
FMS制度と日本の防衛技術・産業基盤の 健全な発展に向けて

Toward sound development of the FMS System and Japan's
Defense Technology & Industrial Base

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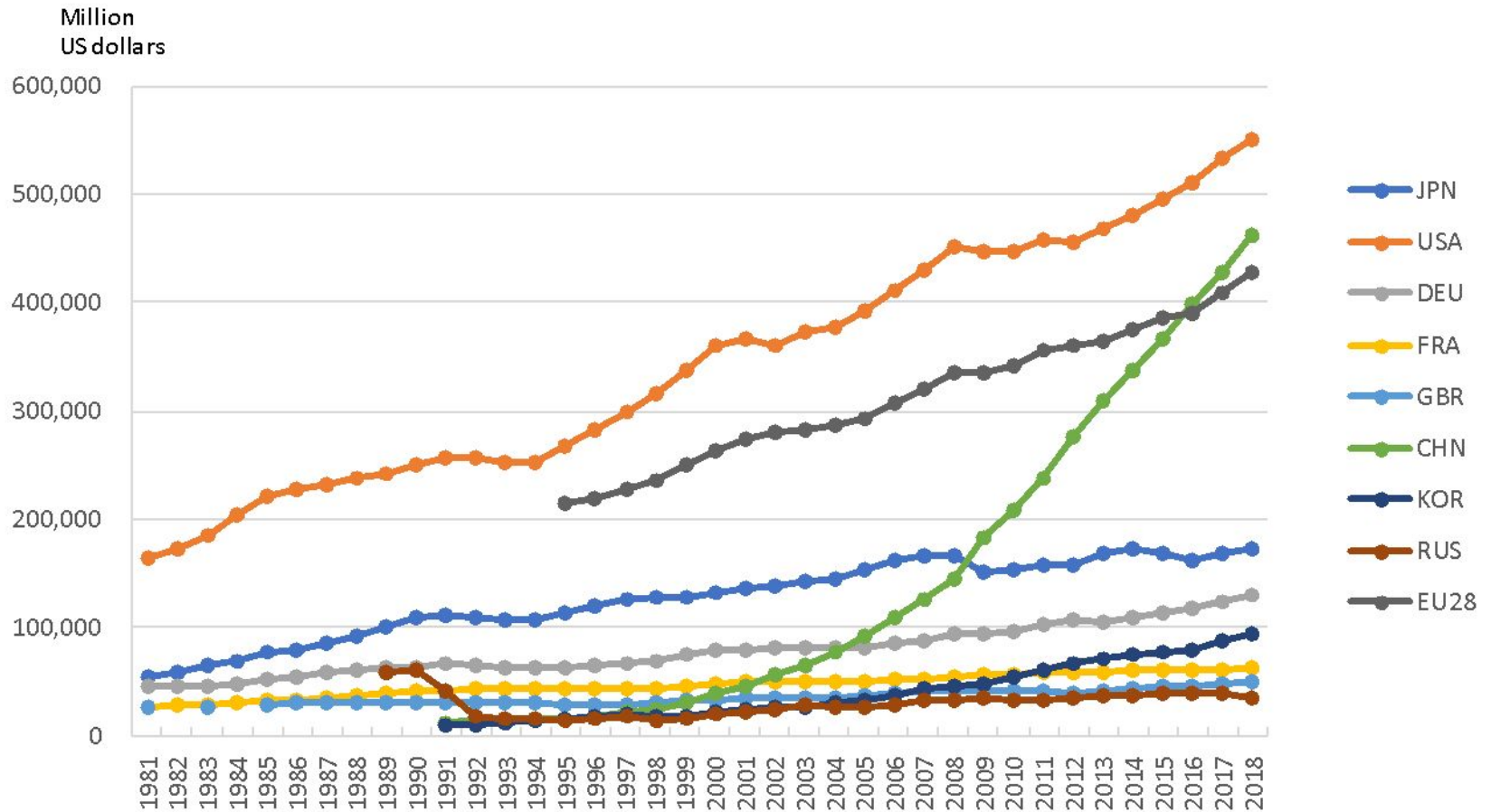
Changes in the Security Environment surrounding FMS (1)

The emergence of threats posed by new weapons in neighboring countries suggests that the role of FMS may expand in the future. However, rapid progress in some advanced technologies (Emerging Technologies) will occur and is expected to be difficult to follow.

- The superiority of US and Japanese defense technology over neighboring countries may soon be temporarily lost
- In addition to hypersonic weapons (HGV, HCM) [1], the diversification of ballistic missile warheads and emergence of unmanned platforms pose a significant risk to conventional defense measures.
- The technologies of neighboring countries (especially China) in “new areas” such as space, cyber, and electromagnetic spectrum (stealth technology, electronic warfare, wireless communication) are improving. But development in Japan and the United States has been relatively slow.
- Economic indicators also show that China's investment in science and technology is approaching that of the United States as shown in (Fig. 1).

FMS is a quick and effective way for Japan to secure the means to counter new threats. It is expected to continue to be effective in highly mature technical fields such as unmanned weapons procurement. However, in the acquisition of equipment that takes longer to develop, such as Directed Energy Weapons, its speed is of no advantage and therefore it cannot play a sufficient role.

Figure 1. R & D expenditures in each country



Created based on "Gross domestic spending on R&D," OECD Data
<https://data.oecd.org/rd/gross-domestic-spending-on-r-d.htm>

Changes in the security environment surrounding FMS (2)

Yamamoto [2] discusses the growing "mismatch" in security alliances and economic dependence between the United States, China, and third countries. As the inconsistency between the two increases, he pointed out that there is a risk of instability in the security system between countries.

The total trade volume (imports + exports) (Fig. 2) between the two countries is an appropriate indicator of the strength of the economic relationship.

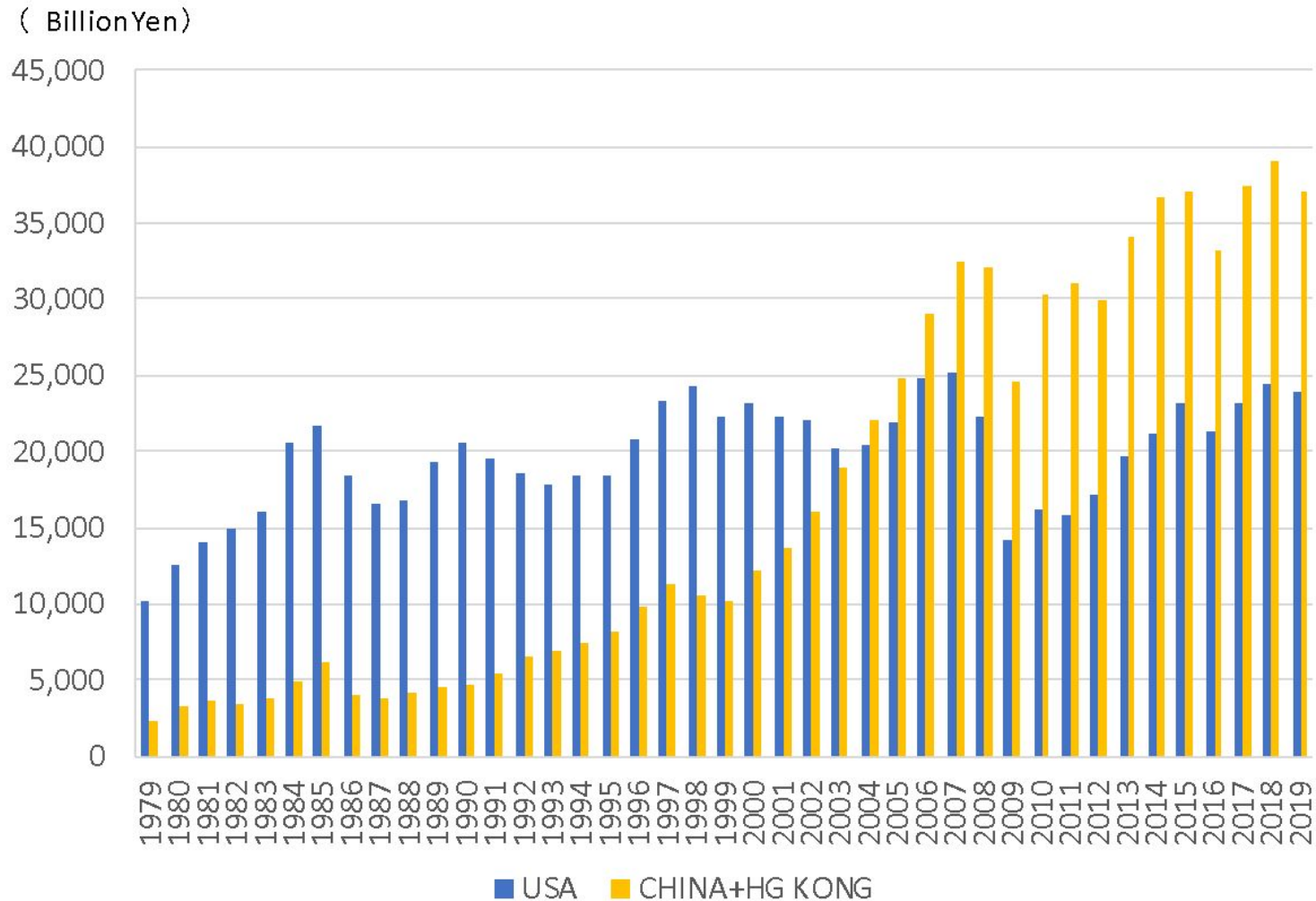
The current status of "mismatch" is, the total amount of trade between Japan and the United States has not recovered to the level before 2007 even after it decreased sharply after the recession that followed the financial crisis in 2008.

Conversely, total trade between Japan and China exceeded that of Japan and the United States in 2004. In 2020, this trade difference is on track to double, partly due to the impact disparity of COVID-19 between the United States and China.

FMS strengthens Japan-US security relations and helps to alleviate-"mismatch" between Japan-US and Japan-China security and economic relations. (FMS procurement costs account for about 5% of the total).

The rise in price levels due to China's economic development and the development of the digital economy post-corona may correct the economic scale and spatial distance factors in the gravity model [3].

Figure 2 Total trade with the United States and China (export + import)



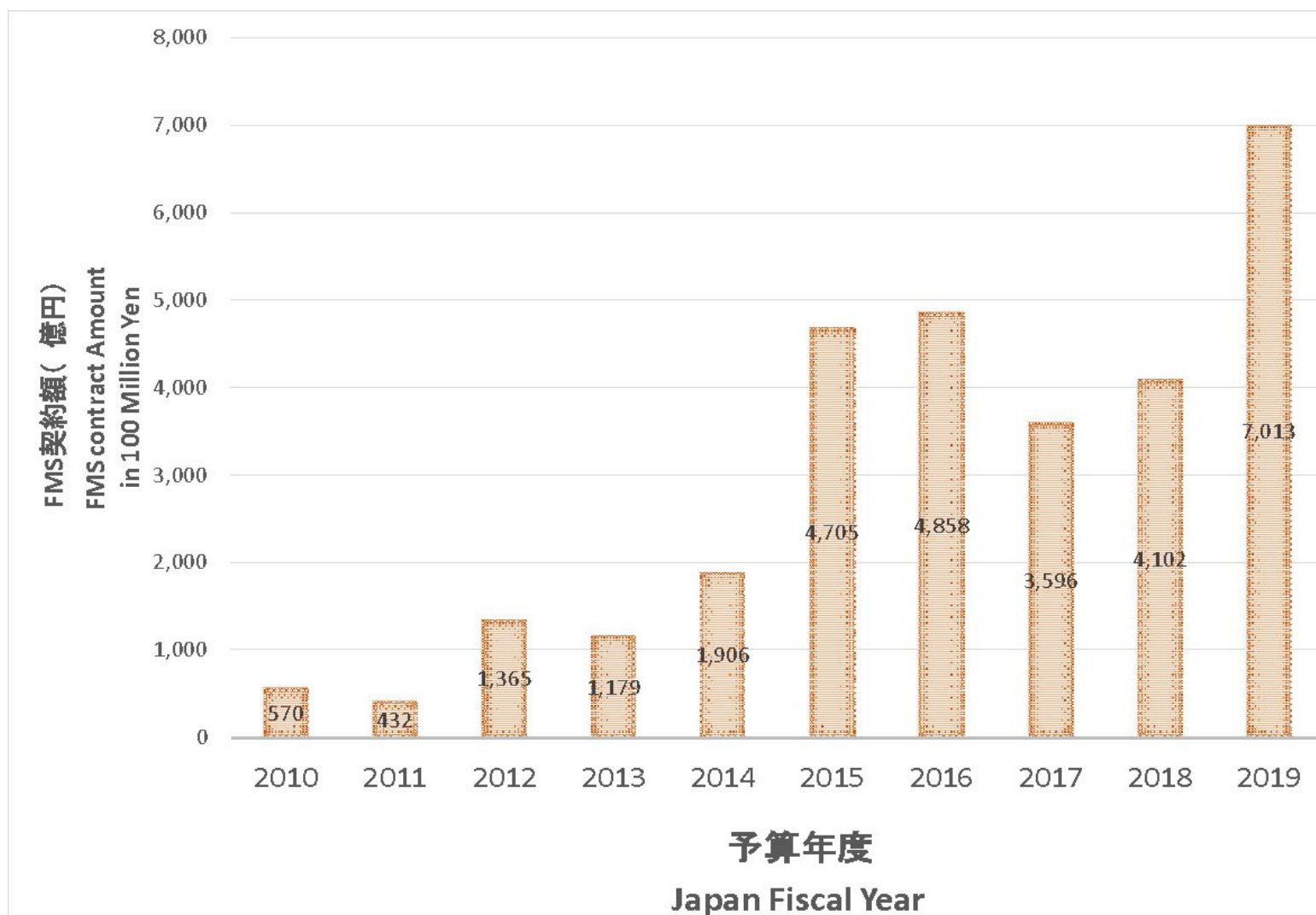
Created based on "Trade Statistics of Japan," Ministry of Finance of Japan
<https://www.customs.go.jp/toukei/suii/html/time.htm>

Trends in the use of the FMS system in Japan

Reflecting the harsh security environment surrounding Japan, the procurement of defense equipment via FMS has increased sharply (Fig. 3).

- The contract-based budget for FMS (including supplementary budget) from JFY2012 to JFY2014 was between 100 billion yen and 200 billion yen.
- Increases after FY2015, JFY2015-JFY2018 400 billion yen~500 billion yen
- JFY2019 the budget increased to 701.2 billion yen, but the impact of the Aegis Ashore program cancellation has not been evaluated.
- Projects that increased FMS procurement costs
 - Osprey (V-22)
 - Aegis Ashore (cancelled in 2020)
 - Aegis system for escort vessels
 - Global Hawk (RQ-4)
 - Fighter (F-35A / B)
 - Airborne Early Warning (E-2D)

Figure 3: Changes in FMS contracts



Tange, Aya, "Long-term Contract Law and Burden in Later Years: Diet Debate on Defense Equipment Procurement and Defense-Related Expenses," Legislation and Research (p. 58), 2019. 7, No. 414.

Significance and Challenges of the FMS system in Japan

Significance

- FMS, enables the introduction of the latest equipment and is indispensable for solving common security issues in Japan and the United States.
- FMS accounts for a large amount of US exports, it also helps to strengthen the Japan-US economic relationship and alleviate tension in bilateral relations.

Challenges

- Need to ensure FMS system is beneficial to Japan's defense-industry base and the US. It must also be accountable and cost effective.
 - The increase in FMS costs has raised concerns that Japan's difficult financial situation will put pressure on the number of orders placed with the domestic defense industry.
 - It is the result of the introduction of technology and equipment that the Japanese defense industry does not have as well as standardization of equipment to ensure interoperability between Japan and the US. However, the contribution of the Japanese defense industry to imported equipment is low, and this puts pressure on the value of orders.
- The technical synergies between Japan and the United States may not be demonstrated and technological superiority may be lost.
 - Japan's defense-related technologies (including dual-use technologies) cannot be fully utilized, and it relies mainly on the R & D results of the United States alone.

Solving FMS issues (1)

Expansion of Japan-US joint research and development

- As a preliminary step to FMS, we will increase the number of joint R&D projects between Japan and the US, and have Japanese suppliers play a greater role in the supply chain. We will also improve the efficiency of R&D investment between Japan and the US. Mitigating the negative impacts of FMS on Japan's defense industry base.
- Since 1992, Japan and the United States have carried out 24 joint research and development projects, of which only SM-3 Block IIA has been jointly developed.
- In particular, the participation of Japanese companies in the development, manufacture, and maintenance of common equipment to ensure Japan-U.S. interoperability.
- Regarding maintenance, some defense equipment such as early warning aircraft (E-2D) will be procured from Japanese companies, and this will be expanded to other defense equipment.
- The pace of composition of joint research and development projects is only one case /year, and bottlenecks need to be removed.
 - Sharing technology strategies, including identifying key technologies, to expand the use of dual-use technology
 - Entry into a Japan-US joint project improving the technological and cost international competitiveness of the Japanese defense industry.

To solve FMS issues (2)

Increased cost accountability (1/2)

- Measures of the Ministry of Defense and the Acquisition, Technology and Logistics Agency
 - In a new outline (FY2019), the Ministry of Defense has decided to announce the reasons for selection, including the results of alternative analysis (AoA) in the procedure for selecting important defense equipment. [4]
- In order to strengthen accountability in terms of costs, we formulated the "Life Cycle Cost Management Implementation Guidelines (Measures for Defense No. 3918)" in FY2010, and for the equipment targeted for project management, the life cycle cost (LCC) (Research, development, manufacturing, operation, maintenance and maintenance stage contract amount, personnel cost related to unit maintenance, fuel cost, facility cost, disposal cost, etc.) is controlled.
 - Most FMS procured items such as SM-3Block IIA, Global Hawk, Osprey, F-35A / B, KC-46A, E-2D [5]
 - If the annual estimate / initial standard estimate exceeds 130% and the annual estimate / current standard estimate exceeds 115%, a review of the acquisition strategy plan is required [5]
 - In SM-3 Block IIA, price reduction adjustments and acquisition strategic plans were reviewed due to exceeding the standard for average mass production unit price [5]
- Improvement through initiatives to promote settlement and delivery through SCCM Japan-US talks

To solve FMS issues (3)

Increased cost accountability (2/2)

- US side support in FMS, alternative analysis (AoA) in case preparation stage and cost information provision from US side in LCC management
 - Presentation of cost information including price comparison, confirmation of price validity, and cost breakdown that contributes to cost reduction (In recent Osprey and F-35A FMS cases, a more detailed LOR was presented to the LOA [5]).
 - A high-precision cost estimate at the nominal and current baseline.
 - Proposal of measures that contribute to cost reduction (For example, SM-3 Block IIA considers ordering according to the optimum production quantity of the production line [5])
 - Participation in US cost reduction schemes (i.e. Block Buy Contract on the F-35A)
- Cancellation of large-scale cases (Aegis Ashore) reveals risk management challenges
 - Standardization of program management procedures that will cover both procurement planning stages and FMS procurement management stages.
 - Sharing and dealing with program risk information between Japan and the United States

References

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