.

From this point, the policy of restraining arms exports, which had been merely operational criteria of the Foreign Exchange and Foreign Trade Act, became normative in a way that was tied to the Constitution, and commercial exports of defense equipment came to a halt¹¹. In the process, even industries that had once taken a proactive stance toward exports stopped seeking another round of export deregulation to avoid taking a political risk. As a result, Japan's defense industry lost the opportunity to expand demand and missed the opportunity for sustainable ecosystem seen in other industries.

⁷ "'Wait' for the YS-11 exports", *Yomiuri Shimbun* (July 3, 1967).

⁸ "Arms Exports: Background and Issues," *Asahi Shimbun* (February 5, 1976).

⁹ "International Joint Development of Weapons: Proposal to the Government in the Near Future - Keidanren Defense Production Committee," *Asahi Shimbun* (January 6, 1976).

¹⁰ "New Principle for Arms Embargo: Government's Unified View," *Asahi Shimbun* (February 23,

1976); it is also mentioned in a question by Tsunehiko Antaku, a member of the Budget Committee of the House of Representatives (February 27, 1976).

¹¹ Hirohito Ogi, "Defense Equipment Transfer to Strengthen the Defense Industry (I): How Arms Export Restraints Became 'Prohibited' in Conjunction with the Constitution," *Foresight* (August 2, 2023), <https://www.fsight.jp/articles/-/49949>.

2. Preservation of Conventional Industrial Structure

Since 2012, when the second Abe cabinet was formed, the defense budget, which had been on a slight downward trend, began to re-increase. However, the traditional structure of the defense industry has remained intact. The following three characteristics and trends can be pointed out.

(1) Oligopoly Structure Centered on Single-Source Contracts

First, most defense equipment is procured from one company under a single-source contract because of the lack of competition. This is an oligopoly economy in which a large percentage of the amount procured is from a particular major company.

The total amount of defense-related procurement in FY 2020 is estimated to be about 2.5 trillion yen¹². This includes both central procurements, for which the Acquisition, Technology and Logistics Agency (ATLA) signs all contracts, and local procurements, for which the SDF units sign individual contracts. Central procurements relate to the procurement of major defense equipment, and the ATLA publicly announces its awarded contracts every year, making it easy to grasp the breakdown¹³. The actual contract amount for central procurement in FY2021 is estimated at about 1.8 trillion yen.

In FY2021, single-source contracts accounted for 61% of the total central

procurement value, and the top 10 companies in terms of central procurement value, in order of top procurement value, were Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Mitsubishi Electric, NEC, Fujitsu, Toshiba Infrastructure Systems & Solutions Corporation, IHI, Subaru, Hitachi, and Oki Electric Industry¹⁴. The top five procuring companies accounted for 928.5 billion yen in procurement value (the top 10 companies accounted for 1,156 billion yen), which is half of the total central procurement value.

The manufacture of defense equipment requires specialized technology and a large initial investment in the development stage. Thus, the number of such manufacturing companies is limited, not only in Japan but also in other countries. While this in itself is not an immediate problem, reorganization of companies through acquisitions or mergers has seldom taken place in Japan with the exception of shipbuilding companies. Without new entrants, this led to a more fixed structure of manufacturing companies than in other countries. As the policy of indigenization and import substitution has had the effect of fixing contractual relations, the existing industrial structure has been preserved without activating competitiveness.

In addition, the wide variety of equipment produced and the dispersion of production capacity among prime contractors and subcontractors is said to have created a "market division" in the defense industry¹⁵. This may be a factor

¹² Acquisition, Technology and Logistics Agency, "Future Maintenance and Enhancement of Defense Production and Technology Infrastructure," ATLA Defense Technology Symposium 2022 materials (March 14, 2023), https://www.mod.go.jp/atla/research/ats2022/pdf/pr og_policy_05.pdf; "Unsellable Japanese Defense Equipment: Challenges in Promoting Exports and Improving Profit Margins," *Nikkei Veritas* (November 21, 2022), <https://www.nikkei.com/article/DGXZQOCD143U>

[40U2A111C2000000/](https://www.mod.go.jp/atla/research/ats2022/pdf/pr og_policy_05.pdf).

¹³ Acquisition, Technology and Logistics Agency, "Overview of Central Procurement 2022 Edition," 57, https://www.mod.go.jp/atla/souhon/ousho/pdf/ousho_total.pdf.

¹⁴ Ibid., 57, 65.

¹⁵ John Palmer, "Which way now for the Japanese defense industry?" *National Institute for Defense Studies Bulletin* 12, No. 2 & 3 (March 2010), 123, <http://www.nids.mod.go.jp/publication/kiyo/pdf/bul>

hindering the movement toward restructuring and integration of the defense industry, which will be discussed in section (3) below.

(2) Defense Business as a Division of a Company

Second, as already mentioned, defense-related sales are estimated to account for only about 4% of corporate sales on average. For example, the central procurement contracts of the top three companies, Mitsubishi Heavy Industries, Kawasaki Heavy Industries, and Mitsubishi Electric, in FY 2021 amounted to 459.1 billion yen, 207.1 billion yen, and 96.6 billion yen, while the total sales (sales revenue) of the companies amounted to 3860.2 billion yen, 1500.8 billion yen, and 4191.4 billion yen, respectively. As a percentage, they are only 12%, 14%, and 2%¹⁶.

While Japan's defense industry developed and produced products in a wide range of fields due to its domestic production policy, the demand for each product did not grow because arms exports were not an option. Therefore, at the level of a prime contractor, it was difficult to generate the sales necessary to operate as a defense-specialized company or division. As a result, even within a single company, the defense production was not consolidated into a defense-specific division but developed in a manner that shared technology, personnel, and equipment with and depended on the civilian divisions¹⁷.

[letin_j12-2-3_6.pdf](#).

¹⁶ Ibid., 65; Financial information on each company's website.

¹⁷ Junichi Nishiyama, "The Role of the Private Sector in Security," *The Journal of International Security* 36, No. 2 (2008), 25-50.

¹⁸ Keidanren, "Proposals for the National Defense Program Outlines" (April 12, 2022), 2, https://www.keidanren.or.jp/policy/2022/035_honbun.pdf.

¹⁹ Ministry of Defense, "Strategy for Defense

While this in itself is beneficial to the incorporation of civilian technology, it creates a situation in which it is difficult to make bold and focused investments in the defense business. And, as Keidanren points out, focused investment in the defense business tends to be further discouraged as real profits in defense-related businesses are perceived to be inferior to those of the company-wide on average¹⁸.

(3) Industrial Restructuring Issues

In order to break through such a situation and reinforce its international competitiveness, the government has shown its willingness to restructure the defense industry from time to time. In the 2014 Strategy on Defense Production and Technological Bases, it was clearly stated that "industrial restructuring and alliances, such as business collaboration and sector integration, are effective means for companies to strengthen their international competitiveness by allying themselves with one another and for the MOD to improve efficiency in procurement"¹⁹. The Ministry of Finance also stated in its 2018 Subcommittee on Fiscal Institutions document that it will "seek further efficiency and rationalization through means including reorganization of the defense industry"²⁰. Also, in the Medium-Term Defense Buildup Program (FY 2019-23) formulated in 2018, it was stated that "Japan's defense industrial base will be made more efficient and resilient with a view to restructuring and integrating companies"²¹.

Production and Technology Infrastructure," 17.

²⁰ Subcommittee on Fiscal Institutions Document (October 24, 2018),

https://www.mof.go.jp/about_mof/councils/fiscal_system_council/sub-of_fiscal_system/proceedings/material/zaiseia3010_24.html.

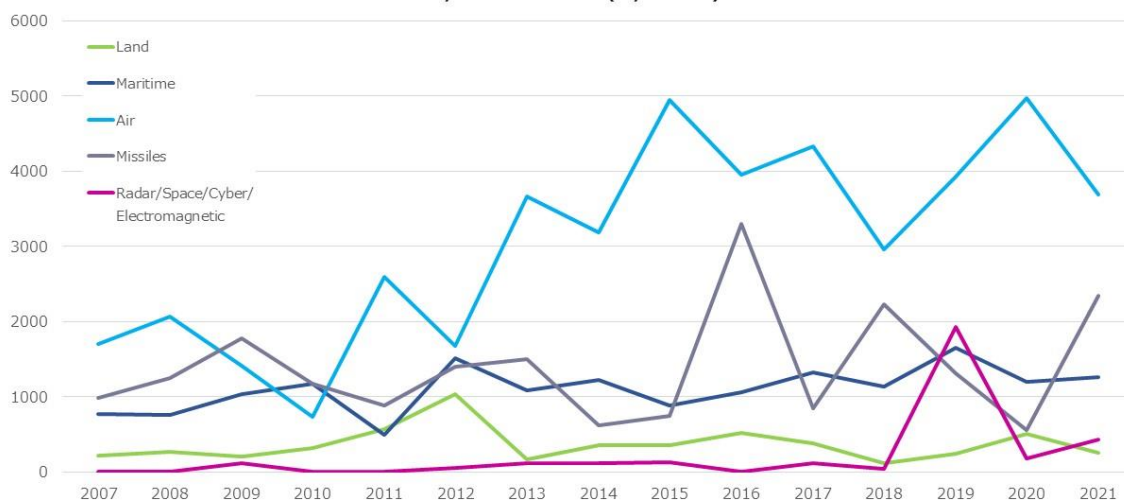
²¹ "Medium-Term Defense Buildup Program (FY 2019 - FY 2023)," (Cabinet Decision on December 18, 2018), <https://www.cas.go.jp/jp/siryuu/pdf/h3135cyuukibo>

However, these policies have remained as declaratory on government documents and have not necessarily resulted in incentives that would change corporate behavior. This is because with the lack of change in the underlying policies described above, an environment for selective and focused investment in development and production in specific sectors has not been established. Therefore, even on the part of the major defense companies, it is difficult to create an economic incentive for them to specialize in defense by absorbing and integrating the defense divisions of other companies resulting in the maintenance of a small but diverse demand.

Against this backdrop, discussions on industrial restructuring linked to defense

procurement efficiency have been extremely limited in recent years, as the business environment surrounding the domestic defense industry has deteriorated due to increased imports of U.S.-made equipment, and as there were appeals for increased defense spending to strengthen defense capabilities. Even the Ministry of Finance, which had been taking the lead in advocating industrial consolidation, did not touch on the issue of industrial restructuring in its submission to the Subcommittee on Fiscal Institutions of the Fiscal System Council in 2022, but instead called for market expansion through arms exports and the need for fair contract pricing²².

Figure 1-1: Trends in the Contracting Volume of Major Defense Equipment in the Central Procurement of the Ministry of Defense (by Area)



Source: Created by the author based on the trends calculated from the total contract amounts for the respective top 10 contract items in the Ground, Maritime, and Air Staff Offices in the annual reports on central procurement contracts released by the ATLA and categorized these into land equipment (such as tanks and vehicles), maritime equipment (such as ships and onboard equipment), air equipment (such as aircraft and aircraft-mounted equipment), missiles (including missiles mounted on land, sea, and air equipment), and radar/space/cyber/electromagnetic waves (such as ground radar, EW equipment, and space-related equipment). Figures are in hundreds of millions of yen (nominal). See ATLA, "Central Procurement top page, releases", <https://www.mod.go.jp/atla/souhon/supply/jisseki/index.html>.

[ueiryoku.pdf](#).

²² Document submitted to Subcommittee on Fiscal Institutions, Fiscal System Council (October 28, 2022),

https://www.mof.go.jp/about_mof/councils/fiscal_system_council/sub-of_fiscal_system/proceedings/material/zaiseia2022_1028.html.

3. Direct Trigger of the Crisis: Changing Defense Requirements and a Rapid Increase in Imports from the United States

Since FY 2012, Japan's defense budget has begun to increase. Accordingly, expenditures for the procurement and maintenance of defense equipment have also increased, but this did not necessarily mean that the domestic defense industry was booming. Rather, it took the form of a change in the quality of equipment required for defense and a corresponding surge in imports of foreign-made equipment, which dealt a blow to the defense industry, especially land equipment manufacturers and aircraft subcontractors, whose traditional structure mentioned above remained intact.

(1) Impact of Changes in Defense Requirements

First, as Japan's defense posture has shifted its emphasis from territorial defense since the Cold War to forward denial at greater distances, the types and weight of defense equipment required have also changed rapidly. Specifically, compared to land equipment such as tanks and armored vehicles, more maritime and aerial equipment, missiles, and space, cyber, and electromagnetic-related items are now procured. For example, of the actual central procurement contracts for FY 2021, those for the GSDF amounted to 311.5 billion yen, the Maritime Self-Defense Force (MSDF) to 633.0 billion yen, and the Air Self-Defense Force (ASDF) to 620.7 billion yen, making the amount procured by the GSDF the lowest among the three SDF categories. Focusing on the types of equipment, out of the 10 major equipment procured by the GSDF, whose value adds to 126.6 billion yen, those related to aerial equipment, missiles,

and electronic warfare account for 74%. Looking at the transition of major equipment procurement since FY2007, the amount of defense-related expenditures for land-based equipment has generally remained at around 20-30 billion yen over the past 15 years, despite the trend of increasing defense-related expenditures. In contrast, the increase in defense-related expenditures has been absorbed by the increase in procurement of aircraft and missiles.

This relates to the fact that Komatsu Ltd., which has manufactured armored vehicles such as Light Armored Vehicles (LAVs) and Type 96 Armored Personnel Carriers, and Sumitomo Heavy Industries, which has manufactured machine guns, are among the companies that have been pointed out as withdrawing from the defense business²³. This is because it is becoming increasingly difficult to secure corporate resources and gain the understanding of management and stakeholders in the absence of prospects for sales expansion through defense procurement. And the fact that procurement of ground vehicles and other land equipment, whose products have relatively low unit prices and require thin margins, is declining is likely to have a significant impact on the management decisions of companies.

If so, it is necessary to recognize that while business withdrawal is an issue that runs through the entire Japanese defense industry, it also stems largely from changes in the defense posture that accompany changes in the industrial structure. In fact, for the successor equipment to the GSDF Type 96 Armored Personnel Carrier, the Patria AMV of Finland, rather than a prototype vehicle manufactured by Mitsubishi Heavy Industries, was selected following the cancellation of the development of a project in which Komatsu Ltd. had

material.

²³ Acquisition, Technology and Logistics Agency, ATLA Defense Technology Symposium 2022

participated.²⁴ Also, due to the withdrawal of Sumitomo Heavy Industries, which had manufactured machine guns for the GSDF, the MINIMI (B) 5.56mm machine gun manufactured by FN Herstal of Belgium was selected for the succeeding machine gun²⁵. With changes in the defense posture, some fields of land equipment are emerging where economies of scale do not work, and procurement by domestic production has economic limitations. In such areas, foreign products are selected based on a case-by-case basis.

(2) Predicament of Domestic Subcontractors of Aircraft Manufacturing Due to the Increase in Imports

Second, changes in the quality of equipment needed for defense have led to a rapid increase in the procurement of equipment imported from abroad, primarily through U.S. Foreign Military Sales (FMS). The share of domestic procurement in the defense budget's procurement expenditure, which was 89.3% in FY 2014, has dropped to 76.5% in the FY 2023 budget²⁶. In addition, the trends in the total contract value for the 10 major items for each of the Ground, Marine, and Air Self-Defense Forces in central procurement show that the value of imported equipment began to increase rapidly from FY 2012, with the total contract value of major imported equipment exceeding that of domestically produced equipment for the three years from FY 2018 to FY 2020. This trend was particularly seen in aircraft, with the total contract value of major imported aircraft continuing to exceed the total contract

value of major domestic aircraft for the five years from FY 2016-2020 (in FY 2019, 60% of major contracts and 90% of major aircraft contracts were imported ones).

A breakdown of aircraft imports shows that the bulk of imports are large procurements of advanced aircraft from the United States, including the F-35A fifth-generation fighter jets, the E-2D early-warning aircraft, the KC-46 aerial refueling and transport aircraft, and the V-22 Osprey tiltrotor aircraft. These trends indicate that fewer and fewer of the sophisticated defense equipment needed for Japan's defense can be manufactured by domestic companies.

Traditionally, only a few Japanese defense aircraft have been purely domestically developed, and most, such as fighter jets and rotary-wing aircraft, were manufactured by domestic companies through development based on US-made aircraft, joint development, or licensed production. One of the reasons why imports through FMS and other means have become the mainstream is that, in addition to the increasing sophistication of technology required for defense, the expansion of development costs in US developers has made it difficult for technology transfer through licensing to be accepted. For example, in Japan, Mitsubishi Heavy Industries plays only a role of the final assembly and inspection (FACO) of the F-35A, but the United States does not allow licensed production. Another factor related to the situation on the Japanese side is that fiscal constraints have made it difficult to choose relatively expensive licensed production and domestic development. The Ministry of

²⁴ Ministry of Defense, "Determination of the Type of Vehicle for the Next Generation of Wheeled Armored Personnel Carrier (Personnel Transport Type)," December 9, 2022, <https://www.mod.go.jp/atla/pinup/pinup041209.pdf>

²⁵ Ministry of Defense, "Results of Selection of

New Important Equipment" (January 23, 2023), <https://www.mod.go.jp/j/press/news/2023/01/23e.pdf>.

²⁶Acquisition, Technology and Logistics Agency, ATLA Defense Technology Symposium 2022 material.

Finance considers it a problem that the acquisition method is narrowed down by the MOD when selecting defense equipment, and has advocated that the procedure for selecting the most appropriate acquisition method from domestic development, licensed production, and imports from the standpoint of procurement efficiency should be made transparent²⁷. In response, the MOD issued an instruction in 2019 to clarify the procedures for selecting defense equipment and regularly publish the results of the selection of each equipment, as well as the details and reasons for their consideration²⁸.

These developments have had no small impact on subcontractors and companies other than the traditional aircraft manufacturing prime contractors. Primes can mitigate the economic impact of the decline in domestic production to some extent by playing a role in the U.S. FMS, for example, Mitsubishi Heavy Industries, which is in charge of FACO for the F-35A. On the other hand, such an effect does not extend to their suppliers, who have traditionally played a subcontracting role in the manufacture of domestically produced aircraft, leading to a worsening of the business environment for them.

This is related to the fact that aircraft-related suppliers account for many of the companies currently indicated to be exiting the defense business. Most recently, Daicel, which manufactures aircraft ejection seats and fabricated products, in

2020, Yokogawa Electric, which manufactures aircraft displays, in 2021, and Kayaba, which manufactures hydraulic equipment for aircraft, decided to withdraw in 2022. Shimazu, which manufactures aircraft components, particularly equipment for flight control and air conditioning, is also reportedly considering withdrawing from the aircraft components business.

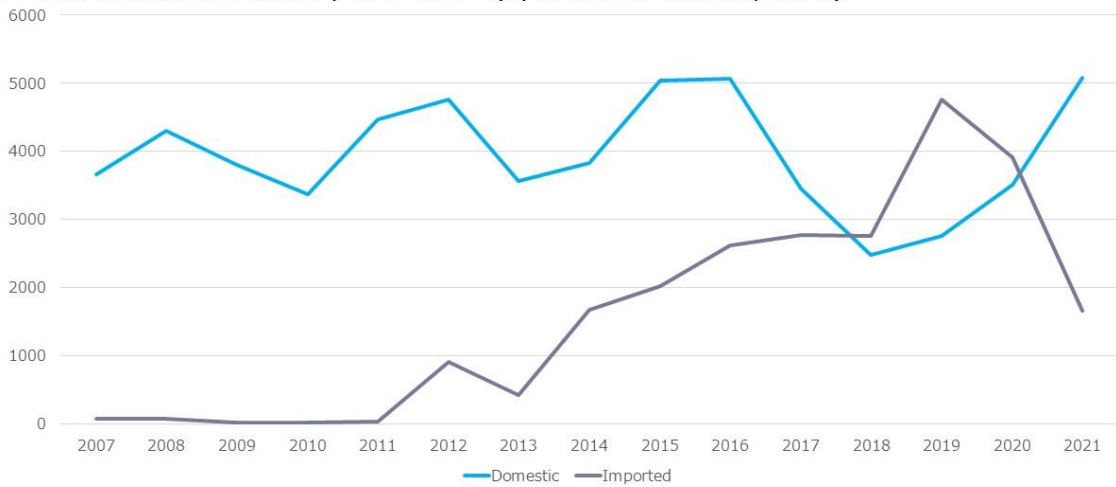
However, behind the withdrawal or the consideration of withdrawal of these aircraft component suppliers are a number of other complex factors besides the decrease in the procurement value of domestically produced defense aircraft. In addition to the sharp decline in the value of major contracts for domestic aircraft mentioned above, some companies have recently been affected by the drop in demand for commercial aircraft manufacturing due to the impact of Covid-19, since the sectors to which their defense-related businesses belong are also engaged in civilian business²⁹. The divisions that include the defense business of these companies have traditionally posted very low-profit margins that have sometimes resulted in losses, but the decline in sales of domestically produced products and the deteriorating performance of the civilian businesses within these divisions have accelerated this trend, and have encouraged the decision to withdraw from the defense business as a whole or within the division.

²⁷ The document submitted by the Ministry of Finance, Working Group on Expenditure Reform, Subcommittee on Fiscal Institutions, Fiscal System Council (October 23, 2019), https://www.mof.go.jp/about_mof/councils/fiscal_system_council/sub-of_fiscal_system/proceedings_sk/material/zaiseier20191023/05.pdf.

²⁸ Ministry of Defense, "Results of Selection of New Important Equipment" (January 23, 2023), <https://www.mod.go.jp/j/press/news/2023/01/23e.pdf>.

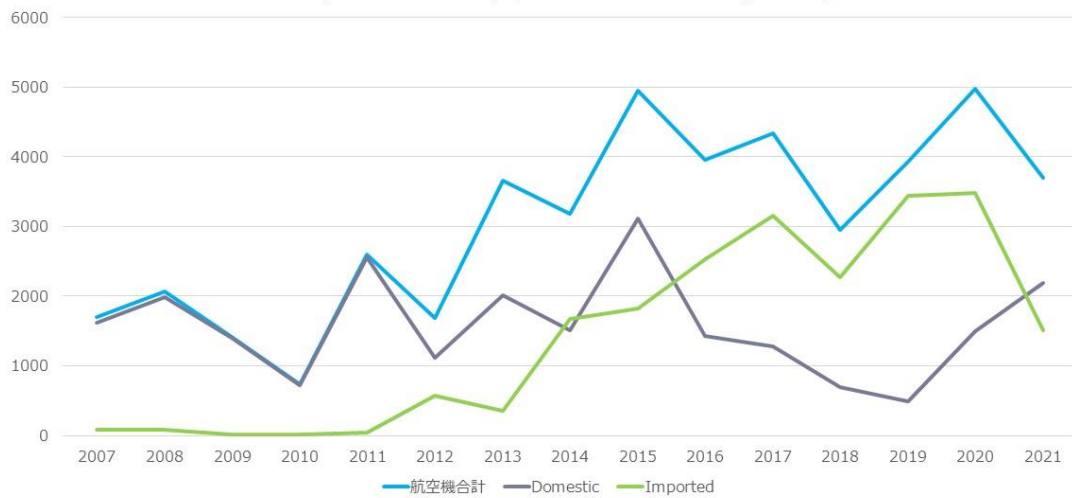
²⁹ For example, SHIMAZU, Yokogawa Electric, and KYB have described the decrease in demand due to the impact of COVID-19 in their annual integrated reports.

Figure 1-2: Trends in the Contracting Volume of Major Defense Equipment in the Central Procurement of the Ministry of Defense (by Domestic and Imported)



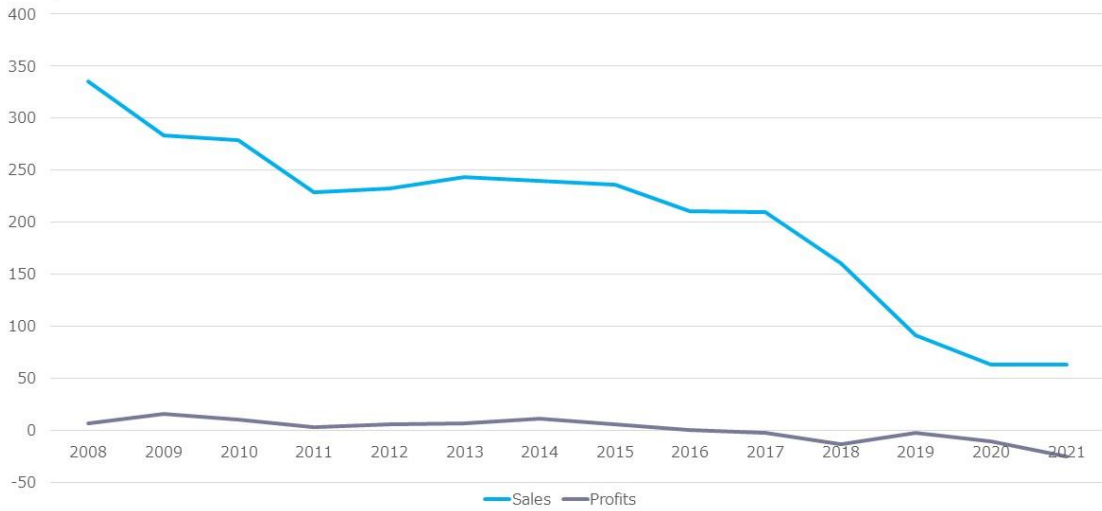
Source: Created by the author based on the trends calculated from the total contract amounts for the respective top 10 contract items in the Ground, Maritime, and Air Staff Offices in the annual reports on central procurement contracts released by the ATLA and categorized into domestic and imported products. Note that contracts with domestic trading companies importing overseas products are counted as "imported". Figures are in hundreds of millions of yen (nominal). See ATLA, "Central Procurement top page, releases", <https://www.mod.go.jp/atla/souhon/supply/jisseki/index.html>.

Figure1-3: Trends in the Contracting Volume of Major Defense Aircraft in the Central Procurement of the Ministry of Defense (by Domestic and Imported)



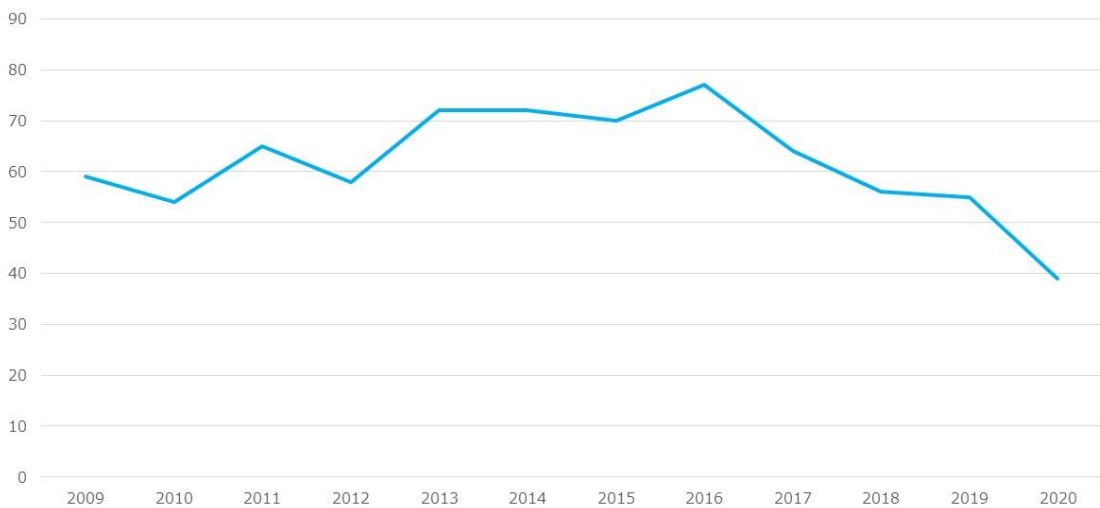
Source: Created by the author based on the trends calculated by extracting only air equipment from the total contract amounts for the respective top 10 contract items in the Ground, Maritime, and Air Staff Offices in the annual reports on central procurement contracts released by the ATLA and categorized into domestic and imported products. Note that contracts with domestic trading companies importing overseas products are counted as "imported". Figures are in hundreds of millions of yen (nominal). See ATLA, "Central Procurement top page, releases", <https://www.mod.go.jp/atla/souhon/supply/jisseki/index.html>.

Figure1-4: Trends in the Sales and Profits of the Aircraft Division of Yokogawa Electric Corporation.



Source: Created by the author based on the YOKOGAWA Reports and sales and profits of the division of the aircraft and others in the Factbooks. Figures are in hundreds of millions of yen (nominal).
<https://www.yokogawa.co.jp/about/ir/shiryō/annual-ja/>; <https://www.yokogawa.co.jp/about/ir/shiryō/factbook-ja/>.

Figure1-5: Trends in the Sales of the Aircraft Division of KYB Corporation.



Source: Created by the author based on the segment information of the "aircraft equipment business" and the "financial and performance information" as well as the data from the "financial results briefing" for each fiscal year. Profit figures are omitted due to the lack of data from fiscal year 2009 to fiscal year 2016, for which sales figures are available although from fiscal year 2017 to fiscal year 2021, the segment profit had consistently been in deficit.
<http://www.kyb.co.jp/ir/financial.html>; <https://www.kyb.co.jp/ir/financialresults.html>.

(3) Profit-Earning Structure Susceptible to International Economic Changes

The above two points can be considered direct triggers of the recent difficulties surrounding the domestic defense industry, but a factor that amplifies the situation is the weak profit-earning structure in defense procurement, which has been frequently pointed out by the industry.

Since most defense equipment does not have a market price, the MOD calculates the price of the product by multiplying the costs, based on estimates by the company, by the profit margin and other factors, based on the "cost accounting method"³⁰. This profit margin is calculated based on the standard profit margin (about 7.2%), which is the average profit margin of companies in the black within the industry to which the contractor belongs.

This mechanism covers the costs associated with the manufacture of the product, and the profit margin which does not include loss-making companies. Therefore, as the Ministry of Finance pointed out in the Subcommittee on Fiscal Institutions document, the pricing system seems to be more generous than in other industries³¹.

On the other hand, according to Keidanren, if an unexpected cost increase occurs during the performance of a contract after it has been concluded, the company is forced to bear the portion of the cost increase from its profits, resulting in a decline in the actual profit margin and ultimately causing the company to decide to withdraw from the defense business³². This is one of the reasons why companies are deciding to withdraw from the defense business. To address this issue, Keidanren has called for the introduction of "a mechanism for contract modification or

post-delivery settlement that can reflect inevitable cost increases that occur during contract performance (such as a significant increase in the price of materials and parts)," and the MOD is partially responding to this request, as described below.

However, this is a structure that has existed for a long time and is not a sufficient factor to explain the recently discussed plight of the defense industry. In this regard, there are two trends that have become particularly pronounced over the past decade.

First, in light of the price increases in the United States and other countries as well as the trend toward a weaker yen over the past decade that affects imported parts and materials, a tendency exists for the cost of defense equipment to increase with each year. Therefore, the time interval difference between the time of cost estimation from companies necessary for pricing by the MOD prior to the contract and the time of actual ordering of parts and materials after the contract is signed will result in substantial price discrepancies. Furthermore, the production of defense equipment is rarely completed in a single year, and many have contract terms that extend over multiple years. Therefore, unless subcontract manufacturers and imported materials are ordered promptly after the contract is signed, cost increases will be a natural consequence. Yet if the prime attempts to shorten the retention period of such parts and materials due to considerations for the costs required for inventory management or financial indices, the timing of order placement may be pushed back further, leading to higher costs.

Second, the Ministry of Finance points out that for major domestically produced defense aircraft, even if domestic

³⁰ "Instruction Concerning Standards for Calculation of Estimated Prices of Procured Goods," Japan Defense Agency Instruction No. 35 of 1962, Articles 74-76.

³¹ Document submitted to the Subcommittee on Fiscal Institutions (October 28, 2022).

³² Nippon Keidanren, "Proposals for the National Defense Program Outline," 4-5.

companies are responsible for manufacturing and assembling the finished products, approximately 40-60% of their parts and components are imported.³³ In other words, the rising prices of imported parts cause the unit price of the aircraft as a whole to soar, and the unit price is also susceptible to the direct effects of rising prices in the country from which the parts are imported and the depreciation of the yen. For example, the price of certain imported parts for the C-2 transport aircraft and the P-1 patrol aircraft has risen by 300% since the beginning of first production, and the price of certain imported parts for the UH-60JA/J multi-purpose aircraft has soared by more than 900%. On the other hand, some domestic parts have also increased in price by 100-300% since the start of mass production, and the main reason for this is that the components of these parts are imported, and the price of such components has further increased.

Given this background, it can be said that not only are the profits of the primes themselves susceptible to the price hikes of imported parts, but domestic parts suppliers are also likely to see their profits squeezed due to the effects of both the price reduction demands of the primes and the price hikes of the imported components that make up the parts. This low-profit structure, which is one of the reasons why some aircraft parts suppliers are withdrawing from the market or considering doing so, is not so much a result of the profit margin under the pricing system itself, but rather the vulnerability of the industry to price hikes in imported parts and materials³⁴.

³³ Document submitted to the Subcommittee on Fiscal Institutions, Fiscal System Council (November 15, 2022), 18-19, https://www.mof.go.jp/about_mof/councils/fiscal_system_council/sub-of_fiscal_system/proceedings/material/zaiseia20211115/01.pdf.

³⁴ "Shimazu to Withdraw from Manufacturing Parts for Air Self-Defense Force...Low Profitability

In this sense, it can be assumed that the continuous price hikes in the United States over the past decade and the trend toward a weaker yen have spurred the above-mentioned factors of changing defense requirements and surging imports from abroad, which have prompted the decline of the domestic defense industry.

(4) Indigenously Developed Products that are not Suitable for Export

When domestic demand declines, a typical industry would have no choice but to find a way to export its products overseas. However, Japan's defense industry has long been under the policy constraint of refraining from exports under the former Three Principles on Arms Exports. Thus, even after the government formulated the Three Principles on Overseas Transfer of Defense Equipment and Technology in 2014, which allows for partial export of defense equipment, many companies have not been able to change their traditional business models and turn to commercial exports, with the exception of Mitsubishi Electric's export of the air surveillance radar system to the Philippine Air Force.

Various factors have been pointed out as contributing factors, including the lack of international competitiveness due to the long history of being adapted to the requirements of the SDF and high prices for small-lot production, the absence of export strategies, and the need for public-private partnerships and government initiatives³⁵.

However, the underlying premise shared

Makes Defense Business Difficult to Continue," *Yomiuri Shimbun* (November 1, 2022), <https://www.yomiuri.co.jp/economy/20221101-OYT1T50156/>.

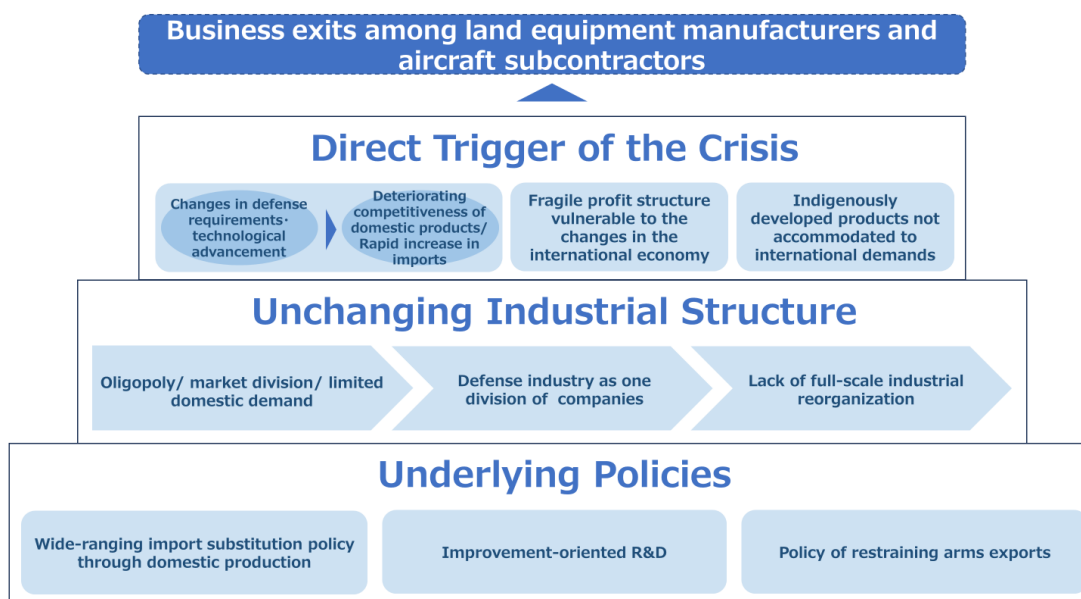
³⁵ "Unsellable Japanese Defense Equipment: Challenges in Promoting Exports and Improving Profit Margins," *Nikkei Veritas* (November 21, 2022), <https://www.nikkei.com/article/DGXZQOCD143U>

by these points is that the Japanese defense industry started out by substituting domestic production for imports from the United States and other countries, and has not developed defense equipment with unique strengths domestically since then. The C-2 transport aircraft and P-1 patrol aircraft are examples of the cases where the pursuit of exports has been considered, but they have not always been perceived as having unique strengths compared to foreign competitors, such as the U.S.-made C-17 transport aircraft and P-8 patrol aircraft. Furthermore, in about 40 years that Japan has refrained from exporting defense equipment, major countries have been accumulating a track record and securing their share of the international market, making it extremely difficult for a latecomer to immediately capture that share without a significant advantage in

terms of performance and price³⁶. In addition, with the recent trend of an ever-increasing share of U.S. arms exports, the strengths of latecomer exporters will naturally be limited³⁷. On the other hand, defense equipment such as long-range SSMs missiles, which do not have many similar roles overseas, are not allowed to be exported due to the current Implementation Guidelines under the Three Principles³⁸.

Therefore, as neither industry nor government policy has adopted a conscious strategy to appeal to the international "strength" of Japan's defense equipment, even if the ban on exports were partially lifted, it has yet to function as a fill-in for domestic demand, which is on a receding trend.

Figure 1-6: Structure of the Decline of Japan's Defense Industry



[40U2A111C2000000/](https://www.fsisight.jp/articles/-/49951)

³⁶ Hirohito Ogi, "Defense Equipment Transfer to Strengthen the Defense Industry (II): The Existence of the United States as a Giant, and the Strategy for Japan as a 'Latecomer'," *Foresight* (August 3, 2023), <https://www.fsisight.jp/articles/-/49951>.

³⁷ According to the Stockholm International Peace Research Institute (SIPRI) Yearbook, U.S. arms exports in the past five years accounted for 40 percent of that of the world as a whole, significantly higher than the 33 percent in the

previous five years, due in part to a decline in exports by Russia. SIPRI, "SIPRI Yearbook 2023 Summary," 10-11, https://www.sipri.org/sites/default/files/2023-06/yb23_summary_en_1.pdf.

³⁸ Under the Implementation Guidelines, commercial exports of domestically produced defense equipment will be only permitted for the so-called "five categories": rescue, transport, warning, surveillance, and minesweeping.

Section 2: Government Initiatives and Remaining Issues

In Section 2, based on the issues discussed above, we analyze the initiatives introduced by the government to solve these problems, and then aim to identify whether there are still elements missing, and if so, what they are.

1. Government Initiatives

To address these issues, the government has proposed the following initiatives.

(1) R&D to Incorporate Advanced Civilian Technologies

First, with regard to the challenge of transforming defense R&D from a rigid, improvement-oriented approach to an innovative one adapting to new types of warfare, a framework for "operational verification-type research" was established in 2015, which is to be conducted flexibly through "close collaboration between operators and the R&D section"³⁹. This has formalized the flow of proposing R&D of defense equipment not only on the initiative of the operators but also on the initiative of the R&D section and aims to facilitate R&D that reflects needs by closely involving the operators in the testing and evaluation of the products. The development of the Hyper Velocity Gliding Projectile, which is also envisioned as a means of stand-off defense capability, is an example of this framework, and the shortening of the time required to equip the weapons through simultaneous studies of operations and technology is cited as an advantage⁴⁰.

Recognizing the importance of incorporating advanced civilian technologies into defense equipment, in FY 2015, the Innovative Science and Technology Initiative for Security (Funding Initiative) was initiated to

publicly solicit basic research on emerging civilian technologies and provide funding to the selected recipients. The budget allocates approximately 11 billion yen each fiscal year (in FY2022, this accounts for about 7% of total defense R&D expenditures), and is provided to universities, companies, and other research entities that have been selected through public solicitation of research themes. There are both large-scale and small-scale research projects, and each project is conducted for one to five years.

Furthermore, the three strategic documents released at the end of 2022, based on the recognition that we are in an "era where victory or defeat is determined by the mastery of new ways of warfare underpinned by advanced technologies" (National Defense Strategy), set forth the need for "actively leveraging the outcomes of advanced technological research in the public and private sectors for research and development of defense equipment" (National Security Strategy) and to "intensively invest in equipment/technology fields [...] that are directly linked to future warfare" (Defense Buildup Program). To this end, the documents state that efforts will be made to promptly equip technologies possessed by companies, both in defense and non-defense industries, and to establish a framework for the active utilization of emerging civilian technologies owned by start-up companies, domestic research institutions, and academia (National Defense Strategy).

The three strategic documents also included the creation at the ATLA of a new research institute to produce equipment that will lead to defense innovation. The new research institute is to be launched in FY2024, modeled after the Defense Advanced Research Projects

³⁹ "Instruction on Implementation Guideline for Operational Verification-Type Research" (Sougikei No. 242. 10.1.2015).

⁴⁰ Koichi Fukuda, "Current Status and Future

Prospects of Hyper Velocity Gliding Projectile," <https://www.mod.go.jp/atla/research/ats2019/doc/fukuda.pdf>.

Agency (DARPA) and the Defense Innovation Unit (DIU) in the United States, in order to "link various fast-changing technologies to innovative functions and equipment that will significantly change the way we fight in the future"⁴¹.

One of the R&D activities that the new research institute is expected to take on is "the Translational Research on Advanced Technologies," which will bridge the funding gap between basic research that can be applied to the defense field, which has been promoted through the MOD's Funding Initiative, and full-scale development involving the manufacture of prototypes. In the FY 2023 budget, 18.8 billion yen was allocated for this framework and the research on underwater wireless communication technology that can be used for unmanned underwater vehicles (UUVs) was funded. In addition, although the details are not known, the FY 2024 defense budget request included 11 billion yen for the start of "the breakthrough research," which takes certain risks to study technologies that will change the way of warfare in the future⁴². Furthermore, while only the direction of the initiatives has been presented so far, researchers, operators, and policymakers involved are prompted to work together to promote projects of high policy importance, and the MOD is declaring to accept proposals from companies and others at any time⁴³.

Finally, in the "Defense Technological Guidelines" released by the ATLA in June 2023, which replaced the Defense Strategy and Medium- and Long-Term Technological Estimates released in 2016, the direction of strengthening the defense

technology base includes the early creation of necessary equipment and functions and securing technological superiority, while also emphasizing transformative innovation for defense. To this end, the Guidelines state that a framework should be established to envision future ways of warfare together with other actors such as operators, and to promote projects in cooperation with a wide range of technical experts and start-ups. The Guideline also identifies 11 key technical areas of future warfare, including the use of platforms in areas that have not been used conventionally⁴⁴.

(2) Defense Production Base Reinforcement Act and Supply Chain Resiliency

Second, in June 2023, the Diet passed the Defense Production Base Reinforcement Act, which sets forth measures to strengthen the defense industry. Under the Law, (i) conducting a survey of the defense industry supply chains and an obligation for companies to make the best efforts to respond to the survey, (ii) financial support from the government to pay for the necessary expenses to strengthen the supply chains (e.g., diversification of supply sources), improve the efficiency of manufacturing processes, enhance cyber security, and take over business operations, (iii) A system in which the government retains defense equipment manufacturing facilities and outsources their operation to other companies when there is no other way in the face of a company withdrawing from a business. In the FY 2023 budget, 36.3 billion yen was appropriated for

⁴¹ Ministry of Defense, "Progress and Budget for the Reinforcement of Defense Capabilities: Overview of FY2024 Estimates," 34, https://www.mod.go.jp/j/budget/yosan_gaiyo/2024/yosan_20230831.pdf.

⁴² Ibid.

⁴³ Ministry of Defense, "Japan's Defense and

Budget: Overview of the FY2023 Budget," 33, https://www.mod.go.jp/j/budget/yosan_gaiyo/2023/yosan_20230328.pdf.

⁴⁴ Ministry of Defense, "Defense Technological Guidelines 2023" (June 2023), https://www.mod.go.jp/j/policy/defense/technology_guideline/index.html.

implementing these measures.

The financial support stipulated in the Defense Production Base Reinforcement Act is envisioned as a method to encourage domestic production of parts, technologies, and equipment and diversification of supply sources so as to reduce risks associated with supply chains, or R&D of alternative parts. At the same time, it is also intended to encourage more efficient manufacturing processes by covering the costs of introducing innovative manufacturing technologies such as artificial intelligence and 3D printers (additive manufacturing).

Meanwhile, the "Basic Policy on Strengthening the Base for the Development and Production of Defense

Equipment" (hereinafter referred to as the "Basic Policy"), while acknowledging that there are "cases in which acquisition by domestic production is difficult," with the sophistication of the technology in mind, does not mention the perspective of economic rationality or technological superiority of procuring from domestic sources⁴⁵. Moreover, while there are examples of fields in which domestic production is pursued, there is no mention of fields in which domestic production should not be pursued.

Meanwhile, in addition to the Law, the Ministry of Defense and the Ministry of Economy, Trade and Industry (METI) have established a committee to promote the entry of start-up companies into the defense sector and will promote matching with conventional defense companies in the future⁴⁷. They have also begun offering long-term loans to small and medium-sized enterprises using funds from the Japan

Finance Corporation and other financial institutions⁴⁸.

(3) Initiatives to Increase Profit Margin

Third, with regard to improving the profit margin, which has been pointed out as an issue in defense procurement, it was decided to modify the current pricing rule to add a profit margin ranging from 5% to 10%, depending on the MOD's evaluation of company performance, including quality, cost, and delivery (QCD evaluation). In addition to this, a cost adjustment rate of 1-5% will be added according to cost fluctuations⁴⁹.

This modification is based on the policy of the Medium-Term Defense Buildup Program (FY 2019-2023), which stated that "MOD/SDF will review the contracting system with the aim of creating

⁴⁵ Ministry of Defense, "Basic Policy on Strengthening the Infrastructure for the Development and Production of Equipment" (October 12, 2023), 7, https://www.mod.go.jp/atla/soubiseisaku/basicpolicy/basicpolicy_r051012.pdf.

⁴⁶ Ibid.

⁴⁷ Ministry of Defense, "About 'the Joint Promotion Meeting for the Use of Startups in the Defense Industry'" (May 16, 2023),

https://www.mod.go.jp/atla/pinup/pinup050616_01.pdf.

⁴⁸ Acquisition, Technology and Logistics Agency, "Fund for Strengthening Infrastructure for Equipment Manufacturing (Special Loan Program)", <https://www.mod.go.jp/atla/kimishikaoran/index.html>.

⁴⁹ Ministry of Defense, "Nation's Defense and Budget," 35.

a competitive environment, including the introduction of the enterprise evaluation system that assesses how much a contractor company tries to contribute to the strengthening of the defense industry.” After the Program was published, an official review of the pricing rule was undertaken and materialized based on discussions by experts in business administration at the Contract Regulation Study Group, an expert panel of the ATLA. The following three points can be cited as the features of this system.

First, the pricing rule for defense contracting through the conventional cost accounting method is a system with little incentive for contractors to reduce costs. The advantage of the cost accounting method, which adds profit by multiplying the cost by a certain profit margin because there is no market price, is standardization that eliminates arbitrary pricing. On the other hand, if the cost increases, it leads to higher profits, making it difficult for corporate efforts such as quality improvement and cost reduction to be reflected in prices. To improve this deficiency, the introduction of this new system, aims to associate profit ratios more clearly with corporate efforts, including cost reductions, by linking QCD evaluation, which will be based on the elaborated checklists set forth by the ATLA, with the profit ratios⁵⁰. Furthermore, the QCD checklists are intended to evaluate not only the outcome of the corporate goals but also the processes for inching closer to these goals.

⁵⁰ Director for Cost Accounting, Acquisition, Technology and Logistics Agency, "Summary of Items Approved by the Minister of Defense Based on the Provisions of Article 70 of the Instruction on the Standards for Calculation of Estimating Equipment Prices and Article 23 of the Implementation Guidelines of the Instruction in Accordance with the Revision of the Instruction," https://www.mod.go.jp/atla/souhon/pdf/yotei_santei_kijun_r05.pdf.

⁵¹ The standard profit margin of 7.2% under the existing rule was originally set only for profitable firms in the industry on which the profit margin is

This is seen as an attempt to provide incentives for companies to improve their competitiveness in the Japanese defense industry, where competition among companies is rare, by evaluating the company's process for improving its QCD, which had not been taken into consideration in the conventional cost accounting method.

Second, on the other hand, under the new pricing mechanism, it is possible for companies to be granted a lower profit rate than before. In other words, by changing the profit margin to a range of 5-10% based on the QCD evaluation from the conventional profit margin of around 8%, it can be assumed that contracts for companies with poor QCD evaluations may result in lower profits than in the past in some cases⁵¹. In this regard, at the Contract Regulation Study Group held in 2022, one of the committee members asked whether the use of the profit margin as an incentive meant that the MOD would not hesitate to let unwilling companies withdraw, to which a MOD official responded that it would like to contribute to industrial restructuring and suggested that the pricing system may play a role as a sieve in the selection of effective companies. In addition, a committee member pointed out that the range of the said profits only indicated the upper and lower limits, and that in terms of the overall distribution, there would be almost no companies that could take the upper limit⁵². Given these points, the new pricing rule, while expanding the room for

based, but it is said that the standard profit margin drops by about 2% when loss-making firms are included, and the lower limit of 5% may have been set based on such a merkmal of the actual situation. "Transcript of the 36th Meeting of the Contract Regulations Study Group" (July 11, 2019), https://www.mod.go.jp/j/approach/agenda/meeting/keiyaku_seido/pdf/giji_36.pdf.

⁵² "Transcript of the 37th Meeting of the Contract Regulations Study Group" (March 28, 2022), https://www.mod.go.jp/j/approach/agenda/meeting/keiyaku_seido/pdf/giji_37.pdf.

increasing the profit margin in response to the requests of companies, does not incorporate corporate requests as they are, but also takes into consideration the possibility of concluding contracts that reduce the profit margin depending on the performance of the companies.

Third, apart from the profit margin, which fluctuates in the range of 5-10%, a "cost adjustment ratio" of 1-5% is now taken into account. This is based on the reality that the longer the contract period, the more susceptible it is to cost increases due to inflation and exchange rate fluctuations. This is expected to prevent subcontractors such as aircraft parts suppliers mentioned above from having their real profits squeezed by their primes and ultimately withdrawing from the business.

In addition, as a joint effort by the METI and the MOD, an "Expert Panel for the Formulation of Guidelines for the Promotion of Fair Subcontracting Transactions of Business Operators Related to Defense Equipment" was launched in June 2023. As mentioned earlier, defense equipment prices are calculated relatively strictly as "direct material costs" including subcontracted manufacturing parts and materials according to the MOD's "cost accounting method". Thus, on the books, subcontractors' profits will not be significantly squeezed. However, as mentioned above, the time lag between the time of the estimate before the contract and the time of the order between the prime and the subcontractors may put pressure on the subcontractor's profit. Moreover, since the pricing is based on the prime's estimate, it is impossible for the MOD to fully grasp the actual status of such subcontracting relations. On the other hand, although the METI is in charge of

cross-sectional guidance over industries, there is a possibility that efforts to ensure appropriate subcontracting transactions may be insufficient since there are no unified guidelines for fair subcontracting transactions for the defense industry. In light of these points, the two ministries will jointly study measures for appropriating subcontracting transactions by surveying questionnaires and interviews with companies, while listening to the opinions of experts and industry associations⁵³.

(4) Efforts to Promote Exports

Several initiatives to promote exports of defense equipment, which have so far achieved little, have also been proposed. First, the Defense Production Base Reinforcement Act stipulates the establishment of a fund for the government to cover the cost of modifying specifications (e.g., downgrading) for those who had been manufactured for the SDF, for security reasons, when exporting them. This is based on the viewpoint that if companies are required to change specifications for security reasons and the costs are borne by the companies, the government should bear such costs because buck-passing such costs to companies will affect their competitiveness. 40 billion yen has been appropriated in the FY2023 budget to the fund (the same amount is also appropriated in the FY2024 estimate request.)

In addition, as part of an initiative to promote exports at the supplier level by participating in the U.S. defense industry supply chains, a "mentoring program" has been launched as a project commissioned by the MOD, in which Japanese companies wishing to participate in the program can obtain advice from U.S. defense companies⁵⁴.

⁵³ Acquisition, Technology and Logistics Agency, "Expert Panel for the Formulation of Guidelines for the Promotion of Fair Subcontracting Transactions of Businesses Related to Defense Equipment." <https://www.mod.go.jp/atla/soubiseisakukaigishiryo>

[u_kentoukai.html](https://www.kentoukai.html); Ministry of Economy, Trade and Industry, <https://www.meti.go.jp/press/2023/06/20230628001/20230628001.html>.

⁵⁴ Acquisition, Technology and Logistics Agency

Furthermore, after the formulation of the Three Principles on Overseas Transfer of Defense Equipment and Technology, there has been a move to review the "Implementation Guidelines," which had been a bottleneck in actually issuing export licenses for defense transactions. At the ruling party working-level consultations between the Liberal Democratic Party (LDP) and the Komeito Party, discussions are underway on exports of internationally jointly developed products to third countries, and lethal equipment among or beyond those falling under the so-called "five categories" such as warning and surveillance, and the relaxation of export licenses for licensed production products⁵⁵.

2. What are the Remaining Challenges?

To what extent are these efforts making a change in the issues that have been contributing to the decline of Japan's defense industry as described above, particularly the long-standing keynote policies, and bringing about changes in the structure of the industry? And to what extent can they be responsive to the immediate causes of the recent crisis?

(1) Are Reforms in Improvement-oriented R&D Methods Sufficient?

First, the problems of improvement-oriented R&D based on import substitution policy are well recognized in the government initiatives listed above. To address this, several methods have been proposed to develop defense equipment that can meet rapidly changing defense requirements through active interactions

Official Twitter (February 27, 2023), https://twitter.com/atla_kouhou_jp/status/1630098188467310592.

⁵⁵ "Government Can Export Even Those Equipped with Lethal Weapons: Views at the Conference between the LDP and Komeito," *Sankei Shimbun* (August 23, 2023), <https://www.sankei.com/article/20230823-24P72NYWINIO3ADMZPT4H7U5MQ/>. The

between the development side/companies and the operators of the SDF. Also, given the current international situation in which advances in civilian technology are driving the development of defense equipment, mechanisms are also being organized to incorporate innovative civilian technologies into the defense sector. The number of applications and adoptions by universities to the Innovative Science and Technology Initiatives for Security, which started in 2015, has begun to increase after nine years of continuous implementation,⁵⁶ and the concerns about reputational risk by being involved in defense research are also gradually easing.

Furthermore, the "Defense Technology Guidelines" released by the ATLA are unique in that they identify key technological fields with an eye to how they are applied for future warfare. This is in contrast to the previous Defense Strategy and Medium- and Long-Term Technology Estimates, which were notorious for their vague technology development policies and descriptions focusing specifically on technological aspects. It is expected that the new Guidelines will play an important role in fostering a common understanding of technology development among the development side, operational side, and companies.

However, as is clear from the fact that the MOD's budget request materials state that proposals from companies and other entities that contribute to early equipment development are "being welcomed at any time," there is no formulated procedure within which proposals for the development of new technologies and concepts can be made. Although the

partial revision was made in December 2023, and the reviewing process for the remaining issues is further undertaken in 2024.

<https://www.cas.go.jp/jp/gaiyou/jimu/bouei.html>.

⁵⁶ "Applications for Military Applied Research Doubles After Academic Council Modifies Stance," *Sankei Shimbun* (August 26, 2023), <https://www.sankei.com/article/20230826-JRDJLXFANVIPBGRDXSK3LVSACE/>.

Innovative Science and Technology Initiatives also has a flexible soliciting framework for emerging technology research, it is not designed to solicit proposals for new concepts from scratch.

In addition, there are not enough human networks and specialized organizations to identify companies and research institutes that can propose and develop new technologies. The MOD is to launch a new research institute for innovation, and this is to be established through "scrap and build of the ATLA's R&D-related organizations" (National Defense Strategy). In other On the other hand, the MOD has announced a policy of actively utilizing outside personnel, modeled after DARPA in the United States, but it is unclear whether appropriate outside personnel are currently available in the private sector. What is needed is not simply private-sector personnel with defense-related R&D experience, but "hybrid" personnel who are familiar with both the defense needs of the government and the technological strengths of companies and research institutes. In Japan, there is no pool of such personnel in the society because of the absence of those who can move between the government and the private sector, and there may be limitations to transplanting a DARPA-type research organization and concept as it is.

In the new initiatives by the government, the problems of improvement-oriented R&D based on its conventional import substitution policy are clearly recognized, and there is an awareness to respond to changing defense requirements and increasingly sophisticated technologies. On the other hand, it is undeniable that concrete solutions have not necessarily kept pace with the recognition, and the situation is still in a state of groping. A realistic

words, it is by default that a new R&D organization will be created by revamping or abolishing the current four internal research organizations of the ALTA: the Land, Naval, Air, and Next-Generation Systems Research Centers. The concern with this is the ability to reach out to the new companies and personnel mentioned above. If the organization is to be established within the MOD, its researchers will basically be proper scientists and engineers, and it will not develop technological human resources that have access to private-sector contacts. solution method that matches Japan's current situation is required.

(2) Have Import Substitution Policies Changed?: Sustainment of the Existing Industrial Structure and Lost Momentum for Industrial Restructuring

The government's measures to strengthen the defense industry, particularly the Defense Production Base Reinforcement Act of 2023, are focused on maintaining the existing industrial structure⁵⁷.

Admittedly, financial support for business succession in the event of a defense company's withdrawal may have the effect of temporarily mitigating the impact. In particular, the approach of allocating the necessary funds not in the contract for procuring defense equipment but in a separate financial support (subsidy) should be positively evaluated. This is because, at least under the provisions of the Law, it is expected that the financial needs of contractors can be met earlier at the pre-production stage, compared to when payment is made as compensation for the manufacture of equipment. However, the solicitation

⁵⁷ This issue was also raised in a public hearing by a witness, Heigo Sato (Professor of Takushoku University), before the House of Councilors Committee on Foreign Affairs and Defense (May 30, 2023),

<https://www.webtv.sangiin.go.jp/webtv/sp/detail.php?sid=7490>. However, with economic security risks on the rise, support for diversification of supply sources of materials and other resources is timely and important.

guidelines and their contractual clauses for financial support published in October 2023 seem to offset the advantages of this approach. According to these provisions, financial support is to be provided "after confirming the completion of delivery" of defense equipment tied to the efforts about which such financial support is concerned including business succession and measures for supply chain resiliency⁵⁸. This may even delay the timing of payment in some cases compared to the case of paying necessary expenses within the contract for manufacturing defense equipment. It would be necessary to review the way of implementation so that financial support can be provided at least prior to the delivery of equipment. In addition, such financial support does not necessarily solve the very reasons (profitability, weak competitiveness, etc.) that led defense companies in the supply chains to exit the business. Therefore, this alone may not be able to halt the further decline of the defense industry in the mid- to long-term.

State ownership of the manufacturing facilities of companies going out of business is also unprofitable and, in some cases, obsolete equipment will be maintained with state funds. This entails the possibility of losing prospects for alternative outsourcing companies or investments in new facilities as well as the incentive to invest in more efficient manufacturing technologies. On this point, in the Basic Policy, it seems that if the manufacturing equipment is outdated, the government may build or acquire new equipment on behalf of the outsourcing company⁵⁹. However, in such cases, it may be more efficient for the government to bear the necessary costs in the formation of

a new supply chain led by prime companies, rather than for the government to directly intervene and purchase the manufacturing facilities. This is because there is a risk that the government's intervention in private-sector transactions will undermine the proactive efforts of both primes and suppliers in integrating the whole system of equipment.

Exceptions to this trend of preserving the existing industrial structure include financial support for more efficient manufacturing techniques through the introduction of innovative manufacturing technologies and the establishment of a more meritorious setting of profit margin through QCD evaluations. These measures, if they are properly operationalized, have the potential to have an effect beyond the maintenance of the existing industrial structure. This is because new manufacturing processes will encourage the entry of new suppliers into the market, and efficient manufacturing techniques can be expected to improve profitability. In addition, high profits for companies that achieve high QCD ratings are expected to spur focused investment within the company. On the other hand, companies that continuously suffer from low-profit margins may withdraw from the market.

Business succession within the existing supply chains and the ownership of manufacturing facilities by the government may be necessary to solve short-term problems. However, from a more medium- to long-term perspective, emphasis should be placed on improving the efficiency and profitability of the supply chains through the above-mentioned support for manufacturing techniques and QCD evaluation.

At the same time, efforts focused on

⁵⁸ Acquisition, Technology and Logistics Agency, "Guidelines for Application for Approval of the Plan for Securing Stable Production of Defense Equipment" (October 1, 2023), https://www.mod.go.jp/atla/hourei/hourei_dpb/02_boshuyoko_antei.pdf; Acquisition, Technology and Logistics Agency, "Clauses of the Contract for

Services Concerning Specific Initiatives Related to the Plan for Securing Stable Production of Equipment," https://www.mod.go.jp/atla/hourei/hourei_dpb/04_keiyakujoko_tokutei.pdf.

⁵⁹ Acquisition, Technology and Logistics Agency, "Basic Policy", 17.

maintaining the existing defense industry have resulted in a lack of momentum in advocating measures for industrial restructuring and corporate integration. As mentioned above, the main cause of the defense industry's decline over the past decade has been the rapid increase in imported equipment due to changes in defense requirements, while a less competitive industrial structure was preserved due to the absence of progress in corporate restructuring. Given this situation, the various initiatives described above will not prevent further business products. This is because there is no economic rationale for maintaining business in a field where procurement volumes will not increase.

However, if there is no conscious effort by both the government and industry to set forth priorities, it may result in the preservation of inefficient businesses with no growth in demand for a certain period of time through financial support. As will be discussed in Chapters 2 and beyond, while countries are pursuing selective autonomy, a policy of maintaining existing industries without a focused strategy that is inconsistent with trends in procurement could lead to a dispersion of resources and a decline in the industry as a whole. Through the significant increase in the defense budget, more resources have been invested in the defense industry. Yet it will be difficult to use this as leverage to strengthen the defense industry if it becomes an extensive investment that does

withdrawal, particularly the withdrawal of manufacturers of land equipment. While the trend of extensive budget allocation to air and maritime equipment and missiles remains unchanged, land equipment, for example, for which the scale of procurement will not expand, will gradually be replaced by foreign products. If this is the case, even if the Basic Policy is to acquire domestically produced products or to provide financial support for them, there is no way to prevent products and sectors with declining demand from eventually being replaced by imported not entail priorities.

Therefore, for products that have a certain level of domestic demand, it is necessary to combine it with exports and international businesses to consolidate demand and make the scale of operations sustainable. In addition, in order to prevent excessive "segregation" among manufacturing companies, efforts should be made to reduce the types of equipment by consolidating and integrating functions across equipment from a wholistic approach, rather than developing and acquiring a wide range of equipment in an a priori manner⁶⁰. Ultimately, it will be important to put forth incentives to encourage companies to consolidate and integrate voluntarily, leveraging the increased demand resulting from the increased defense budget. And this motivation must be based on the economic rationale of the companies, and not merely a declarative policy⁶¹ by the government.

⁶⁰ As a related measure, the Medium-Term Defense Buildup Program (FY 2019-2023) states that "the MOD/SDF will also develop equipment with multiple functional variants, optimize and standardize specifications of equipment, jointly procure equipment commonly used across SDF services, reduce types of aircraft, suspend the use of equipment whose importance has decreased, and review or discontinue projects of low cost-effectiveness". As a part of this effort, the 2022 Defense Buildup Program sets forth the abolition of GSDF attack helicopters and observation helicopters by replacing them with unmanned vehicles.

⁶¹ In this regard, the Basic Policy states, "To make the defense industry internationally competitive, it is important to build a defense industry led by companies that are highly dependent on defense demand. It should be noted that the way individual companies are organized is solely up to their own business decisions. It is necessary to continue to exchange views among the public and private sectors on what measures will be effective to make the defense industry competitive, including cooperation among companies and integration of divisions while keeping coordination with the policies of other ministries and agencies" (9) while it does not specify what kind of policy tools should be employed.

(3) Are the Efforts to Promote Overseas Exports Sufficient?

In order to stabilize the operations of defense companies, in addition to consolidating demand through corporate integration, it will be essential to expand its scale through exports and international businesses. To this end, exports of internationally competitive products are necessary, but the financial support currently proposed for equipment specification changes will not fundamentally strengthen this (although it and Technology. In particular, if exports of jointly developed products to third countries are permitted, this will contribute to the maintenance of a sustainable industrial base through increased demand, including for next-generation fighters. In reviewing the guidelines, it is necessary to redefine defense equipment exports not only in terms of their significance for security cooperation but also from the perspective of strengthening the competitiveness of the defense industry.

(4) Has the Direct Trigger of the Crisis Been Addressed?

Among the three issues listed above, the increase in imports and sluggish exports are symptoms of the industrial structure based on three key policies (import substitution policy, improvement-oriented R&D, and export restraint policy). Success or failure in addressing these underlying factors in medium- to long-term measures will be the key to solving these problems.

On the other hand, the fragile profit structure of defense procurement can be addressed in the shorter term because it is caused by the discrepancy between the dynamics of the international economy and the government-set price calculation method for defense equipment. Therefore, the ongoing exit of suppliers, especially aircraft parts manufacturers, is likely to be

is expected to raise the level of price competitiveness).

On the other hand, participation in the U.S. defense supply chains would be a realistic option given the current business scale in which the Japanese defense industry is operating, but it is not an initiative that directly encourages the export of finished products. In this regard, the most important issue going forward will be the revision of the Implementation Guidelines for the Three Principles on Overseas Transfer of Defense Equipment

halted to a certain degree by taking into account cost volatility in the new pricing rule introduced by the MOD. This is because it will help ensure appropriate profits for suppliers, who are most affected by the price squeeze between cost-cutting demands from primes and the soaring prices of imported parts and materials.

It should also be commended that the Study Group for Fair Subcontracting Transactions was established, which involves not only the MOD but also the METI. While they do not have a complete picture of the contractual reality in the defense supply chains, it will be essential to ascertain the actual situation through interviews with the industry and individual companies. It is fair to say that the policies introduced by the government are addressing these issues that can be reasonably dealt with in the short term.

In this Chapter, we have analyzed the challenges facing Japan's defense industry along with its historical background and examined what initiatives would be effective in this context. In Chapter 2 and beyond, we will examine the cases of defense industrial policies in other countries to gain perspectives that cannot be introduced by analyzing Japan's case alone, and make recommendations to address the remaining issues mentioned above