Japan's Prospect for International Cooperation in Defense R&D: Opportunities and Obstacles

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The Topical Outline

1) Why limited opportunity and excessive expectation?
2) Major changes in international and domestic environments
3) Defense restructuring in the US, Europe, and Japan
4) Major characteristics of Japan's system of arms production
   (1) Structure (2) Policy (3) Micro-level factors
5) Japan's National/Defense Industrial Interests
6) International R&D: Major Cases
7) Japan's opportunity for international R&D cooperation
8) How to remove five major obstacles?

Limited Opportunity and Excessive Expectation

- Drastic defense budget cuts in the US and major European allies, and incremental cuts in Japan
- Limited relaxation of the Three Principles on Arms Exports (TPAE: 武器輸出三原則等)

1) Japan as a market/arms importer ?: very limited

2) Japan as a R&D partner?: some opportunity

3) Japan as an arms exporter?: very limited

- Why so? How to capture limited opportunity?

Because・・・

1) Japan's Defense Acquisition Budget per annum:
($85Bn/$250Bn; 10%/20% for Import)
TPAE as de facto protection ←→ indigenization policy
license production, coproduction

2) Japanese firms have great capability in and potential for dual-use technology, but lack feedbacks from battlefield experience. These dual-use technologies will be complementary with U.S. and European technological capabilities.

3) Japanese high-end arms are not technologically competitive due to the lack of war-fighting experience. Other arms are not price-competitive because of small production of many products. There is emerging a pattern of unique but isolated evolution of arms and technology: Galapagosnization.

Defense Industrial Restructuring and Reorganization: the US Case

- Perry's "the Last Supper" (1993)
- 50 major firms into 6 primes (in aerospace, 4)
  - a large military sector within a mega-prime (Boeing)
  - a specialized defense firm (Lockheed-Martin)
- The U.S. (Gov. and B) explores global predominance through technological- and price-competitiveness

  →North-American(○), Trans-Atlantic(×), Trans-Pacific(?)

  Defense Industrial Structure
- Japan as a major subcontractor/a major system and subsystem supplier, and as a major consumer of U.S. weapons and military technologies.

Defense Industrial Restructuring and Reorganization: the European Case

- Europe has safeguarded against U.S. offensives
- many firms → national champions → Community-level champions (in aerospace, BAE, EADS, Thales, Finmeccanica)
- Europe has streamlined overlapping and redundant costs through Union-wide R&D collaboration. Will this enable technological competitiveness vis-à-vis the US ?
- Europe needs a major R&D partner and an additional arms market: Japan?

Japan's Structurally Stable Defense Industry: Facing a Crisis

- With defense acquisition budget halved over 20 years, some parts producers have withdrawn from the defense sector.
- More than 10 primes (including, 4 HIs)

  military sales (2%~15%) → intra-firm diversification

– The health of a firm's civil sector supports the military sector.

– Spin-on effects to military sectors→the model for US restructuring

- The performance of Japanese firms has staggered.
- An inherent problem: the lack of war-fighting experience

  (license production, coproduction, limited co-development)
- More and more technology and data have been black-boxed.
- Creeping Galapagosnization and Need for international R&D

Japan's National/Defense Industrial (DI) Interests

- Preserving the current basic DI structure
- Rejecting the U.S.-led trans-Pacific DI, without losing access to U.S. weapons and technologies
- Strengthening the capability of technological innovation through international R&D.
- Options

  1) de facto consolidation by creating a public design corporation ←→ private firms in the production sector

  * 2) individual firms' strategic alliances

  ** 3) Joint venture with domestic and foreign partners

  4) Japanese-led M&A

- With whom to work together for which area of R&D?

International R&D: Major Cases

- US: JSF, Airbus A400M, ARROW, ESSM, Link16/MIDS
- UK: JSF, Eurofighter, Airbus A400M, (Galileo)
- France: Rafale, Airbus A400M, (Galileo), Link16/MIDS
- Germany: Eurofighter, Airbus A400M, (Galileo), Link16/MIDS
- Japan: F2, SM-3, RADAR [U.S.-Japan Limited Co-development], (Boeing 777) (Boeing 787),(Embraer 170/190),(BK117 C-2), MCH-101
- Areas of Projects: (1) air superiority fighter, civil aircraft
  (2) missile (3) satellite (4) electronic system and sensors (5) helicopter
- Characteristics

* US-Europe: 5th generation fighter, major high-end weapon/missile, and system
* Intra-Europe: 4.5th generation fighter, civil aircraft (full), satellite, system
* US-Japan: 4.5th generation fighter, civil aircraft (partial), high-end weapon
* Japan-Europe: helicopter (partial), system

Japan's opportunity for international R&D cooperation

- Japan needs to continue being a junior partner with the U.S. at major system and subsystem levels of high-end weaponry, due to the alliance relationship, excelling US war- fighting experience, and military technology.
- Japan has to explore a co-equal partnership with European governments and firms, where common requirements and technological complementarities exist.

① general-purpose helicopter

② jet trainer/light attack aircraft

③ small/medium-sized UAV

Obstacle ①: What are the Three Principles of Arms Exports (TPAE)?

- TPAE as administrative criteria for applying a directive: gov. policy
- Foreign Exchange and Foreign Trade Control Law (1949) :
  Export is defined as transfer of freight, and export of arms and military technology is "prohibited", not international R&D per se..
- Export Trade Control Directive: possible but permission required.
- (1967): major prohibitions ①the communist bloc
  ②UN resolution ③ the parties of an international conflict
- (1976) Administrative Unified Opinion at the Diet:
  comprehensive no-approval, with possible exceptions
- Diet Resolution (1981) → an established gov. policy
- Setting exceptions: US, and anti-terrorism/pirate operation

The 2011 Relaxation of TPAE and New Opportunity

- Chief Cabinet Secretary Statement (Dec. 2011)
- New exceptions: ①international defense R&D and arms production with allies and friendly nations, and ②peace-keeping operation
- Conditions: Japan's prior consent, after confirming "use for designated purposes only", and "no transfer to the third party".
  - ① if beneficial for Japan's security or;
  - ② if beneficial for international peace and security or;
  - ③ if Japan's contribution to the technology and product concerned is comparably small, and;
  - ④ if the third party has a solid arms export regime.
- A litmus test: US-Japan SM-3 technology to European NATO allies? (defensive purposes, little prospect for further transfer)

Obstacle ②: Intellectual Property

- Necessary legal instruments for int'l R&D: ①+②、② only

① state-state: a master Memorandum of Understanding (MOU)

② B-to-B: a master contract

＊ one with European partners, and another with U.S. partners

- The Level of Japanese Preparedness

1)A Japanese version of the Bayh-Doll Act（産業活力特別措置法）

2) Little practice of technology transfer between Japanese firms in the Gov.-commissioned R&D

3) Little practice of Gov.-to-Academia Collaboration: Need a master contract, especially for "patent pool".

＊ How to balance out sensitive commercial interests involved in engineering services and processing technology beyond drawings and specification: How to manage gives-and-takes

Obstacle ③: Japan's National Defense Standards (NDS)

- NDS has undergone unique historical development.
- Significant parts of NDS were initially set in the 1950s and 1960s, and little modification was made after the early 1980s, except in electronics.
- NDS prevents using even appropriate JIS-based COTS parts and subsystems, consequentially protecting domestic defense suppliers. → Some restructuring and reorganization of the supporting industry is necessary.
- NDS needs to be modified for international R&D.

① more COTS products; a freer hand at subsystem/part levels

② some harmonization with allies' defense standards (NATO standards) and civil industrial standards.

Obstacle ④: Type Certification

- Japan's international R&D projects have to focus on general-purpose, dual-use (non-offensive but military) aircraft that can be exported under TPAR: helicopter, jet trainer/light attack aircraft, small/medium-sized UAVs.
- It is essential to concurrently satisfy Japan's MoD type certification and those of major civil aviation authorities (such as Japan MLIT AA, US FAA and EU EASA).
- This consideration has to be factored at the early stage of a R&D project.

Obstacle ⑤: MoD's conflicting dual roles

- Technical Research and Development Institute (TRDI) does both pre-R&D screening and post-R&D evaluation of projects.
- TRDI's dual-roles have resulted from an unintended path-dependent evolution due to the dearth of experts and expertise.
- Some of important MoD regulations, directives, and instructions have the broad, nebulous wording of technical requirements. (eg., aviation safety requirements of MoD and those of the Ministry of Land, Infrastructure, Transport and Tourism)
- TDRI and Japanese firms have compared and adjusted their ideas, informally, via retired SDF officers that the firms employ.
- This involves unintended closed networks, constituting significant barriers to new foreign entrants.
- An independent agency must be established for post-R&D evaluation, recruiting technical experts from TRDI and MLIT's aviation authority.

Conclusion: No big bang but limited, significant opportunity ahead

1) The GoJ: Set SM-3 related technology transfer to European allies as a precedent.
2) Japan (Gov. and B): Be ready for a continued junior partnership in a US-led international R&D projects for high-end weaponry.
3) Japan (Gov. and B): Actively explore a co-equal partnership in a European-led international R&D for helicopter, jet trainer/light attack aircraft, and UAVs.
4) Japan (Gov. and B): Develop an Master MOU and a Master Contract for intellectual Property,
5) US and Europe (Gov. and B): Consult Japanese Gov. and B about (4)
6) The GoJ: Change NDS and adapt US/EU type certification.
7) The GoJ: Establish an independent agency for R&D evaluation .