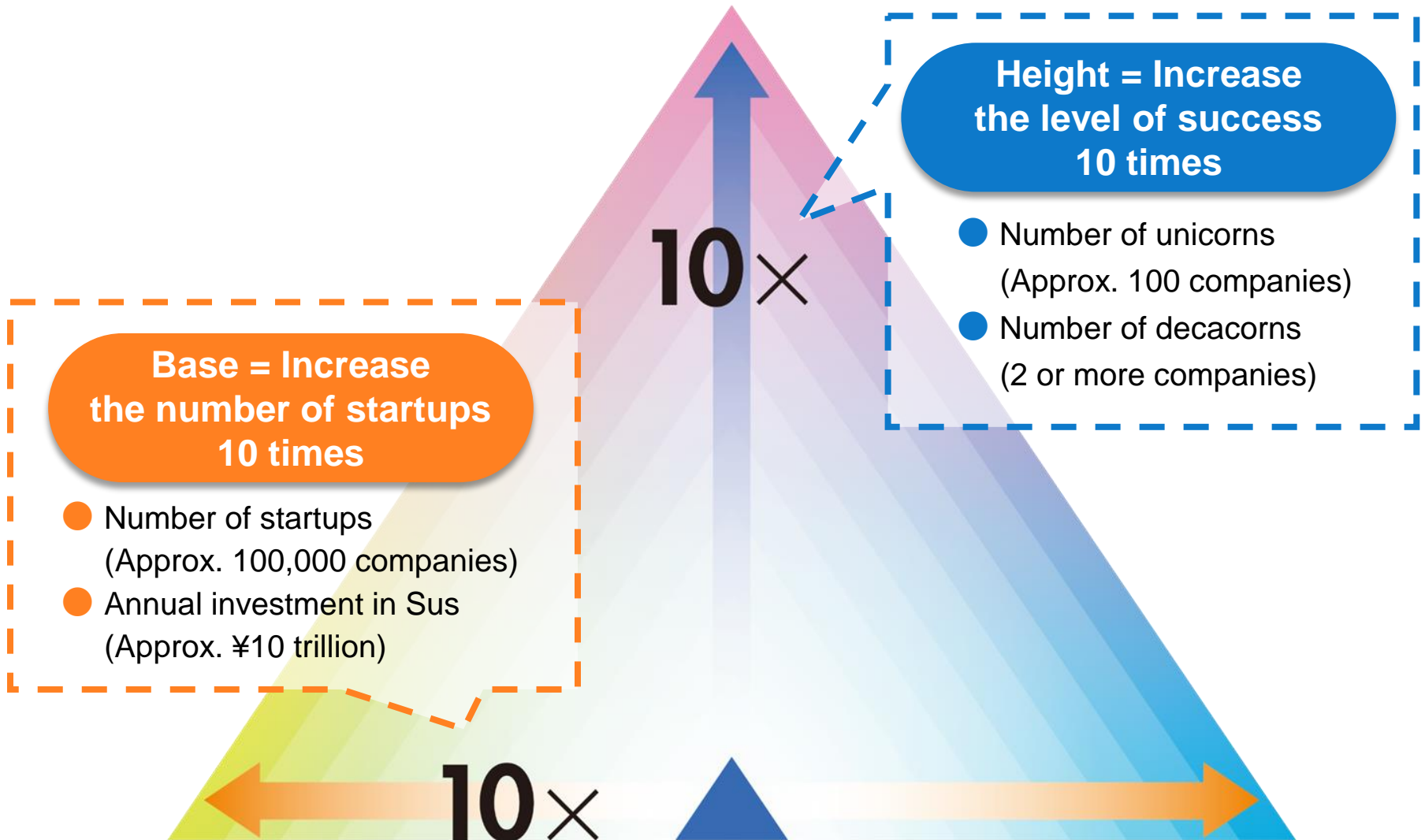




Science to Startup

September 17, 2024
KEIDANREN

The 10X10X Vision for Startup Breakthrough



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to Develop the Pathway of Science to Startup

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I. Introduction

Current Status of 10X10X

- In March 2022, Keidanren released its *Vision for Startup Breakthrough*. We have reviewed the progress of policies to achieve 10X10X every year since then.
- Because of the momentum created by government initiatives, **the base has expanded by 1.5.** **However, the height remains unchanged.**

(Sources)

Number of startups:

INITIAL Data Collection Summary

Annual investment:

INITIAL Japan Startup Finance 2023

Number of unicorns:

CB Insights

**Height = Increase the level of success
10 times**

	<u>2021</u>	→	<u>2023</u>
Number of unicorns	6		7
Number of decacorns	0		0

**Base = Increase the number of startups
10 times**

	<u>2021</u>	→	<u>2023</u>
Number of startups	16,100		22,000
Annual investment	¥869.2 billion		¥753.6 billion

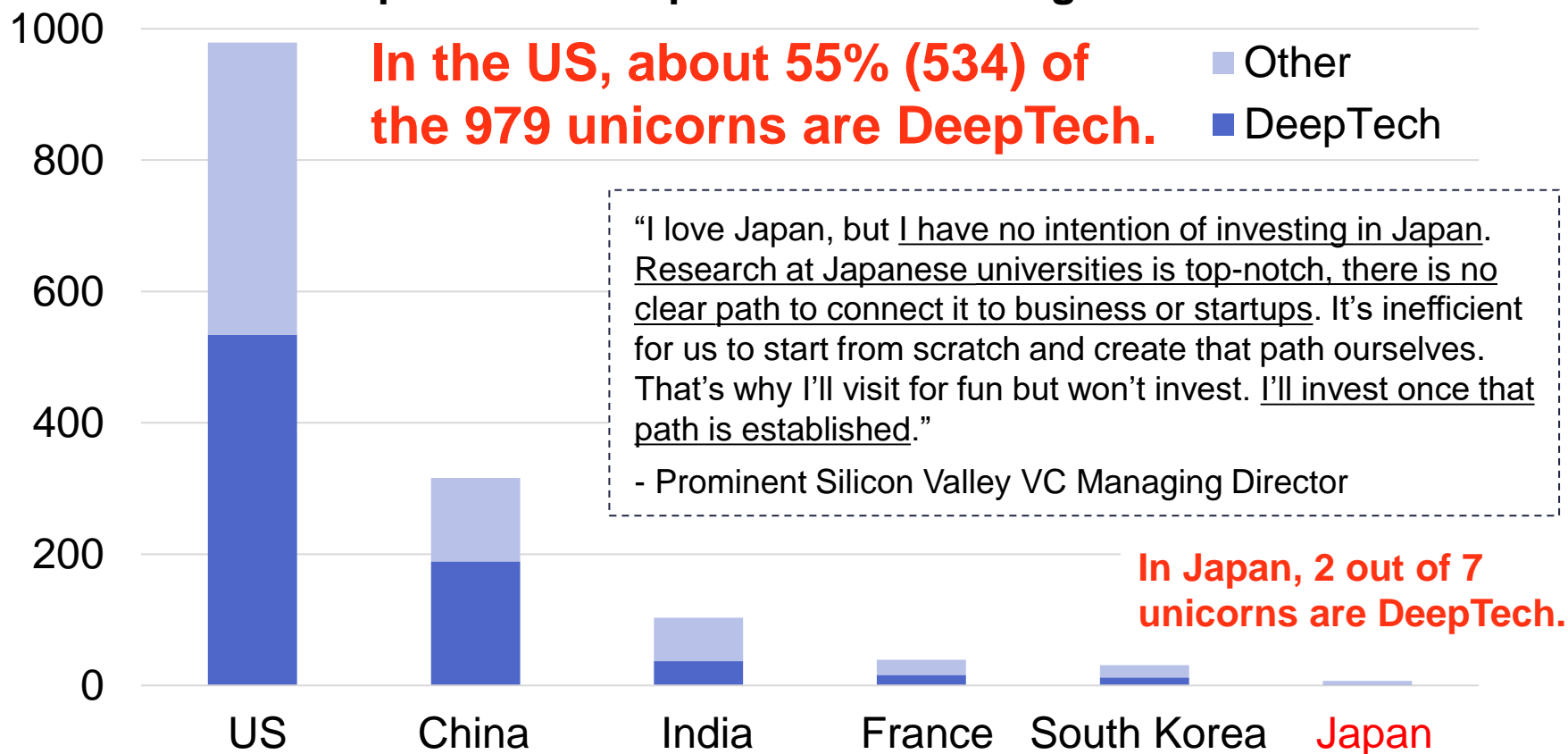
×1.5

↑ ×1

The Key to Increasing the Height is DeepTech

- There are still numerous world-class research projects in Japan, while the decline in Japan's research capabilities has been pointed out.
- However, the pathway to commercialize these strengths through startups remains underdeveloped.

Proportion of DeepTech Firms Among Unicorns



What is Science to Startup (StoS)?

= Commercialization of research through startups

1. Actively Seeking Out University Knowledge and Research
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4. Creating Success Stories by Leveraging Global Pathway
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Concentrate resources such as funding and talent on outstanding research



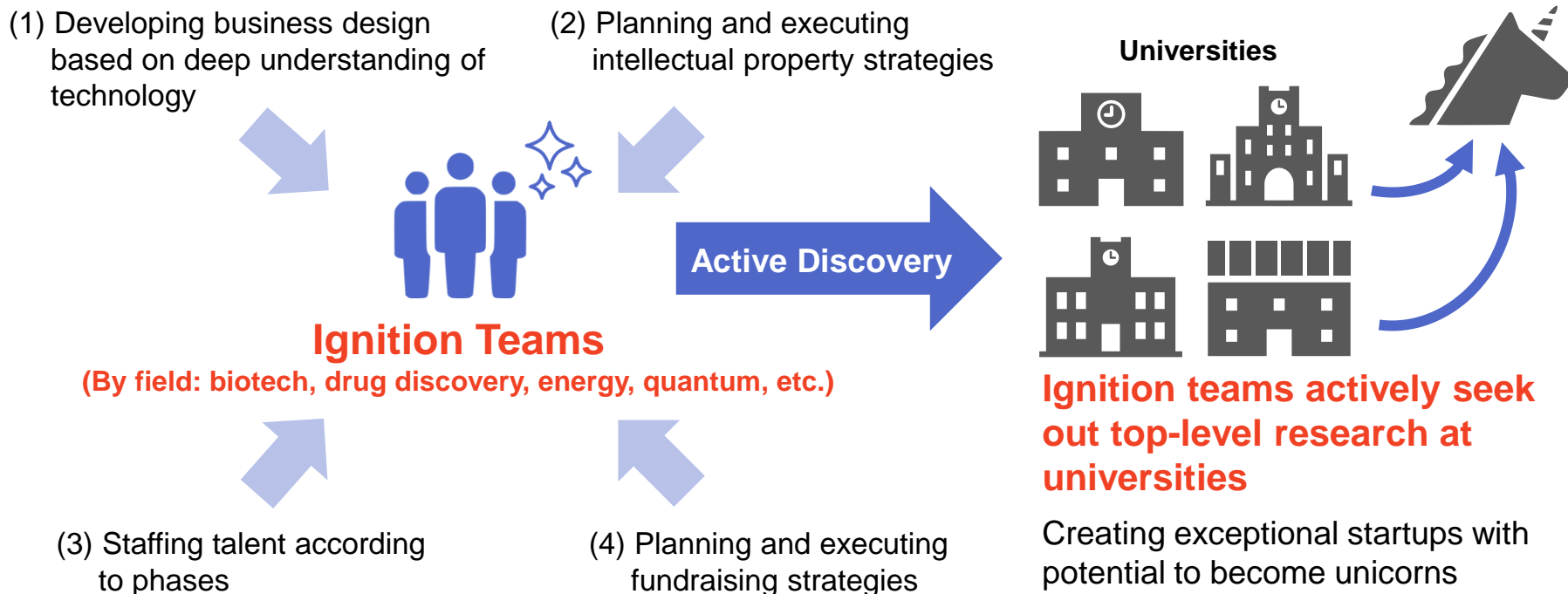
**Increase significantly the height of 10X10X
through the growth and expansion of university-based DeepTech startups**

II. Specific Measures to Develop the Pathway of Science to Startup

1. Actively Seeking Out University Knowledge and Research

Actively Seeking Out University Knowledge and Research

- Instead of waiting for startups to emerge spontaneously from universities, it is crucial to seek out promising technologies and ideas from external perspectives actively. **“Ignition teams”, -support teams consisting of professionals** in areas such as startup support, intellectual property strategy, and business strategy-, should be formed to **actively scout for these potential seeds**.
- Forming “ignition teams” **for each promising field** where Japan has a competitive advantage can be highly effective. One approach is to have these teams **operate on a national scale** spanning across multiple universities and regions. Efforts toward assessing and identifying researchers (**star scientists**) who consistently produce outstanding research can also be effective.
- **The government should support private sector initiatives to form support teams**, by leveraging existing frameworks and resources.

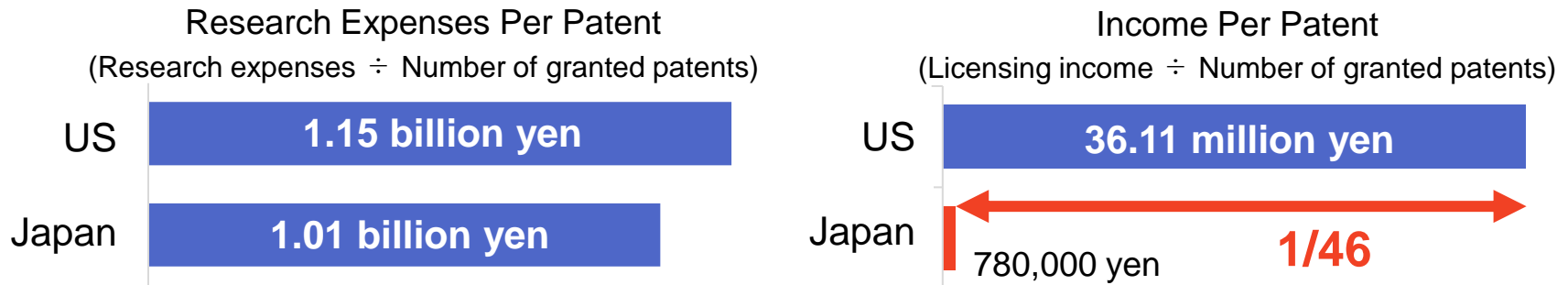


II. Specific Measures to Develop the Pathway of Science to Startup

2. Fostering StoS Momentum in Universities

2-1 Fostering StoS Momentum in Universities

- Commercialization and related support activities should be directly linked to the evaluation of professors and researchers by universities.
- Universities should significantly strengthen their internal support systems that promote the commercialization of university-originated technologies by **investing in talent** and collaborating with external VCs and support teams.
- The talent exchange between universities, startups, and industry should be increased drastically.
- KPIs for universities should include metrics related to the commercialization of **research outputs through startups** and should be applied as bonus points for universities actively engaged in commercialization.



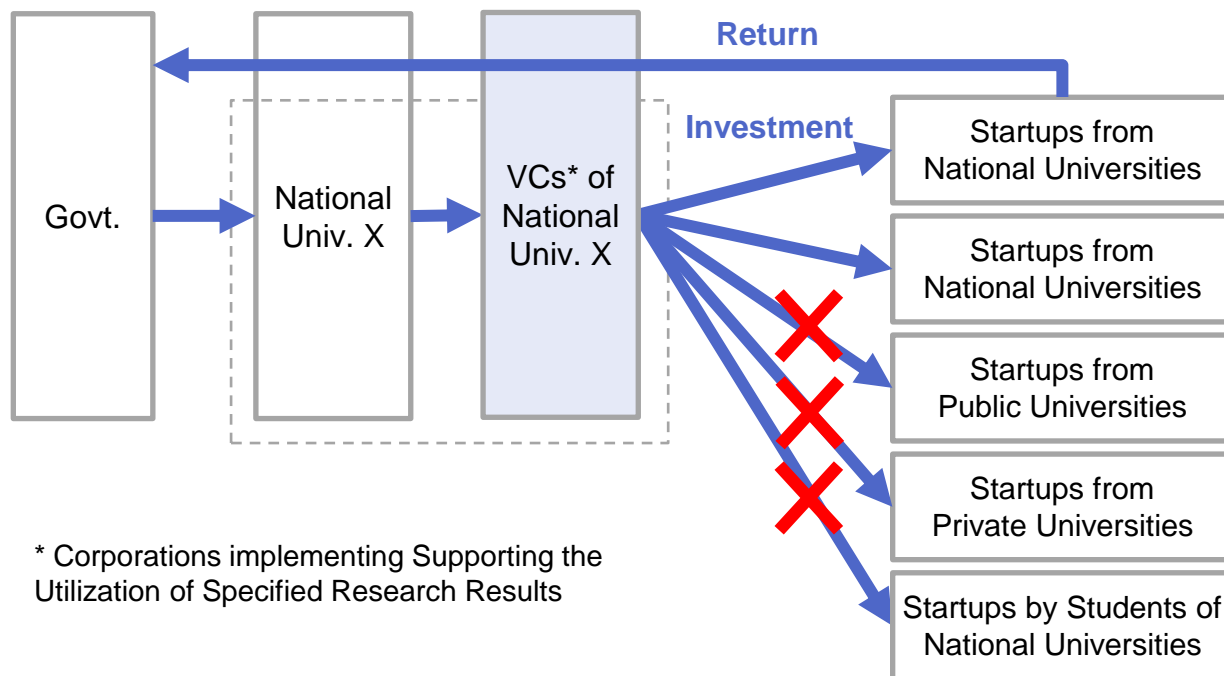
While many universities have traditionally focused on increasing the number of patent applications and granted patents, it is also true that a significant number of these applications have lacked strategic consideration.

2-2 Reforming the University VC System

- It should be promptly made clear that universities can freely utilize the capital gains generated by national university VCs based on “the public-private innovation program” by the Japanese government.
- Expanding the scope of national university VCs’ investments to include startups from public and private universities should also be considered.

The four national universities (Tohoku University, the University of Tokyo, Kyoto University, Osaka University) established VCs under the public-private innovation program. The VCs may have to return the full amount, including capital gains, to the government.

→ **Promptly clarify that universities are free to use capital gains as they wish**



National university VCs are strictly limited to investing in startups that utilize technologies originating from national universities.












↓
Expanding the scope of investments is one option

Quickly expanding efforts to establish public university VCs in Special Zones for Financial and Asset Management Businesses nationwide

2-3 Creating Top-Ranked Universities

- Through targeted support, at least one university should be elevated to the top 10, creating a successful model to generate momentum and spread StoS to other universities.

PitchBook's Top 100 Colleges Ranked by Startup Founders

Ranking		University	Founder count	Company count	Capital raised
1		Stanford University	2,731	2,135	\$127.2B
2		Massachusetts Institute of Technology (MIT)	1,914	1,474	\$75.2B
3		Harvard University	1,647	1,406	\$75.9B
4		University of Cambridge	1,156	961	\$29.3B
5		University of California, Berkeley	1,105	906	\$37.2B
6		University of Oxford	981	827	\$29.9B
7		Columbia University	912	821	\$27.2B
8		Carnegie Mellon University	682	559	\$24.1B
9		Imperial College London	678	561	\$11.4B
10		Cornell University	595	507	\$17.9B
48		University of Tokyo	212	170	\$6.0B

Source: <https://pitchbook.com/news/articles/pitchbook-university-rankings> (red box added by Keidanren Secretariat)
Rankings calculated for Undergraduate/Graduate/MBA categories. Figure shows Graduate ranking (published on 11/9/2023).

II. Specific Measures to Develop the Pathway of Science to Startup

3. Implementing Customer Discovery

Implementing Customer Discovery

- There are growing calls to evaluate **support programs specializing in customer discovery** for researchers and early-stage DeepTech startups.
- Drawing on examples such as I-Corps in the US and ASU in Japan, **customer discovery implementation and associated costs should be incorporated into national, regional, and university support programs.**

Effect

Benefit 1: Research can be redirected towards commercialization

Benefit 2: Entrepreneurial ideas and business models can be refined
before proceeding to feasibility studies or PoC

Overseas Examples

- **National I-Corps (US nationwide program)**
Training program for PhD students and faculty aiming to participate in the US SBIR program. Mandates **interviews with 100 potential customers over 7 weeks, providing \$50,000 in grant funding** for these activities.
- **Regional I-Corps (by regional university groups)**
Training program for regional university groups to apply for National I-Corps. Provides interviews with 20–30 people and related classroom instruction.
- **Programs at individual universities**
Carnegie Mellon University established the Customer Discovery Kickstart Program to support students ineligible for Regional I-Corps.

Domestic Example

Academic Science Unit (ASU) program by Tohoku University Hospital

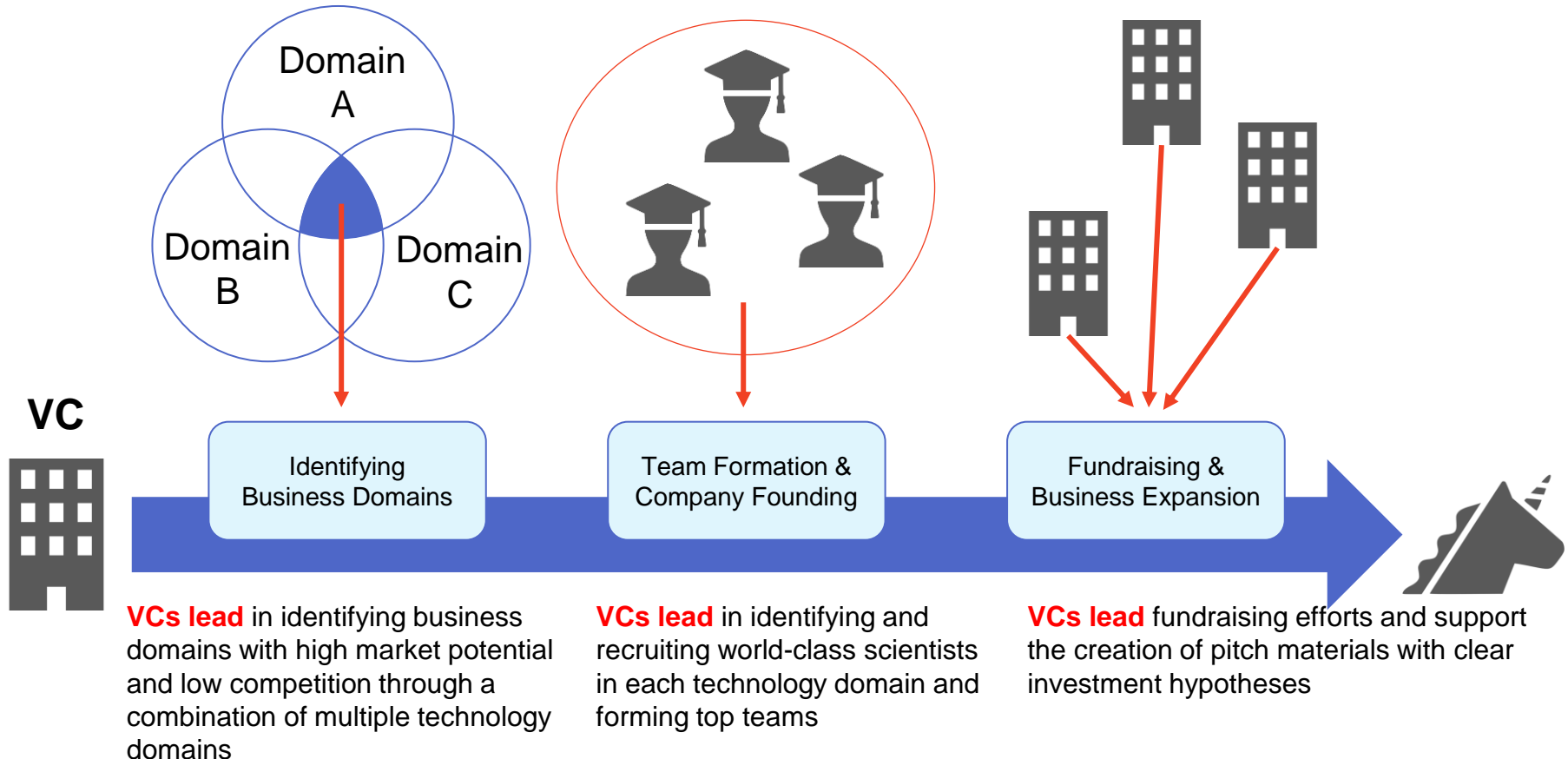
- Since its inception in 2014, has accepted around 70 companies and 1,700 individuals nationwide over 10 years.
- In a six-month program, it explores and narrows down needs, identifies development targets, and aims for commercialization of new medical devices, pharmaceuticals, systems, and services in collaboration with companies.

II. Specific Measures to Develop the Pathway of Science to Startup

4. Creating Success Stories by Leveraging Global Pathway

4-1 Japanese Researchers Applying “Top Gun Approach”

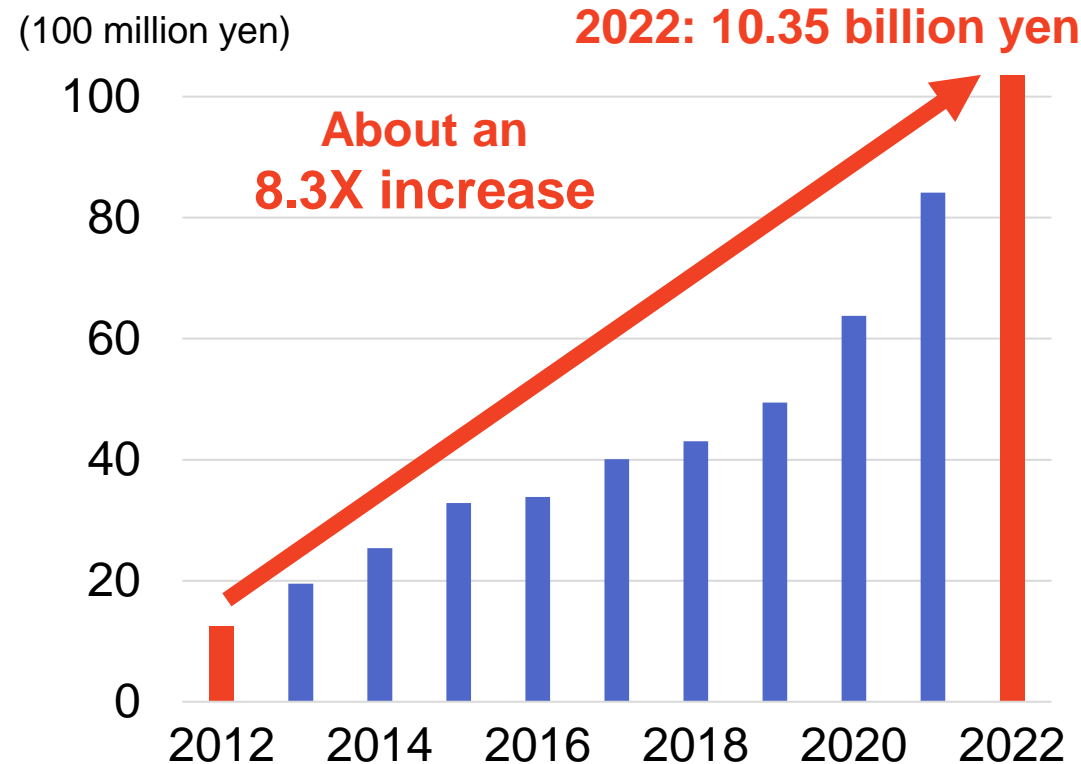
- In the US, “the Top Gun approach”, where experienced VCs identify promising areas, gather world-class researchers to form startups, and raise substantial funds based on their own business concepts, is expanding.
- Participation of Japanese researchers in projects led by proven overseas VCs should be increased.



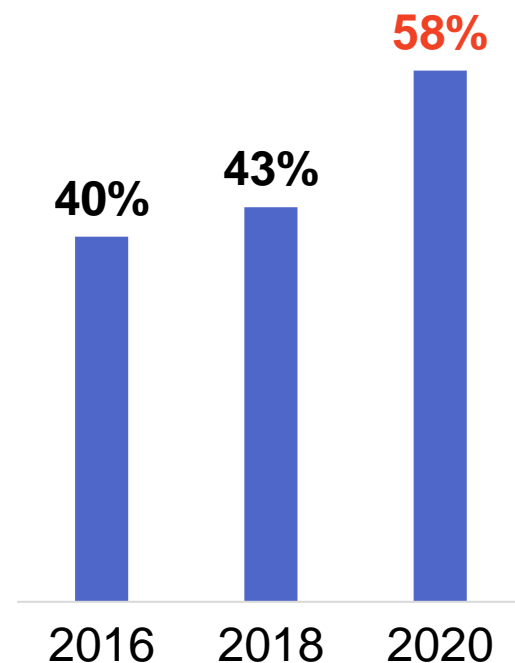
4-2 Addressing Increases in Paper Publication Fees

- Publication of papers is essential not only for participation in “the Top Gun approach” but also **for demonstrating Japan’s excellent research and researchers to the world.**
- **To ensure global recognition of specialists in the field and technologies in which universities have strengths, economic support should be provided to address the increasing research costs.**

Estimated Open Access Publication Fees



Respondents Citing “Lack of Funds” as the Reason for Not Publishing Papers



Source: Created by Keidanren Secretariat based on *A Survey on the Status of Paper Publications: FY2023* by Japan Alliance of University Library Consortia for E-Resources.

Source: Created by Keidanren Secretariat based on *A Survey on Open Research Data and Open Access 2020* by Ui Ikeuchi and Kazuhiro Hayashi.

4-3 Securing Slots in Fellowship Programs

- Information about fellowship programs in various countries that specialize in supporting researcher-led startups should be widely disseminated domestically, to create a strong track record of participation by promising Japanese researchers.
- By sponsoring proven overseas programs, **Japan should secure participation slots for Japanese researchers in top-tier programs** and **bring these programs to Japan, allowing Japanese researchers to experience the global dynamics of entrepreneurship directly.**

Examples of Various Programs Overseas

Activate (US)

- Offers a two-year fellowship program on the condition of 100% commitment
 - Living expenses of \$90,000 to \$110,000
 - Travel allowances, health insurance, relocation allowances, etc.
 - **\$100,000 for research and development**
 - Networking with engineers, investors, companies, etc.
 - **Curricula, workshops, etc., for researchers interested in starting a business**
 - Access to research facilities that can be used while protecting intellectual property
- 249 participants
- 196 startups produced
- Total fundraising of over \$2.3 billion

Wilbe (UK)

- Provides know-how and guidance to researchers interested in startups
- **Access to research facilities**
Examples: Milvus Superlab (University of Oxford, materials field), Expression Edits (University of Cambridge, biotechnology field)
- Funding for PoC (planned)

NLC (Netherlands)

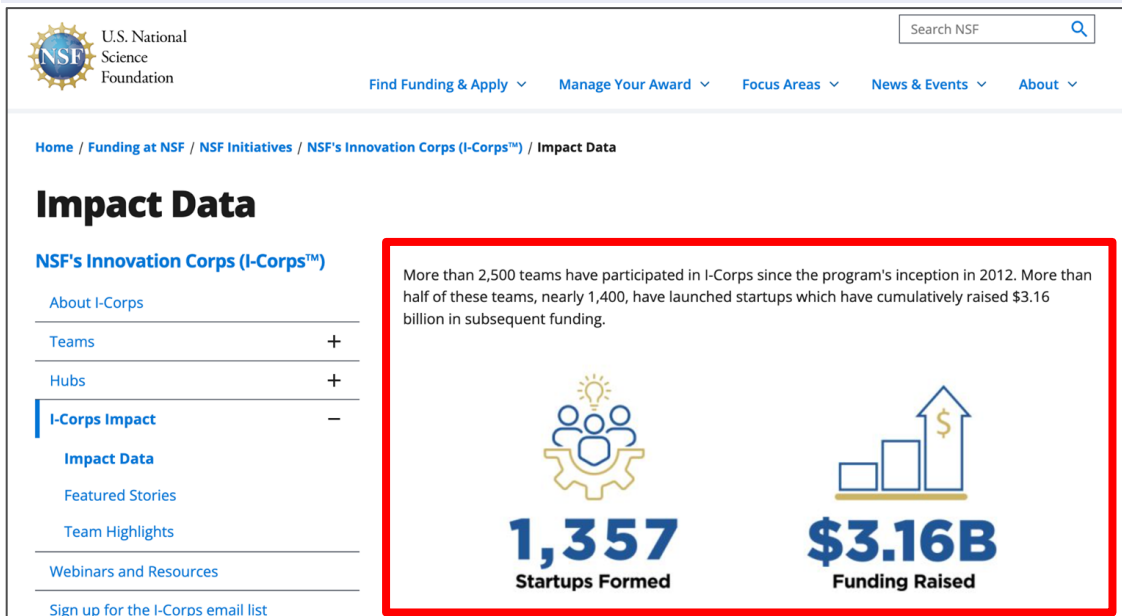
- Produces about 25 startups annually
- Total fundraising of over 36.2 million euros
- **Offers a 100-day program for business development when starting a business or when a new CEO joins**

II. Specific Measures to Develop the Pathway of Science to Startup

5. Maximizing the Impact of Government Support

5 Maximizing the Impact of Government Support

- To make various support measures easily accessible for startups, **a government-wide subsidy map should be created, and a support desk promptly established to provide unified navigation across ministries.**
- While most support programs limit their targets to Japanese corporations, **support should also be extended to foreign corporations with Japanese entrepreneurs or researchers active overseas, and to technologies originating from Japan.**
- **Operational issues should be improved**, such as excessive burden of paperwork, and the quality of reviewers (bias in expertise, lack of business perspective, etc.).
- **The effects of measures should be objectively evaluated and published using actual values (number of startups created, cumulative funding raised, etc.). Reforms should be constantly implemented to maximize effectiveness**, including consolidation and elimination of measures.
- **Procurement from startups should be further promoted.**



The US National Science Foundation (NSF) conducts annual surveys on KPIs such as the number and percentage of SBIR and I-Corps programs used, as well as the time from application receipt to grant decision. Reviews are conducted based on the results.

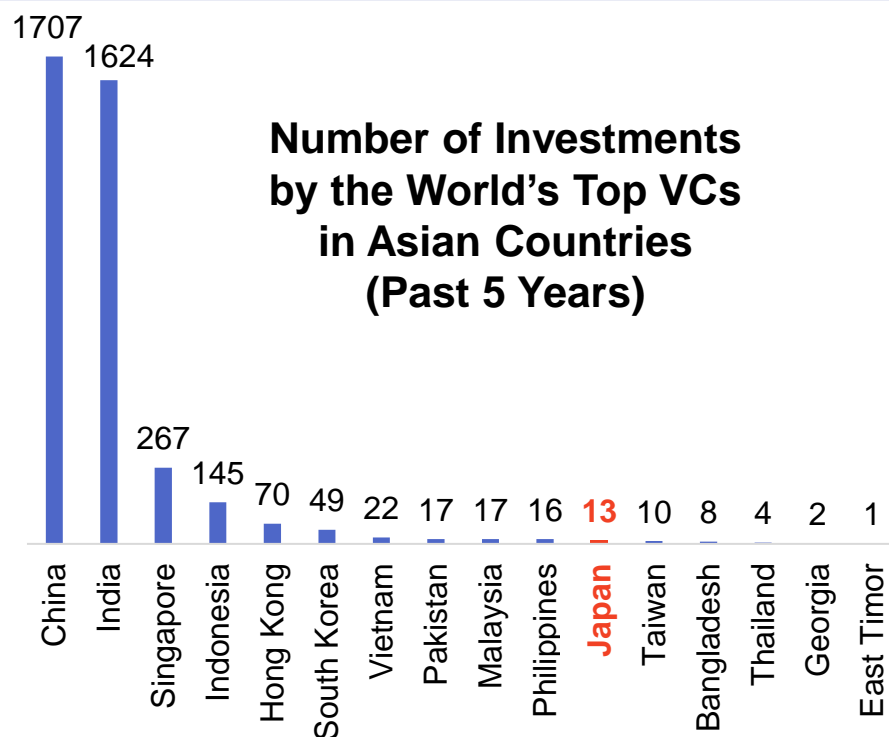
Source: National Science Foundation (NSF)
(red box added by Keidanren Secretariat)

II. Specific Measures to Develop the Pathway of Science to Startup

6. Creating a More Globally Open Ecosystem

Establishing a More Globally Open Ecosystem

- The government should **prepare explanations of relevant laws in English (including differences from Delaware law, etc.)** and regularly publish the most up-to-date information.
- **English contract templates should be issued** that are aligned with Japanese Limited Partnership Act for Investment.
- The Startup Visa, J-Find, J-Skip and other **measures/programs aimed at those overseas should be widely publicized abroad in English**, with KPIs regularly updated and published.
- **The special taxation for foreign partners should be revised**, including its procedures. For example, **the judgment criteria for determining less than 25% ownership should be based on the partnership interest at the end of the fiscal year.**



- Investment in Japan by top global VCs is about a quarter of that in South Korea. Japan is failing to attract global capital.
- Under Japan's current special measures, even temporary partnership shares of 25% or more may become subject to taxation. The uncertainty surrounding tax treatment makes it difficult to attract foreign investors as initial contributors.

Source: Created by Keidanren Secretariat based on materials from the 2nd Expert Panel on the Global Startup Campus Initiative.
 *Top VCs are defined as the top VCs that led investments in unicorns during the period from 2018 to 2022.

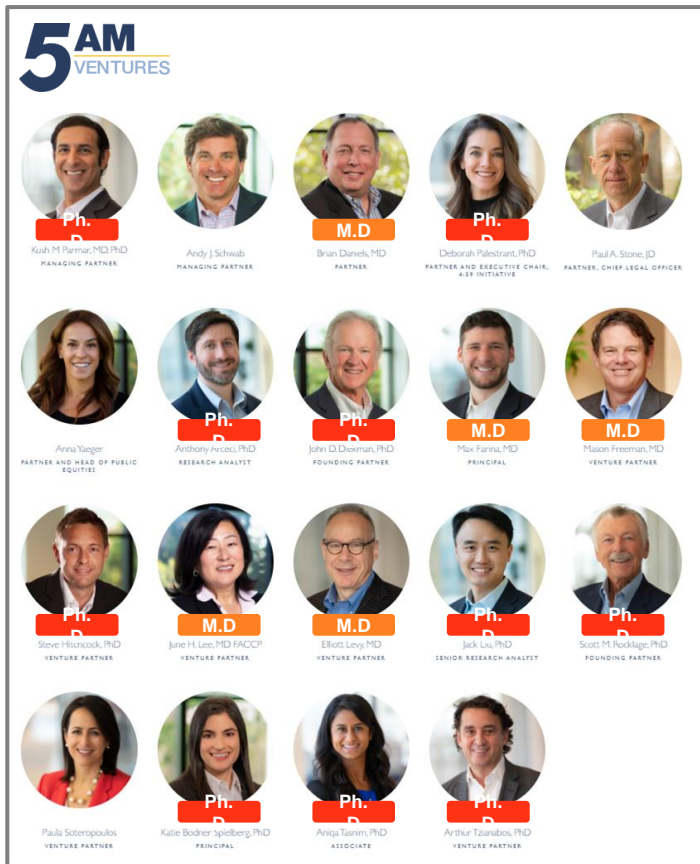
II. Specific Measures to Develop the Pathway of Science to Startup

7. Developing Talent to Accelerate StoS

7-1 Developing Doctoral Talent

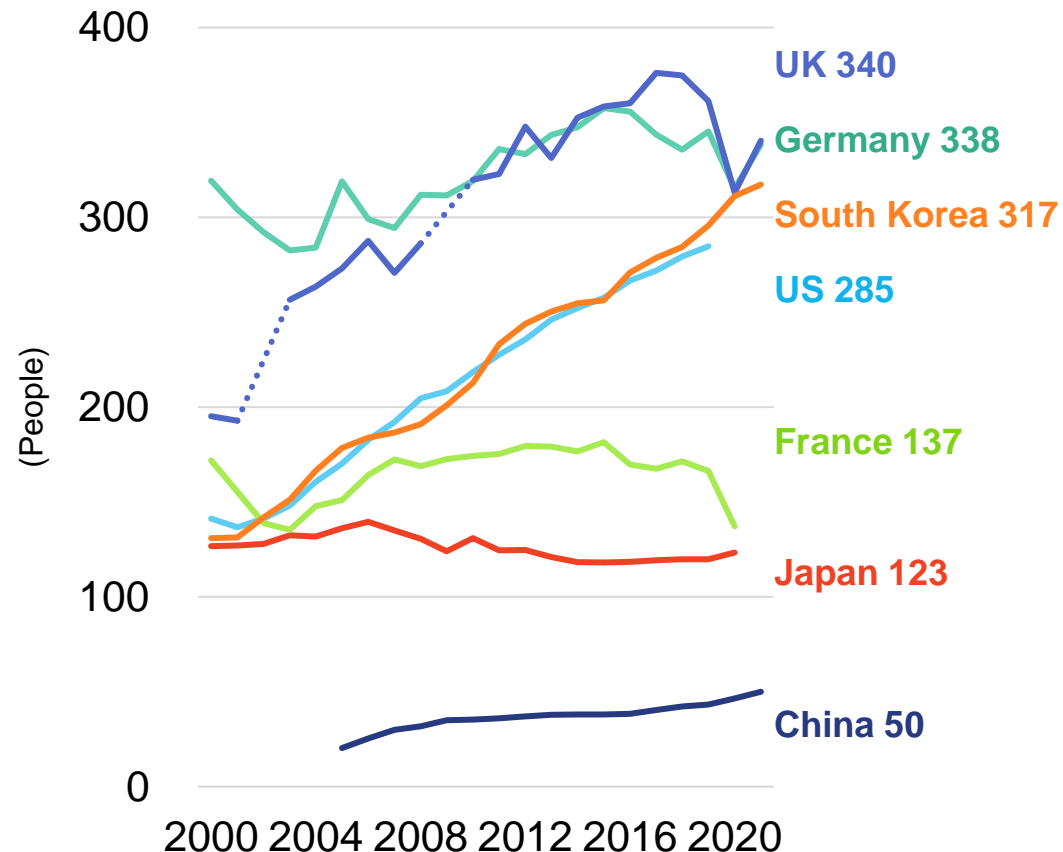
- To revitalize the ecosystem in the DeepTech field, **the active participation of doctoral scientists is essential in all startup support organizations** within and outside universities. The development of doctoral scientists should be accelerated and expanded, and appropriate compensation should be provided.

Examples of doctoral scientists Active in VCs



Source: Created by Keidanren Secretariat based on [5AM Ventures 5am Investment Team](#) (accessed August 29, 2024).

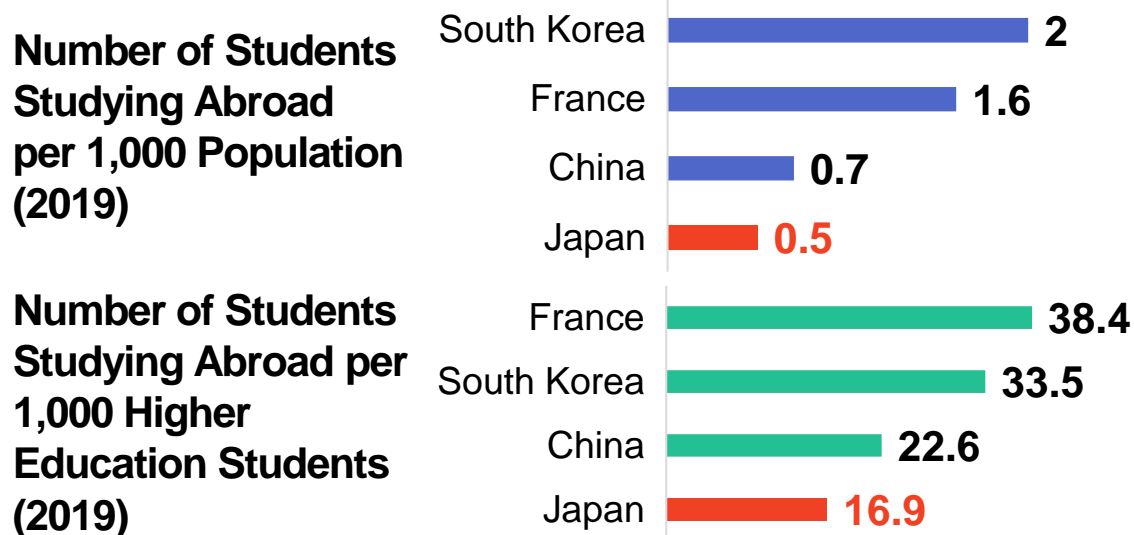
Number of Doctorates per Million Population



Source: Created by Keidanren Secretariat based on [Science and Technology Indicators 2023](#) by the National Institute of Science and Technology Policy.

7-2 Increasing Study Abroad Participation

- It's useful for researchers themselves to experience the atmosphere of the advanced StoS countries and witness the close connection between universities and startups. **Opportunities for Study abroad and overseas assignments to top-ranked universities for producing startup founders should be increased.**
- Drawing on examples like the National University of Singapore, the government should actively negotiate with foreign governments and top universities to **implement study abroad programs that enable Japanese students to study at top overseas universities.**
- Not only researchers but also **support staff within and outside universities should be sent abroad or participate in personnel exchanges.** This will create an ecosystem where numerous individuals who understand the ideal form of StoS are present in various roles.
- In addition to sending Japanese abroad, **efforts should be made to attract top-level graduate students, researchers, venture capitalists, and support personnel from around the world.**



Specific Example: National University of Singapore Overseas Colleges (NOC)

- A program where students who pass pre-screening work as startup interns during the day and study at partner universities at night for one year at overseas centers developed by the university.
- Over 4,000 students have participated so far, with program graduates founding more than 1,100 companies after returning to their home country.

III. Actions to Be Taken by Large Companies

IV. Conclusion

Actions to Be Taken by Large Corporations

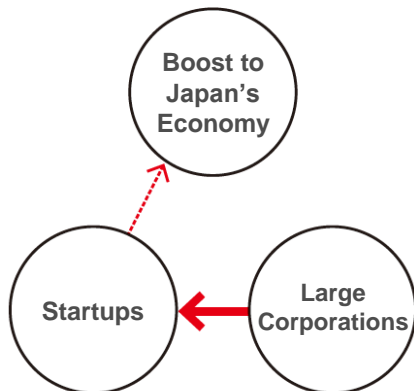
- Large corporations should also **promote carve-outs** to extract research and development results that have not been commercialized. They should actively consider **donating unused patents to startups or selling them at discounted prices for tax deductions**.
- The birth and strong growth of startups from excellent research at universities and companies is also a major benefit for large corporations. **The purchase/procurement of products and services from top startups, business alliances, new acquisition through M&A, and support for overseas expansion should be promoted.**
- **Increase talent mobility** and encourage personnel involved in business and intellectual property strategy in large corporations **to participate in startups, universities, VCs, etc.**

Keidanren's "Startup-Friendly Scoring" Concept

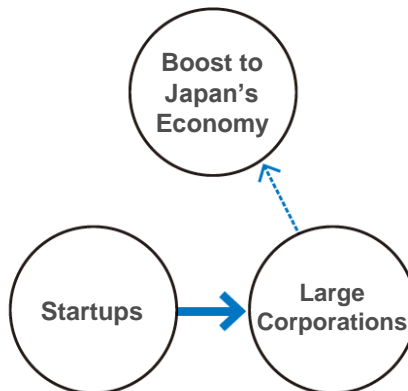
Visualizing companies' startup-friendliness from three perspectives:

"Resource provision," "Business/talent acquisition," and "Business/talent output"

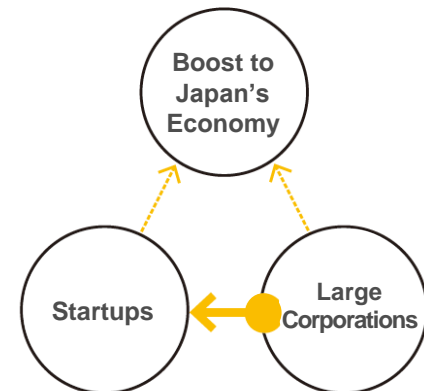
**Procuring products/services,
providing talent/funding,
and forming business alliances**



Mergers & Acquisitions



**Carve-outs, spin-offs,
and talent output**



Conclusion

- In the virtuous cycle of Science to Startup, startups and intellectual property are **born from university research**, profits are generated from the growth of startups and licensing of intellectual property, **profits circulate back to universities**, and **new research is born** from the increased research funds.
- Many seeds of startups lie dormant in Japan's excellent research. There are two and a half years remaining until 2027, the target year for 10X10X.
The StoS pathway should be developed as soon as possible to serve as the foundation for realizing 10X10X and further growth thereafter.

