Boosting Japan’s Startup Ecosystem

The great potential for Japanese innovation rebound

Tokyo Development Learning Center

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Team Lead
Tokyo Development Learning Center
Innovation is increasingly focused on start-up development and commercialization. COVID-19 mRNA vaccinations were largely a product of startup innovation.

Global COVID-19 Vaccine Market (Q1, 2021)

- Innovative startups: 48%
- Pfizer/BioNTech: 24%
- Moderna: 14%
- Sinovac: 14%
- AstraZeneca: 5%
- Johnson & Johnson: 4%
- Russia Sputnik: 3%
- Others: 2%

Vaccine Manufacture Share by Global Value (2019)

- GlaxoSmithKline (GSK): 40%
- Merck: 17%
- Pfizer: 17%
- Sanofi: 15%
- Others: 11%

Sources: (left) WHO (right) Morningstar (Estimates)
Boosting Japan’s start-up ecosystem presents a great potential for its forward-looking competitiveness.
Boosting Japan’s start-up ecosystem presents a great potential for its forward-looking competitiveness.

Tokyo is today the only true startup ecosystem in Japan, but it is small on global terms.

Number of Funded Start-ups

Tokyo 1,232
Bangalore 9,704
Beijing 3,542
Berlin 3,522
Tel Aviv 2,746
New York 12,555
San Francisco 22,498
Singapore 8,196
Paris 5,024

Sources: Tracxn database, updated to April 2021, Dataset #1 for Japan
Tokyo Ecosystem is dominated by traditional institutions that do not cater to start-up needs.

Investors
Universities
Accelerators
Start-ups

Sources: Dataset #1
Tokyo Ecosystem is dominated by traditional institutions that do not cater to start-up needs.

Sources: Dataset #1
The start-up “growth-driven” specialized ecosystem in Tokyo is small and has little influence.

Tokyo presents the reverse image of New York and other leading global start-up ecosystems.
The ecosystem is predominantly domestic; it has very little international connectivity. Tokyo only relevant link is with San Francisco for accessing innovation through investment.

Sources: Dataset #2, last updated in 2019.
Growth-oriented capital is limited (below 25% of start-up investment), and disproportionately deployed in small stages and ticket sizes.

Distribution of VC Investment Stages

<table>
<thead>
<tr>
<th>Region</th>
<th>Seed</th>
<th>Early</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>61%</td>
<td>33%</td>
<td>7%</td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>North America</td>
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<tr>
<td>Global</td>
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</table>

Average Deal Size per Investment Stage Category, US$ Millions

<table>
<thead>
<tr>
<th>Region</th>
<th>Seed</th>
<th>Early</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>0.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>1.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td>0.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global</td>
<td>0.96</td>
<td>12</td>
<td>15</td>
</tr>
</tbody>
</table>

Beyond supply problems; the pipeline of start-ups is also not satisfying the needs of Japanese investors and corporations.

Investment Balance Gap (received vs provided) in Unicorns

<table>
<thead>
<tr>
<th>Country</th>
<th>Balance Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Korea, rep.</td>
<td></td>
</tr>
<tr>
<td>India</td>
<td></td>
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<tr>
<td>France</td>
<td></td>
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<tr>
<td>United Kingdom</td>
<td></td>
</tr>
<tr>
<td>China</td>
<td></td>
</tr>
<tr>
<td>Israel</td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td>-0.38</td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td></td>
</tr>
</tbody>
</table>

Sources: CBInsights, 2021, February data; author’s analysis.
There are no mature scale-up accelerators that can help start-ups to grow at global scale.

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**Percentage of start-ups having raised funding over...**

- **Angel Pad**
  - $1M: 53%
  - $10M: 23%
  - $100M: 3.20%
  - $1B: 0%

- **Plug&Play Tech center Global**
  - $1M: 53%
  - $10M: 22%
  - $100M: 2.26%
  - $1B: 0.11%

- **500 Startups**
  - $1M: 48%
  - $10M: 15%
  - $100M: 2.07%
  - $1B: 0.09%

- **Techstars**
  - $1M: 41%
  - $10M: 10%
  - $100M: 1.11%
  - $1B: 0.12%

- **Plug&Play Tech center Japan**
  - $1M: 41%
  - $10M: 10%
  - $100M: 0%
  - $1B: 0%

- **Open Network Lab**
  - $1M: 23%
  - $10M: 6%
  - $100M: 0%
  - $1B: 0%

- **Samurai Incubate**
  - $1M: 22%
  - $10M: 2%
  - $100M: 0%
  - $1B: 0%

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Sources: Accelerator websites: 500 startups; Techstars; AngelPad; Plug and Play Tech Center Global; Plug and Play Tech Center Japan; Samurai incubate; Open Network Lab; Pitchbook database; and Tracxn database. Dataset #3.
Compared to global ecosystems like New York’s, Tokyo lacks a population of domestic mentors and angels.

Sources: Dataset #1
When compared to leading universities from around the world, Japan's top universities lag behind in terms of startup and unicorn production, as well as startup funding.

Sources: Tracxn database for U.S. universities (June-July 2021); Crunchbase database for Japanese universities (May 2021).

Note: University of Pennsylvania and Columbia University combine data from undergraduate programs and their business schools.
### Recommendations

**Investment**

**Support Infrastructure**

**Skills and Talent**

<table>
<thead>
<tr>
<th>GAPS</th>
<th>OVERALL SMALL VC SIZE</th>
<th>LIMITED INT’L FUNDS AND GLOBAL GROWTH EXPERIENCE</th>
<th>SCALE-UP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action</strong></td>
<td>Catalyze and attract new funds at every stage, with focus on mid-late stage</td>
<td>Attract int'l funds and talent</td>
<td>Catalyze scale-up funds (domestic and int’l) and increase the quality of investable pipeline</td>
</tr>
<tr>
<td><strong>Policy</strong></td>
<td>Co-invest (directly, fund of funds)* and catalyze new funding</td>
<td>Market regulation and transparency</td>
<td>Co-invest*, catalyze new funding</td>
</tr>
<tr>
<td><strong>Example</strong></td>
<td>Israel (Yozma and Heznek) fund co-investment programs*</td>
<td>Tax incentives for talent acquisition</td>
<td>Set up goals and partnership with J apanese scale-up funds</td>
</tr>
<tr>
<td></td>
<td>Germany co-investment growth facility*, French seed Tech (seed co-investment*), UK Future Fund</td>
<td>Incentives through co-investment</td>
<td>Pan-European Investment Fund</td>
</tr>
<tr>
<td></td>
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<td>US SEC and EC guidelines; secondary markets</td>
<td>France late-stage VC co-investment funding*, UK Future Fund</td>
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<td>Singapore VC tax incentives</td>
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<td>UK and Germany's VC investment tax relief programs</td>
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<td>Korea fund of funds and foreign VC investment fund</td>
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*Note: Policy examples are illustrative*

*Note*: Co-investment between government and private investors
Recommendations

**Investment**

**Support Infrastructure**

**Skills and Talent**

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<th>Policy</th>
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<tr>
<td>SMALL SIZE AND LACK OF GLOBAL ACCELERATORS</td>
<td>Co-investment* of international accelerators and build deep-tech vertical programs (domestic and scale-up)</td>
<td>Co-invest*, catalyze new funding and presence of int’l accelerators</td>
<td>Israel, Finland, France, Korea subsidies and co-funding of accelerator programs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Catalyze domestic deep tech accelerators with partnership guidance</td>
<td>France vertical deep tech accelerator program</td>
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<td></td>
<td>Attract int’l mentors and start-up talent through hands-on co-creation programs to develop local talent capabilities</td>
<td>Attraction of talent through hands-on co-creation programs to develop local talent capabilities</td>
<td>UK Global Entrepreneurship Program (GEP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tax incentives and promotion of international mentors’ programs</td>
<td>Korea K start-up Grand Challenge, France Concours i-Lab</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>France early-stage tax exemptions, UK Angel co-investment fund, Korea secondary market for angels</td>
</tr>
<tr>
<td>LIMITED NUMBER OF DOMESTIC MENTORS AND EXPERIENCED START-UP SCALE-UP TALENT</td>
<td>Catalyze corporate and public startup growth-oriented programs</td>
<td>Direct and facilitate accelerators partnership with corporate and public S&amp;T programs</td>
<td>Israel and Massachusetts provision of funding to MNC to build innovation hubs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Public procurement catalyzation of new startup markets</td>
<td>NASA catalyzation of space transportation market</td>
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<tr>
<td></td>
<td></td>
<td>Deep tech public-PPP challenges and regulatory sandboxes</td>
<td>COVID warp speed, DARPA challenges Korea regulatory sandboxes</td>
</tr>
<tr>
<td>CORPORATE AND PUBLIC PROGRAMS ARE NOT GROWTH-ORIENTED</td>
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Note*: Co-investment between government and private investors

Note: Policy examples are illustrative
## Recommendations

### GAPS

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<tr>
<td>LACK OF PRACTICAL ENTREPRENEURSHIP PROGRAMS</td>
<td>Create practical education ecosystem programs in all university campuses</td>
<td>Berkeley, MIT, Sweden Stockholm School of Entrepreneurship (SSES) university ecosystem of support programs</td>
</tr>
<tr>
<td>LIMITED R&amp;D COMMERCIALIZATION IMPACT</td>
<td>Catalyze comprehensive programs of ecosystem development through partnership funding incentives</td>
<td>Korea university-entrepreneurship center, specialized incubator universities program and AI schools</td>
</tr>
<tr>
<td>LIMITED INFORMAL EDUCATION AND TALENT CONVERSION FROM CORPORATES</td>
<td>Expand programs reach and partner with accelerators (vertical deep tech)</td>
<td>Chicago mHUB, Massachusetts Life Science Center; Israeli Life Science Funds</td>
</tr>
</tbody>
</table>

### Policy

- Attract and build domestic and int’l informal educational programs and incentives to enable talent mobility
  - Grants and investment, direct partnership
  - Tax incentives and benefits platform mobility for entrepreneurship conversion
  - UK apprenticeship and practical education programs
  - Finland startup grants

**Note:** Policy examples are illustrative; deep-tech verticals may include Artificial Intelligence (AI), quantum computing, regenerative medicine, autonomous driving, blockchain, cybersecurity, virtual reality, lithium-ion batteries, drones and conductive polymers.
Illustrative examples of activities and comprehensive university programs

- Entrepreneurship curricular courses available for all students
- Business plans competitions and hackathons,
- Camps and Pitch competitions,
- Acceleration and incubation
- Invention
- Mentors, angels and fellows
- R&D commercialization support
- Grants, seed and VC support investment
- Alumni and post-doc VC funds

Example in Focus

Start-up Practical Education Ecosystem

1. **Startup Support**: post-doc entrepreneurship, free ventures, Xaccelerator, Berkeley startup cluster, SkyDeck.

   SkyDeck -> accelerator, incubator, mentoring, global innovation program and investment fund

2. **New product R&D support**: invention lab, fellows, Innovate Berkeley, theme programs

3. **Investor funds**: Grants, Seed fund, Alumni fund, Research fund, SkyDeck fund, angel network

4. **University ecosystem**: academic programs, product/ market fit support, legal, recruiting and intellectual property support

Source: Berkeley University
Expand Beyond Tokyo to diversify and Grow Japan’s deep-tech start-up ecosystem leveraging S&T Cluster Potential

Policy in Focus #2

Illustrative examples of innovation hubs and corporate-public startup labs; This is not a recommendation or endorsement.
Tokyo
Start-up
Ecosystem

A global innovation leader with large potential for start-up expansion

September 2021

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Notes

The findings of this presentation is supported by the secondary data sources, complemented by some primary data.

The main data sources used for the analysis of Japan were compiled through a survey of Japanese start-up founders and ecosystem stakeholders, which was conducted by the Cabinet Office under the guidance of the World Bank team (Dataset #1).

**Dataset #1**

**Sample size:**
3,914 start-ups and an overall 6,086 ecosystem entities (including start-ups)

**Geographical location:**
Tokyo, Kansai (Kobe, Kyoto, and Osaka), and Fukuoka

**Sample information:**
- each company’s founding year, address, type of business, founder’s information (such as education and previous jobs), and the associated investors and accelerators
- Data from New York ecosystem was collected by Endeavour Insights in 2014 and it includes an overall of 9,168 ecosystem entities (including start-ups)

**Dataset #2**

**Sample size:**
3,131 startups and 5,991 associated investors in the following deep-tech sectors: Artificial Intelligence (AI), Robotics, Space-Tech and Quantum Computer (QC)

**Sample information:**
- Start-up location (global), investor location (global), investment relations within cluster and among clusters (global)

**Dataset #3**

**Sample size:**
65 accelerator programs (global)

**Sample information:**
- accelerator programs, location, management entities, supporting entities, type of accelerator, associated start-ups and mentors
Slides 12, 13, 14 and 19:
Dots represent ecosystem stakeholders. Lines represent connections between stakeholders and start-ups based on stakeholder role (e.g., investor connection is an investment, accelerator connection is participation in the acceleration, school connection is education of start-up founder in such school).

Slide 15
Data here are artificial intelligence, robotics, space technology, and quantum computer. Only the frontier use of those technologies is included. The use of technologies that is accessory (e.g., a noncore use of the technology for the business model) is not included. Startups and investors are clustered by location of origin. The dots represent these clusters. The size of the dots is proportionate to the number of startups and investors in each cluster. The larger the size of a cluster the larger the number of start-ups (receiving investment) and investors (making investments) a cluster has.

Slide 16
For benchmarking purposes, stages have been unified to the international standard followed by CBInsights: seed stage for deals below US$3M; early stage for deals between US$3 million and US$5 million and late stage for deals above US$5 million, INITIAL data are based on funding received by start-ups per investment series, which have been adapted to follow the CBInsights value criteria. For Japan ticket size stages, VEC classifications may differ as the value of each state referred to is not disclosed. Instead, VEC methodology refers to the stage of the company, which may not correspond with CBInsights’ classification, especially for early and late stages. For benchmarking purposes, VEC classifications of early stage and expanding stage have been merged into early stage.


