Significance of Home-Produced Weapons for the Japanese Defense Industry: An Analysis of Corporate Discourses on Developing the Japanese-Made FSX in the 1980s–1990s

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Abstract:
This paper attempts to clarify the trends and background of decision-making in the defense industry during the development of FSX[1]. The FSX (later named F-2) is a support fighter for the Air Self-Defense Force that was developed between the 1980s and 1990s. It was initially intended to be developed domestically, but due to conflicting diplomatic issues, it was ultimately developed jointly by Japan and the United States. In this paper, I have examined the role played by Japan's defense industry in the FSX development process and their principles of action by analyzing the discourse of defense industry personnel related to FSX in a comprehensive manner. The analysis revealed that the defense industry not only played a role as practitioners, but also exercised influence on Japanese national security policy as proponents of domestic development, and that the defense industry's advocacy of domestic development was based on a sense of pride and responsibility as defense industry companies responsible for national defense, as well as pride in their own technology. Therefore, the defense industry is not just a subcontractor, but an important actor that makes claims about the realm of Japan's security based on its own principles. It concluded that their principles are rooted in the identity of the defense industry and are not necessarily based solely on military or economic rationality.

Keywords: *JSDF, defense industry, FSX (F-2), development of military technology, Japanese postwar history, media history*

1. Introduction

After World War II, Japan's Constitution provided for the renunciation of war and the non-

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1 FSX denotes a new-generation fighter developed and produced in Japan.

preservation of armed forces. In their place, the Japanese Self-Defense Forces (JSDF) were established strictly for the defense of the nation. They are composed of various organizations, mainly the Ground, Maritime, and Air Self-Defense Forces. As a result, various limitations have been placed on the Self-Defense Forces' development of military technology. Military technology development and weapons production in Japan is the work of the Acquisition, Technology and Logistics Agency. Nevertheless, it is the defense industry, made up of many private companies, which is practically responsible for the production, maintenance, and upkeep of the equipment and weapons necessary for the Self-Defense Forces' activities. For example, there are 1,100 fighter aircraft-related companies, 1,300 tank-related companies, and 8,300 naval ship-related companies involved in Japan's defense. However, both the Self-Defense Forces and the defense industry are veiled in secrecy from the eyes of the general public due to their highly classified nature.

In recent years, humanities and sociology research on the Self-Defense Forces has been on the rise, mainly in Japan. In these studies, the history of defense policy, civil-military relations between the Self-Defense Forces and the general public, and the gender structure within the Self-Defense Forces are analyzed. It has been pointed out that research on the Self-Defense Forces has not progressed in the humanities and sociology of postwar Japan for reasons such as the taboo against the Self-Defense Forces in the pacifist postwar society and the difficulties in studying the Self-Defense Forces due to the mutual distrust between scholars and the Self-Defense Forces (Shimizu 2021). However, this situation is dissipating due to the growing importance of Self-Defense Force research. Still, little sociological research has been done on military technology development, especially in the defense industry until now.

However, in a highly industrialized society like Japan, the military cannot be described without mentioning advanced technology. In such a society, weapons are developed and produced using advanced technology, and national security is pursued. In other words, technology is the central component of the military. Therefore, in order to understand the current relationship between the military and society, it is necessary to clarify how military technological development has been positioned and maintained in the society. Moreover, since Japan's military technology development is mainly carried out by the defense industry, it is necessary to study the actual status of the defense industry in order to clarify the social positioning of military technology development.

Based on the research situation described above, this paper elucidates the actual status of military technology development by the defense industry. This analysis will focus not only on issues related to economic gain and political rationality but also on the ideology that has driven the development of military technology. Prior research has clarified the reality of institutions and policies related to military technology development, but the link between military technology development and ideology and beliefs has been overlooked. This paper will focus on how the defense industry has promoted the development of military technology in the face of Japanese society's negative view of the military under Japan's postwar pacifism. Consequently, this paper reveals the reality of postwar Japan's military technology development.

Specifically, this paper aims to analyze the movements and decision-making process of the Japanese defense industry in relation to the FSX development issue that occurred in Japan in the 1980s. The FSX development issue refers to a series of events surrounding the development of the Self-Defense Forces' next-generation support fighter (FSX), which became a political issue between Japan and the United States in the 1980s. In the "Medium-term Defense Force Development Plan" formulated in 1985, the FSX was designated by Cabinet decision to be procured and deployed as the

successor to the F-1 support fighter. At the time, the Ministry of Defense was considering three options for the development of the FSX: domestic development, conversion of an existing fighter aircraft, or purchase of a foreign fighter. After that, they were approached by the U.S. about "joint development" and changed their term from domestic development policy to "development." As a result, the FSX was to be developed jointly by Japan and the United States. Behind this development was the issue of trade and technological friction between the two countries. Therefore, a conflict occurred between the Japanese defense industry, which insisted on domestic production, and the U.S. side, which urged the purchase of a U.S. fighter. At this time, the Japanese defense industry's insistence on domestic production was not only a matter of economics, but also of ideology and beliefs, such as their confidence in their domestic technology and their pride as engineers. This paper will clarify the trends of the defense industry in the FSX development issue in the 1980s by analyzing the discourse of related materials, such as the writings of those involved, magazines published by the Japan Defense Industry Association, newspapers, and military magazines, while also focusing on the issues of the ideologies and beliefs of those involved.

2. Research Background and Literature Review

The series of events related to the FSX's development, as well as the dynamics of the Japan-U.S. relationship in this context, have been the subject of extensive analysis, particularly within the disciplines of political science, international relations, and economics. For example, Yamagata analyzed the policy-making process about the FSX issue based on the assumption of the Japan-U.S. security system (Yamagata 2002). In addition, Shinji analyzed the tensions between Japan and the U.S. during the FSX aircraft selection process (Shinji 1999). This study demonstrates that the U.S. sought to preserve its technological superiority and to curb Japan's pursuit of military autonomy and emergence as a major power through the exercise of technological hegemony. However, these studies analyze the Japanese and U.S. governments as the main actors, and the existence of other actors is neglected. Certainly, the matter of how to develop a fighter for a nation's military organization is fundamentally a matter to be handled by the government and the relevant ministries. Furthermore, in Japan's case, as long as defense capabilities are being developed under the Japan-U.S. security framework, this could also become a diplomatic issue. However, various actors other than the government and relevant ministries were involved in the process from the planning to the development and production of the FSX. Therefore, in order to clarify the actual situation surrounding the FSX issue, it is necessary to focus on these various actors as well.

There is a study that includes the defense industry as an actor in the FSX issue (Fukunaga 2016). This study examines how military aircraft development and manufacturing have been carried out in postwar Japan from the perspective of the national innovation system. Fukunaga clarifies the role played by defense industry companies in the development and manufacture of the F-2 fighter jet, but his analysis is limited to the role of companies in the development and manufacturing process. He does not touch on the involvement of the defense industry in the preliminary stages of development, such as the decision on procurement methods and the selection of aircraft models. However, in actuality, the defense industry had been actively lobbying the government and the Defense Agency even before the development and manufacturing stages of the fighter. Therefore, in order to understand the role of the defense industry in the FSX issue, it is necessary to analyze the defense industry not only as practitioners involved in development and manufacturing, but also as political actors involved

in security policy.

Furthermore, it is problematic that the FSX issue has been framed predominantly as a political and economic matter, with insufficient attention paid to its cultural dimensions. For example, some American researchers argue that unique cultural factors, such as Japan's desire for technological independence, caused diplomatic friction between Japan and the United States over FSX (Samuels 1994). Therefore, in order to examine the trends and role of the defense industry in the FSX issue, it is necessary to focus on the cultural background and ideas and beliefs that led them to strongly promote domestic development. However, in Japanese humanities and sociology, not only the FSX issue but also research on the Self-Defense Forces and modern military affairs in general has been relatively neglected until recently. Ryo Shimizu points out that military sociology, as seen in Europe and the United States, was hardly developed in postwar Japan (Shimizu 2021). This study attributes this to the taboo surrounding the Self-Defense Forces in the pacifist postwar society and the mutual distrust between scholars and the Self-Defense Forces, which made research on the Self-Defense Forces difficult. Therefore, with the exception of a few studies, the Self-Defense Forces and Japanese military affairs have not been a major theme in the humanities and social sciences. However, in recent years, there have been a growing number of sociological studies that overcome these difficulties and approach the Self-Defense Forces and the military, but the issue of the "technology" that supports the security system is still unresolved.

On the other hand, the history of military technology development in postwar Japan has been examined in the context of security policy history and military research history (Chijiwa 2021; Otake 1983; Sugiyama 2017). In these historical studies of defense policy and military research, the main subjects of analysis have been actors such as the government and the scientific community (primarily universities). However, the defense industry, which is responsible for actual development and manufacturing, has been largely marginalized in these historical studies and has rarely been the focus of attention. This can be attributed to the fact that, in the field of security policy history, scholarly attention has primarily focused on the decision-making processes and logic of the government, while in the history of military research, the central concern has been how the normative stance of scientists, namely, the refusal to engage in military research, was constructed and maintained. However, in order to grasp the entire process of military technology development and elucidate how Japan's postwar security system was established, it is necessary to focus not only on the government and the scientific community, but also on the defense industry, which is responsible for the production process, as a major actor.

Furthermore, it is also important to examine the actual state of the defense industry in order to consider the relationship between the military and society. This is because the JSDF does not have its own arsenal and outsources the development and manufacture of weapons to private companies. So, Japan's defense industry can be considered a hub that connects the military sphere and general society through technology. Clarifying the actual state of the defense industry will lead to a deeper understanding of how the military and civilian sectors are connected, and what kind of relationship exists between them.

Based on the above, this paper attempts to resolve the issues of previous studies by focusing on the defense industry as its research subject. By analyzing the trends and underlying ideas and beliefs of the defense industry as a major actor, it will be possible to examine the FSX issue from a more multifaceted perspective and clarify the role played by the defense industry. Furthermore, this case study will serve as a basis for elucidating the actual state of the defense industry in postwar Japan and

examining the relationship between the military and society.

3. Case, Methodology, and Sources

This paper analyzed the discourse on the FSX development program during the 1980s and 1990s. In particular, this study collected and analyzed the discourse of Japanese defense industry companies involved in its development (Mitsubishi Heavy Industries (MHI), Kawasaki Heavy Industries (KHI), Fuji Heavy Industries (FHI), and Ishikawajima-Harima Heavy Industries (IHHI)). FSX development refers to a series of processes to develop and produce a successor to the F-1 support fighter, which was nearing the end of its service life. In 1982, the National Defense Council in Japan approved the Mid-term Project Estimate in 1981 (Showa 56-nendo Chuki Gyomu Mitsumori), which included the FSX plan. Several methods were considered in developing a successor aircraft, including "domestic development," "purchase of a foreign aircraft," and "conversion of the current aircraft." The factions supporting each method were at odds with each other and could not agree on a policy. Therefore, in 1986, the Japanese government changed the term "domestic development" to "development" and began to consider the possibility of joint development with the United States. As a result, it was decided that the FSX project would proceed under a joint Japan-U.S. framework, and under this project, the F-16 fighter jet, which had already been developed by the U.S. company General Dynamics Corporation (GD), would be modified and produced. The completed next-generation support fighter, named the F-2, made its first flight in 1995 and continues to this day.

MHI played a central role as the Japanese company in developing the FSX. MHI is the number one supplier to the Ministry of Defense in the field of weapons manufacturing and is a representative company of the defense industry in Japan. They were also a major presence in the discussions surrounding the development of FSX. They strongly insisted that the FSX development program should be researched and carried out in Japan from the beginning of its planning. However, their insistence was rejected due to multiple factors, including issues related to Japan's domestic technological capabilities, economics, and the political dynamics between Japan and the U.S. in the context of U.S.-Japan trade friction. Nevertheless, even under the Japan-U.S. joint development system, MHI, as the lead contractor, occupied a leading position in its research and development. In addition, domestic companies such as KHI, FHI, and IHHI also cooperated in development and production in their respective areas of responsibility.

In this way, during the process of FSX development, all the basic options were discussed when considering modern Japanese weapons' development. Therefore, an analysis of the debate surrounding the development of the FSX will shed light on how the development of postwar Japanese military technology was envisaged. In addition, the positions of not only the government and the military (Self Defense Forces) but also defense industry companies, which are the actual technology developers, are clarified in this discussion. They insisted on developing a domestically produced fighter. Therefore, I propose that by taking up this case study, we will be able to clarify how the significance of developing weapons domestically has been considered and insisted upon by the companies that are the bearers of the technology. For these reasons, the discourse of defense industry firms regarding the FSX development plan was selected for analysis in this paper.

In order to clarify the trends and ideas of the defense industry during the FSX development process, this study collected and analyzed the discourse of defense industry personnel, using newspaper articles related to the FSX development and the writings of defense industry personnel as

historical materials.[2] The reason for selecting newspaper articles as the main historical source is that, in the FSX issue, when the defense industry expressed its opinions as an industry, it often did so through the press, including newspapers. They expressed their position and thoughts through press conferences and interviews with the media. Therefore, it is thought that collecting and analyzing their discourse in newspaper reports would be the best way to clarify the trends and ideas of the defense industry regarding the FSX issue. Specifically, I focused on collected articles related to FSX from the Asahi Shimbun,[3] extracted statements made by defense industry officials, and then conducted discourse analysis. In addition, some people involved in the defense industry have published autobiographies and other works in later years. This paper also refers to these works by people involved in the defense industry and collects their discourses.

This paper begins with a historical review of the defense industry's discourse on FSX development. Through this work, the historical evolution of the defense industry's involvement in the development of the FSX was identified. The period of analysis is set from 1982 to 1995, because 1982 was the year when the FSX program was planned, and 1995 was the year when the F-2 fighter plane developed under the FSX program was completed and made its first flight. By setting the period of analysis from 1982 to 1995, it is possible to analyze how the defense industry was involved in the development of the nation's new weapons from the planning stage to the actual completion of development. In addition, this paper conducted a qualitative discourse analysis of each discourse based on the following issues: 1) Why did the Japanese defense industry place so much emphasis on developing the FSX with domestically produced technology? 2) What did the Japanese defense industry think about its own military technology? 3) What were their thoughts on purchasing their country's weapons from foreign countries or developing them jointly with foreign countries? Through consideration of these issues, this paper clarifies the trends and decision-making process of the defense industry in the FSX development issue.

4. Discussion

(1) 1984 to 1988: The Development Method Review Stage

The "Medium-term Estimate for Fiscal Year 1981" was approved at a National Defense Council meeting in July 1982. This included the plan to "maintain the next-generation support fighter." In response to this decision, the Defense Agency began considering procurement methods for the next-generation support fighter. In 1984, a review of the strength of the F-1, which was the current aircraft at the time, was carried out, and it was decided that its service life could be extended, so the possibility

2 For basic information about the historical background of FSX development and the aircraft, this paper referred to newspaper articles, (Matsumiya et al. 1998) and (Mitsubishi Jukogyo Kabushikigaisha Shashi Hensanshitsu 2014). In addition, this paper referenced details on the political background, including the negotiation process between Japan and the United States (Kurihara 2007a; 2007b).

3 Among national newspapers, we refer to the Asahi Shimbun because we believe that it was particularly active in verifying and reporting on the FSX issue. The Asahi Shimbun is not only involved in newspaper reporting but also publishes a series of articles analyzing the FSX issue in its in-house journal, "Choken Shitsu Ho," published by the Asahi Shimbun Research Institute, which was later published as a book. From this stance, it can be inferred that there was a high level of interest in FSX issues, which is why it was selected as the main source material for this study. However, in order to verify the overall tone of national media coverage, we also collected articles from the Yomiuri Shimbun and Mainichi Shimbun for the survey.

of developing a next-generation support fighter jet domestically, which had been pointed out as lacking in development time, began to be seriously considered. When the Defense Agency began to seriously consider development and production methods, including domestic production, defense industry companies such as MHI and KHI began to actively lobby the government and the Defense Agency to realize domestic development.

The Japan Space Industry Association, one of Japan's defense industry organizations, held a New Year's party on January 9, 1985. In his speech at the party, Chairman Soichiro Matsunaga (President of MHI) appealed to the Diet members in attendance, saying, "I hope you will make it possible for us to independently develop the next-generation support fighter" (Asahi Shimbun 1985). In the article reporting this statement, it is pointed out that "the expansion of defense demand creates facilities and personnel, and this, in turn, creates demand for the next thing" (Asahi Shimbun 1985), and it is suggested that defense industry companies are seeking domestic development to maintain their expanded defense divisions, but why did those involved in the defense industry actually want domestic development? Yoshio Sasaki, Managing Director of MHI, said of the FSX development, "If we were to license production or import, we would lose our technological accumulation, and the Japanese aircraft industry would be ruined" (Asahi Shimbun 1984). In another article, a person reported to be a source in the business world had argued that if it is made in Japan, the technology accumulated through F-1 development can be inherited and developed (Yomiuri Shimbun 1985). From these comments, it can be inferred that those involved in the defense industry saw the domestic development of the FSX as an opportunity to pass on and develop aircraft development technology within the industry. At the time, 10 years had already passed since the development of the F-1 fighter jet developed by MHI, and no new fighter jets had been developed during that time. Therefore, the Japanese defense industry (particularly the aircraft development sector) was facing the problem of a break in the succession of skills and the loss of opportunities to train engineers. So, it is thought that they saw the development of FSX as a great opportunity to pass on and develop the technology of the domestic aviation sector and that they made an appeal to the government and the Defense Agency as the spearhead of the domestic development faction to make this a reality.

On the other hand, Masao Kanamori, who was the vice-chairman of the Japan Federation of Economic Organizations and the chairman of the Defense Production Committee, said, "Weapons are only truly high-performance and cost-effective if we can make, operate and repair them ourselves" (Asahi Shimbun 1986), and he expressed his intention to strongly urge the government to make them domestically. This statement shows that the defense industry placed importance on self-defense from a technological perspective. In fact, much of the Self-Defense Forces' equipment was either imported from overseas or manufactured under license from products developed in the U.S. and other countries, and Kanamori saw this as a problem. The defense industry, including Kanamori, took the position of emphasizing self-defense, and argued that in order for Japan to achieve its own national security without relying on other countries, it was necessary to carry out all stages of technological development in Japan.

Then, around the summer of 1985, the defense industry became more active. In June, MHI and KHI each announced plans to develop a new fighter jet. With regard to the Mitsubishi proposal, a conceptual drawing was published in the June 1985 issue of *Koku Journal* (Aviation Journal), and an appeal was made to the general public as well as the Defense Agency that domestic development was possible. In addition, in October 1985, both MHI and KHI submitted a research report to the Defense Agency Headquarters regarding the development of fighter jets, arguing that it is fully possible to

develop them using domestic technology. In December 1986, the FSX Joint Research Group was formed by five companies: MHI, KHI, FHI, IHHI, and Mitsubishi Electric. They advocated the development and production of the FSX in Japan by the defense industry as a whole. For example, when interviewed, the team leader of the FSX Civil Joint Research Team, Itsuro Masuda, said, "We have sufficient technological capabilities for independent development. Our company is a leading company in this field. If we are asked to build a fighter like this, we are ready to respond immediately," and "We will show you that we can fly an FSX that is as high-performance and cheap as the U.S. and Soviet models in four or five years" (Asahi Shimbun 1987a). He asserted the development of a domestic product with strong confidence in his company's technology.

However, around October 1986, American aircraft manufacturers also began to actively promote their products. The U.S. Department of Defense also asked Japan to purchase American aircraft, citing the increasingly serious trade friction between Japan and the U.S. at the time. In response to this offensive from the U.S., on December 26, 1986, Yuko Kurihara, the then Director General of the Defense Agency, stated that he would like to revise the existing policy on selecting aircraft models by changing the term "domestic development" to "development" and including joint development with foreign countries as an item for consideration. In response to this change in policy, MHI President and Japan Aerospace Industry Association Chairman Yotaro Iida said at a party held after the Japan Aerospace Industry Association general meeting, "This issue should be decided based purely on defense technology considerations" (Asahi Shimbun 1987b), and he reiterated his belief that Japan should promote independent development and curb the proposal to purchase American aircraft, which had suddenly become stronger against the backdrop of Japan-U.S. economic friction. Iida also expressed his confidence and ability in self-development, saying, "We can respond most accurately and efficiently to the performance requirements of the Defense Agency" (Asahi Shimbun 1987b). Kosaku Inaba, the chairman of the Japan Weapons Manufacturers' Association, also criticized the U.S. for linking economic and diplomatic issues with military technology development, saying, "This (the FSX issue) should not be discussed together with trade friction. Our country has considerable development capabilities. We need to maintain and improve our technology, especially given the future of the aircraft industry" (Asahi Shimbun 1987c). He said that development methods should be decided from a purely technical perspective. From their comments, it is clear that they were confident that Japan's technological capabilities at the time were of a high enough standard to enable independent development.

However, in June 1987, a basic policy was decided to jointly develop with the U.S. The head of MHI, which was the secretariat of the FSX Joint Research Group, said, "The opposition from the U.S. side to domestic, independent development is greater than we expected. As a manufacturer, we would like to see the Japanese side at least maintain the line that they can design as they wish" (Asahi Shimbun 1987d), and they made a major concession from their previous position of insisting on "domestic development." After the path of Japan's unique domestic development was cut off, the defense industry's argument changed from a demand for domestic production to a demand for Japan to take the initiative in joint development.

For example, between August 13 and September 3, 1987, the FSX Civil Joint Research Group dispatched a delegation of twenty technical experts to the United States to assess which aircraft, the F-16 or the F-18, would be more suitable as a base model for modification in the FSX program. Based on their investigation, the Group concluded that the F-18 was the preferable option, as it offered greater potential for new development. From the perspective of the defense industry, which sought to

ensure leadership in the joint development process and retain design autonomy, the F-18, allowing for more substantial modification and integration of advanced technologies, represented the most attractive choice. However, this position taken by the defense industry directly conflicted with the views of the Defense Agency, particularly the Air Staff Office, led by the Chief of Staff of the Air Self-Defense Force (ASDF). The Air Staff, especially ASDF pilots, strongly opposed the F-18, citing concerns about its inferior performance. As a result, the Chief of Staff's view prevailed, and the F-16 was selected as the base model for development.

This episode illustrates a clash between two distinct logics: the defense industry's emphasis on technological innovation and development flexibility, and the ASDF's military-operational rationale, grounded in strategic performance and deployment considerations.

From the above, it is clear that the defense industry had been strongly advocating the "promotion of domestic production of the FSX" based on its own position and principles, even at stages prior to specific development and manufacturing, such as reviewing procurement methods and selecting aircraft types. Their logic, however, sometimes conflicted with the military logic of the Defense Agency and the Self-Defense Forces. In other words, the defense industry was a major political force that made claims and demands based on the logic of engineers or private companies regarding issues related to national security policy, such as how to procure combat aircraft for the country. In this sense, they were not merely subcontractors who manufactured products based on orders from the Defense Agency, their client.

(2) 1988 to 1989: Political Issue Stage

On June 2, 1988, the basic conditions for joint development between Japan and the United States were agreed upon at a meeting between Defense Agency Director Tsutomu Kawara and Secretary of Defense Frank Carlucci. The following day, the FSX joint development between Japan and the United States was agreed upon at the Japan-U.S. Defense Summit. However, some American lawmakers vehemently opposed the agreement on the joint development of FSX between Japan and the United States. Many of them were members of parliament with the aviation and defense industries as their main supporters, and they were concerned about protecting their country's industries and the leakage of technical information to Japan.[4] The FSX Japan-U.S. joint development project became a political issue in the U.S. due to the mistrust of Japan among the American people, stemming from the trade friction between the two countries that was emerging in industrial fields such as automobiles and semiconductors at the time. Members of Congress opposed to the joint development of FSX between Japan and the United States used various means to put pressure on the two countries to cancel the joint development.

At this time, Japan's defense industry also became a target of attack. One example of this is the "Libya scandal" reported in the United States. The allegations against Libya were leaked, alleging that MHI may have been involved in the construction of chemical weapons factories in Libya. MHI immediately denied the allegations, saying that they were "entirely unfounded and difficult to understand" (Asahi Shimbun 1989a).[5] MHI believed that the opposition was a deliberate attack aimed

4 Among the basic conditions agreed upon between Japan and the U.S. were that the Defense Agency would be responsible for project management and that all technical information obtained through the development of the FSX would belong to the Defense Agency.

5 It is extremely unusual for MHI to hold a press conference to deny such claims, and it was also reported that the

at stopping the joint development of the FSX (Asahi Shimbun 1989a) and intended to destroy the joint development of the FSX. Since military technology development is carried out by the state, the decision on how to develop it is not just a technical issue, but also a political and diplomatic issue. Therefore, the defense industry also became caught up in the political dynamics.

While the FSX joint development proposal was becoming a political issue in the U.S., negotiations for its development were being carried out at the working level. The Japanese defense industry took on the role of negotiating with the American companies regarding the division of labor in joint development. In November 1988, the Defense Agency appointed MHI as the main contractor for the Japanese side, KHI and FHI as the cooperating companies for the Japanese side, and GD as the cooperating company for the American side. MHI, which became the main contractor, was responsible for negotiating the development share ratio with GD, the American contractor. Negotiations over the division of labor between the Japanese side, which wanted to ensure that the development was led by Japan as much as possible and secure the division of labor ratio, and the American side, which wanted to secure its own profits and also seek the provision of advanced Japanese technology, were difficult. In particular, negotiations over the division of responsibility for the development of the main wings of the aircraft, which were to be developed using the cutting-edge technology of Japanese companies, were extremely difficult. MHI's Executive Vice President Takaaki Yamada took a firm stance, saying, "We absolutely cannot hand over all the wings" (Asahi Shimbun 1988).

An episode that symbolizes the thoughts of both Japan and the U.S. at this time was reported in the Asahi Shimbun on February 10, 1989:

> Mitsubishi Heavy Industries' Executive Vice President Takaaki Yamada invited General Dynamics' Executive Vice President Meller, who was visiting Japan, to a restaurant in Akasaka, Tokyo. In front of the pottery dishes containing kaiseki cuisine, Vice President Yamada told the story of how potters from the Hokuriku region once traveled to Kyushu for days to learn the superior techniques of Imari ware and eventually brought them to fruition as Kutani ware. "Now, Japan and the United States are just a short flight away. For the development of the main wings of the FSX, wouldn't it be better if the engineers from GD came to Japan to learn composite material technology?" Before Mr. Yamada, the vice president, had finished speaking, Mr. Meller, the vice president, answered. "Because GD is Imari" (Asahi Shimbun 1989b).

From this episode, we can see that both the Japanese and Americans had deep confidence in their own technological capabilities, and that this is why negotiations between the two sides were difficult. Of course, ensuring the division of labor and obtaining the latest technological information are things that lead to corporate profits for private companies, so it is only natural that they will not make concessions to the other party in order to pursue their own profits. However, behind this tough stance was also the pride of the defense industry companies of both Japan and the United States as leading powers in industrial and technological development.

On the other hand, since military technology development is ultimately a matter of national security policy, the final decision is left to the government, and it is also true that the defense industry did not have the right to make that decision. At first, Japan's defense industry strongly requested that

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fact that the comments were made in the president's name showed the company's confusion (Yomiuri Shimbun 1989).

FSX be developed domestically, but in the end, the Japanese government made repeated concessions to the U.S., and it was decided that the work would be divided 6:4 between Japan and the U.S. This concession meant a reduction in the profits of Japan's defense industry. In response to this, an editorial writer for the Asahi Shimbun newspaper asked a defense industry executive, "Why are you keeping quiet (towards the Japanese government)?" The defense industry executive explained, "We expressed our opinions to the Defense Agency each time. However, our stance is to work for the country and to silently obey if the country's policies change. Of course, there were many things on our minds" (Asahi Shimbun 1989c). From his comments, it can be understood that even though they may have had their own opinions from the standpoint of the defense industry, they basically had a principle of action that prioritized national policy over their own arguments.

In other words, the defense industry was pursuing its own interests and competing for control of technological development within the scope of its own business activities, but it was doing so in a way that did not conflict with the wishes of the country that was placing the orders.

(3) 1990 to 1995: Prototype Development Stage

In June 1989, when the joint development of the FSX was approved by the U.S. Congress, work began in earnest on the development of a prototype. At this stage, defense industry companies such as MHI began to play a central role in the practical aspects of prototype development, including expanding their own facilities and forming development teams. For example, MHI expanded its aerospace-related manufacturing facilities to two locations on July 1, 1989, in anticipation of the development of the FSX. Furthermore, on March 30, 1990, the FSET (Fighter Support Engineering Team) was established at the Ooe Plant of MHI. When FSET was established, a total of 104 engineers were invited to join the project, including 72 from MHI, 11 from KHI, 11 from FHI, and 10 from GD, the American partner company.[6] Then, with up to 330 engineers, FSET carried out the basic design of the FSX aircraft, which was based on modifying the F-16.

At the time when the aircraft was actually being designed and developed, the Japanese people involved in the FSX joint development project spoke of the significance of the project. For example, Kunikazu Kanda, who was the team leader for FSET, said the following about what he gained from developing FSX:

> It is also important that the technology can be passed on to the next generation, with young people taking part in the development. At first, the independent development of the FSX by Japan, which was considered to be a strong possibility, would have been relatively easy, like building a new two-story building on a vacant lot. However, in order to put a second floor on top of a single-story F-16, we need to know the proper foundation technology. In that sense, I think we were able to learn something similar to independent development this time (Asahi Shimbun 1992).

Kanda emphasized that this development was an opportunity to pass on the technology to the younger generation.[7] Furthermore, in the FSX development diary he wrote later, he stated,

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6 Information on the number of participants was taken from Kanda (2018).

7 The desire to pass on such technology to the next generation was shared not only by engineers in the field but also by senior management. Yasuhiro Takao, advisor to Mitsubishi Heavy Industries, said that he had experience in

"Throughout the development of FSX, as the team leader, I was always thinking about how to pass on the development technology of the FSX to the next fighter development team" (Kanda 2018). From this account, we can see that Kanda, who was an engineer on the ground, was already looking ahead to the development of the next fighter jet even while the FSX was being developed, and that the joint development of the FSX was seen as a place to pass on development technology.

In addition, Takashi Nishioka, Deputy Director of the Nagoya Aircraft Works of MHI, said, "The great appeal of the aircraft industry is that it allows you to acquire the most advanced technology of the times, and in particular, development for the Defense Agency greatly improves technological capabilities. Without the FSX, Japan's aircraft technology would be left behind even on a global scale. Although the technology of the FSX cannot be immediately applied to the development of commercial aircraft, without such technology, it will be difficult for Japan to take an equal position with Western manufacturers in international joint development projects in the 21st century" (Asahi Shimbun 1990a). Unlike Kanda, who was only concerned with the technical succession in the development of fighter jets, Nishioka also evaluated the development of the FSX as an opportunity for technical succession across the entire Japanese aviation industry, transcending the boundaries between the military and civilian sectors.

In other words, for those involved in Japan's defense industry, the development of the FSX was not just about making a profit for their own company, but was also seen as an opportunity to contribute to the development of Japan's entire aviation industry in the future, both military and civilian, by passing on technology and accumulating know-how through research and development of cutting-edge technology. So why did the engineers involved in the development of FSX at the time place such an emphasis on "technological succession"?

Firstly, the sense of crisis in the Japanese aviation industry can be pointed out as a factor. For example, Kousaku Inaba, the chairman of the Japan Aerospace Industry Association, said, "We have not yet reached the point where we can do business with complete products such as airplanes and space rockets. The overall level of technology in Japanese industry is high. However, unfortunately, in the field of aerospace [...]" admitting the low level of Japan's aerospace industry at the time (Asahi Shimbun 1990b). At the time, the Japanese aircraft industry had a smaller market than other industries, accounting for only 0.19% of the gross national product (GNP). In terms of international market share, Japan was also lagging behind Western companies that mass-produced both military and civilian aircraft, and the various aircraft manufacturers were unable to develop new aircraft domestically. If they couldn't get the chance to develop a new aircraft, they wouldn't have the opportunity to improve their technical standards or learn about cutting-edge technology. They would also lose the opportunity to pass on knowledge and know-how about aircraft development from one generation to the next. Therefore, it is thought that the aim of the defense industry companies in developing the FSX, which was a valuable opportunity to develop a new aircraft, was to pass on the technology of the entire Japanese aviation industry and to promote the aerospace industry.

Secondly, it can be pointed out that the engineers on the front line had a sense of responsibility as part of the defense industry. Kanda, who was the team leader of FSET, explained why defense industry companies must not let the technology die out as follows:

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integrating individual technologies that had already been realized into a single aircraft system during the development of the FSX, and that he wanted to pass on that experience to future generations (Takao 1993).

> The fighter development technology that Mitsubishi Heavy Industries has acquired was built up in the process of developing fighter jets for the Air Self-Defense Force using national funds, and no one else in Japan has acquired it. Therefore, Mitsubishi Heavy Industries cannot be allowed to abandon this on its own, but rather, it must improve so as not to fall behind the progress of science and technology in the world. To do this, it is necessary to further improve the skills that have been passed down before the person who inherited the skills retires, and to create opportunities for the next generation to inherit them (Kanda 2018).

The background to this statement was the history of the development of fighter aircraft developed by MHI, such as the T-2 and F-1, from the 1960s to the 1970s. In fact, there was a gap of more than 10 years between the development of the F-1 and the development of the FSX, and the transfer of technology had become an urgent issue. He referred to the responsibility of defense industry companies to pass on and improve the technology, as fighter jet development technology is something that has been built with taxpayer money. Defense technology development in Japan is carried out using government funds, with orders placed by the Defense Agency. Therefore, the technology developed there is not the sole property of the relevant company but can be said to be technology for the country and its citizens. Therefore, it was thought that if the succession and development of defense technology were to be discontinued for the sake of the company alone, it would be considered that the defense industry was not fulfilling its responsibilities. That is why the engineers on the front line sought a regular opportunity to develop a new fighter. Kanda also used the example of the Ise Shrine's regular renewal of the shrine buildings[8] to argue for the necessity of regular development projects and said that if there were an opportunity to develop new fighter jets for the Air Self-Defense Force once every ten years or so, it would be possible to pass on the technology.

As it has been seen, the FSX joint development project was evaluated not only for its objective of developing and producing a new fighter but also for its significance in "passing on technology" to future generations. The reason why the people involved in the development of the defense industry attached importance to the inheritance of technology through the development of FSX was due to both the pragmatic desire to promote the domestic aerospace industry as an industry and the sense of responsibility as a defense industry to not let the technology cultivated with taxpayers' money for the country die out.

5. Conclusion

This paper aimed to examine the role and principles of action of the defense industry in the development of military technology in post-war Japan by clarifying the trends and background of decision-making in the defense industry during the development of the FSX. This study revealed that, during the FSX development process, the defense industry played a variety of practical roles, including not only development and mass production, but also research and investigation for development methods and model selection, as well as practical negotiations in joint development.

8 The term "Shikinen Sengu" refers to the construction of a new shrine building at regular intervals and the transfer of the object of worship from the old building to the new one. The Ise Shrine's Grand Ceremony of the Transfer of the Sacred Object, which is held once every 20 years, is famous. As the construction of the new shrine is carried out on a regular basis, it also serves as a place for the transmission of traditional architectural techniques.

Furthermore, it has become clear that the defense industry has not only played a practical role, but has also acted as an advocate for promoting domestic development, making demands from its own perspective to the government and the Defense Agency on issues related to national security policy, such as the selection of development methods. And behind the defense industry's push for domestic production lies a sense of pride and responsibility as companies responsible for national defense, as well as pride in their own technologies. What is particularly important is that the defense industry acted not only as practitioners but also as advocates of domestic production, making demands on the Defense Agency and the government. Behind such behavior lay not only the profit-seeking behavior typical of commercial enterprises but also the pride and sense of responsibility inherent in defense industry companies as an industry responsible for national security.

At first glance, the reason why the defense industry companies insisted so strongly on domestic development during the FSX development process may seem to be the pursuit of their own profits. Indeed, it was estimated that the FSX development market would be worth 1 trillion yen at the start, and if they were appointed as a contracted company, it was expected that they would make a considerable profit. Furthermore, if the FSX were to be developed and produced entirely in Japan, the amount of work that could be ordered would increase. Therefore, it was natural for private companies, whose main objective is to make a profit, to demand domestic development. However, the reason given by those involved in the defense industry for promoting domestic development was not necessarily just the pursuit of their own company's profits.[9] They argued that their position in the defense industry and their strong pride in their own technology were the reasons for promoting domestic development. In particular, they emphasized the need to pass on aviation technology as a reason for requesting the domestic development of the FSX. The reason they thought it necessary to regularly develop new fighter jets and pass on aircraft development technology from one generation to the next within the company was that they thought that if the passing on of technology were to be cut off, Japan's defense industry would no longer be able to develop a fighter on its own and would not be able to fulfill its responsibilities as a defense industry.

In addition, the basis for their claim that domestic development was fully possible was also their pride in the level of their own cutting-edge technology. At the time, Japan was lagging behind Europe and the United States in the aerospace industry. Still, they had a track record of creating world-leading products in other consumer technologies, such as automobiles and home appliances, and possessed cutting-edge technology in some areas related to fighter jet development. As a result, they had strong confidence in their own company's and country's technological capabilities. In this way, they argued that it was possible to develop a new domestic fighter jet because of their confidence in their technological capabilities, and they tried to prove the high level of their technology by actually creating the "Hinomaru FSX."

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9 As Fukunaga and Yamada point out, "the domestic development of an aircraft constitutes a crucial opportunity for aircraft manufacturers to build their essential organizational capabilities" (Fukunaga and Yamada 2011). From the perspective of corporate sustainability, the inheritance of technology through domestic development can thus be considered an economically rational decision that aligns with the profit-seeking nature of private enterprises. However, it is also important to note that Kanda and others emphasized the importance of technological succession not merely for business continuity, but as part of the broader national responsibility borne by defense industry companies engaged in supporting national defense. From this perspective, one can discern an underlying ideology of autonomous defense—namely, the belief that a nation's defense should be sustained by its own technological capabilities—indicating that a logic distinct from pure economic self-interest was simultaneously at work.

In other words, the defense industry has been an important actor with a sense of self-awareness in postwar Japan's military technology development as the mainstay of Japan's defense, making claims and demands based on its own logic and ideals. Their principles and ideals include elements rooted in the identity of the defense industry, such as a sense of responsibility and pride in technology, and it can be considered that they did not necessarily pursue profit as their sole objective. However, the logic of the defense industry sometimes conflicted with the political and military logic of the government, the Defense Agency, and the Self-Defense Forces. In selecting the base model for the modification and development, and in determining the ratio of development to be undertaken by Japan and the United States, the defense industry made its own claims and demands based on the logic of private companies and engineers. However, as confirmed in this paper, these claims sometimes conflicted with the political logic of the Japanese and U.S. governments and the military logic of the Defense Agency and the Self-Defense Forces. Of course, the final decision-making authority regarding defense policy and military strategy rested with the government and the Defense Agency, so there were cases where their arguments were not accepted. However, one of the factors behind the consideration of domestic development and Japan-led joint development during the series of events surrounding the FSX issue was the strong demand from the defense industry for domestically produced fighters.

In this sense, this paper concludes that the defense industry should not be regarded merely as a practitioner that develops and manufactures weapons under the direction of the government and the Defense Agency, but also as a political actor that participates in decision-making processes related to Japan's national security.

A future task of this study is to elucidate the extent to which the defense industry's advocacy for domestic production actually influenced governmental and Defense Agency decision-making, and how politicians and senior officials within the JSDF interpreted or responded to the industry's claims.[10] The purpose of this paper was to analyze the role and principles of action of the defense industry in the FSX issue through an examination of its discourse. Consequently, it offered limited discussion of the industry's political influence or its relationships with politicians and senior JSDF officials. However, it can be assumed that the government and the Defense Agency closely monitored the activities of the defense industry and were influenced by them to a certain extent. Therefore, by analyzing the nature of the relationships between politicians, the Defense Agency, and the defense industry, particularly how political and bureaucratic actors perceived and responded to the defense industry's statements and intentions, it will be possible to assess the political influence of the defense industry empirically and to further elucidate its role not merely as a practitioner, but as an actor capable of exercising influence

10 For example, Keigo Ouchi, a member of the House of Representatives from the Democratic Socialist Party, who questioned the Defense Agency during a Budget Committee session in the House of Representatives regarding the extension of the F-1 fighter's service life—a measure that in effect supported the possibility of domestic FSX development—later recalled that immediately after notifying the relevant ministries of his question in advance, he received a phone call from a labor union leader in the aerospace sector urging caution. He also received similar requests from senior party officials of the Democratic Socialist Party, whose electoral base was in Nagoya, where Mitsubishi Heavy Industries' aircraft production facilities were located. Reflecting on this, he stated, "I adjusted my question accordingly" (Otsuki and Honda 1991).

This episode suggests that the defense industry was regarded by both politicians and Defense Agency or Self-Defense Forces personnel as a stakeholder that could not be ignored. Going forward, it will be important to empirically examine the influence of the defense industry on political actors, the Defense Agency, and senior uniformed officers, using additional materials such as oral histories conducted by the Defense Agency.

over national security policy. This remains a task for future research.

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