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Technology Strategy and Management

The Puzzle of Japanese Innovation and Entrepreneurship

Exploring how Japan's unique mixture of social, educational, and corporate practices influence entrepreneurial activity.

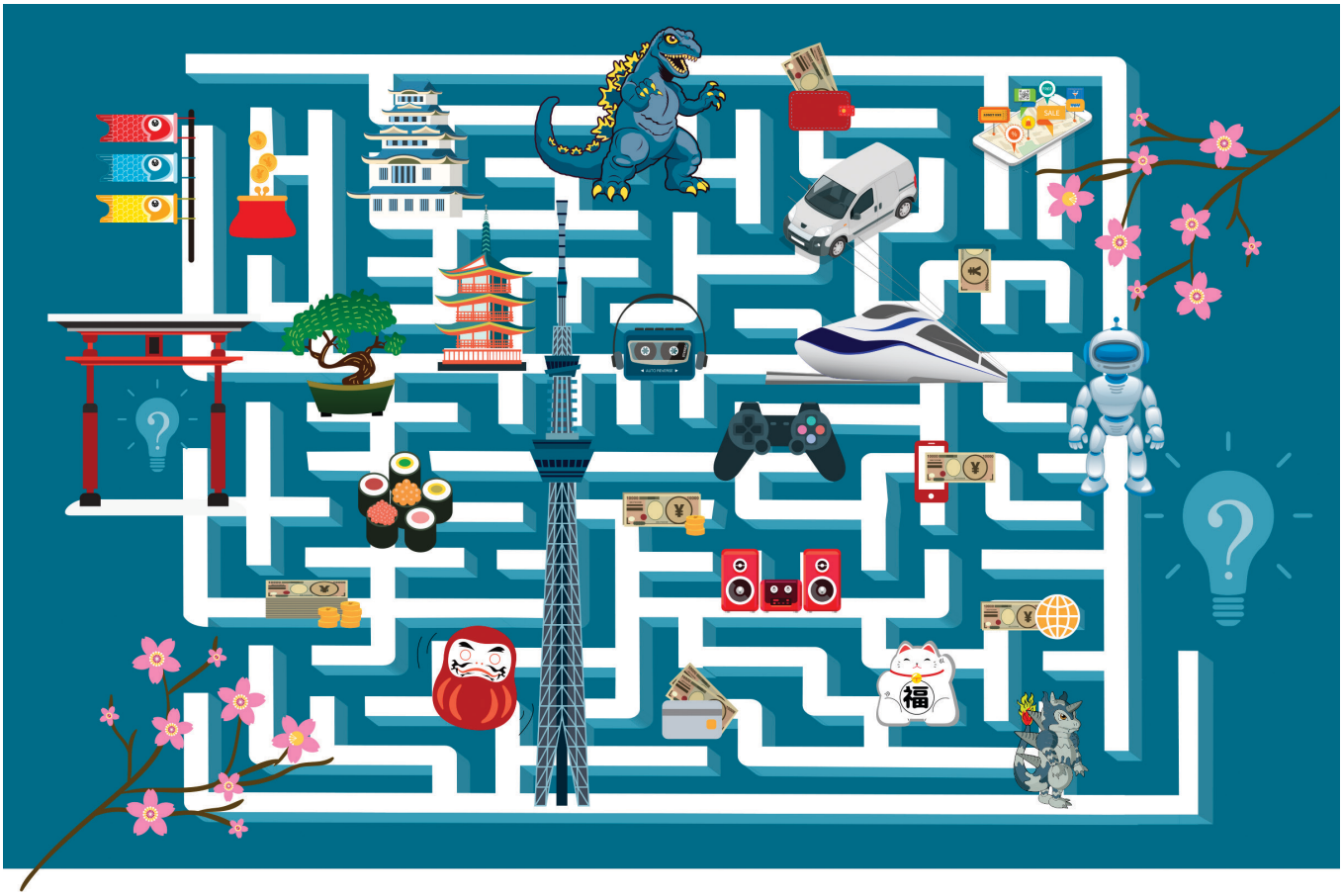
After living in Japan for seven of the past 40 years, I recently returned for an institutional development project at Tokyo University of Science. Tokyo University of Science is a private university founded in 1881 with over 20,000 students, and is the largest source of engineers and scientists for Japanese industry. The university is also the Japan host for an educational and research initiative called MIT REAP (MIT Regional Entrepreneurship Development Program).[a]

We have been dealing with the following puzzle: Japan was once renowned for creating powerful, global companies, especially in manufacturing industries like automobiles, consumer electronics, semiconductors, and computer hardware. Japanese government and industry partnerships also once promised to revolutionize information technology, with bold initiatives such as the VLSI (Very Large-Scale Integration) Project of the 1970s for semiconductors and the Fifth Generation Computing Project of the 1980s for artificial intelligence. Japanese companies have since developed admirable hardware skills and competence in many aspects of software. But we no longer see bold innovation initiatives in Japan, nor do we see much entrepreneurial activity. What happened?

After opening the country to the West in the 1860s, a first generation of Japanese entrepreneurs organized large industrial conglomerates known as the "zaibatsu"—led by the Mitsui, Mitsubishi, and Sumitomo groups. They centered around mining, trading, and banking. Other firms appeared around World War I, led by Toshiba, NEC, Hitachi, Nikon, Shiseido, Kobe Steel, and Matsushita (Panasonic). These firms brought in Western technologies and business practices. In the 1920s and 1930s, younger Japanese entrepreneurs started more technology-driven companies such as Toyota, Nissan, Fujitsu, Ricoh, and Canon.[5] After World War II, another generation founded Honda, Sony, Nippon Telephone and Telegraph (NTT), and many other new firms.

Sony in particular combined advanced consumer electronics with sleek product designs, and inspired no less than a young Steve Jobs at Apple. Either the Sony Walkman, introduced in 1979, or NTT DoCoMo's i-mode "feature phone," introduced in 1999, might have evolved into what became the Apple iPod and iPhone. They did not, as Japanese companies lagged behind in software, networking, and digital technologies. We still see this gap today, despite (or

a See http://reap.mit.edu/



perhaps because of) Japan's penchant for quality, discipline, and detail in computer programming (see "The Puzzle of Japanese Software," *Communications*, July 2005).[2] As in software development, innovation and entrepreneurship require experimentation and risk-taking, and those attributes do not seem to be highly valued in today's Japan.

Japan still boasts many of the world's largest companies and iconic brands. Any visitor to Tokyo can also see that the country still possesses enormous wealth, creativity, and vitality. But interest in launching bold innovation initiatives and establishing pioneering new companies seems to have waned, especially compared to other developed countries.[7] The Global Entrepreneurship Monitor even ranked Japan last among 24 developed countries in terms of entrepreneurial activity.[6] The scarcity of new firms no doubt has contributed to some 30 years of sluggish, and sometimes negative, economic growth.

Recent data on venture capital shows Japan far behind China and the rest of Asia, as well as the U.S., though the Japanese do seem to understand that they need to create more startups that can help grow the economy. Japanese venture funding in 2015 totaled just $629 million. This compares to $59 billion in the U.S.—nearly a 100-fold difference, even though the U.S. has only 2.5 times Japan's population.[9] The number of Japanese companies going public did reach an eight-year high in 2015 at 98.[9] However, the total number of new Japanese companies being founded peaked in 2006 at 1,359 and fell to 809 in 2015, with stagnant levels of total invested capital. There has been relatively little infrastructure in Japan to promote entrepreneurship, such as in education and innovation centers at universities or private and public startup incubators, although this is changing.

The MIT REAP program likes to analyze regions in terms of "innovation capacity" (I-Cap) and "entrepreneurial capacity" (E-Cap). One measure of I-Cap, for example, is the number of patents a country or region produces given its population. One can also look at relative investment in R&D, networking infrastructure, universities, and other factors. One measure of E-Cap is the number of new firms being established. One can also look at availability of private and public venture capital, availability of entrepreneurship education, or intentions of people at different ages to create new firms.

The Tokyo team is still gathering data, but Japan clearly appears to have the potential to create many more new companies than it does, especially in technology. Data comparing patent rates per population in different countries versus new firm creation shows Japan near the top among countries in this measure of innovation capacity but near the bottom in entrepreneurial activity. I suspect the Japanese can do better because historical data indicates Japan's low rate of startup creation is a relatively recent phenomenon. There were periods of very high activity following World War I and then again before and after World War II, as Japan modernized, militarized, and then rebuilt its post-war economy.[b]

One reason for low entrepreneurial activity may have been the large amount of capital previously required

b This data was collected from the Tokyo Stock Exchange, the Japanese Ministry of Finance, and Mizuho Securities.

IMAGE BY ALICIA KUBISTA/ANDRIJ BORYS ASSOCIATES

to register a company, now reduced from as much as $100,000 to the equivalent of one cent.[3] Another reason Japanese startup numbers seem low compared to the total number of firms may be because, unlike in the U.S., the Japanese are less inclined to dissolve existing firms, probably for tax reasons.[1] Other data suggests that Japan creates slightly larger companies than the average among OECD countries but then these companies tend not to grow very much, probably because of the paucity of venture capital until recently.[4]

Other factors inhibiting Japanese entrepreneurs are more difficult to quantify, such as social expectations combined with demographic trends and large-firm employment practices. For example, Japan has very low levels of unemployment (just over 3% in 2016) and a declining population. Nearly everyone graduating from university is guaranteed a good job, many until retirement. Since the vast majority of startups do not succeed, in any country, it is an enormous risk for young Japanese to create new companies. What if they fail? In the U.S., even people with failed startup backgrounds are considered to have valuable experience and can usually get good jobs in established companies. In Japan, companies recruit new employees mainly from new university graduates. In addition, in the U.S., entrepreneurs can separate corporate bankruptcy from private bankruptcy. In Japan, this is much more difficult to do. There is also a strong social stigma attached with failing as well as not following a conventional career path. Japanese parents expect their children (or spouses of their children) to get stable jobs with big companies or the government.

Startups from American universities also seem to benefit greatly from several practices that are rare in Japan. Classes mixing students from multiple schools (for example, engineering, science, and management) are common in the U.S. but infrequent and sometimes prohibited in Japan. Rigid rules often limit students and professors to classes and appointments in their individual faculties. It is difficult to launch an effective startup if all the members have only technical or only management backgrounds. Research on MIT startups showed this many years ago, indicating the single most important factor predicting the success of a technical venture was the existence of a founding team member with a background in sales or marketing (see my column "Evaluating a Startup Venture," *Communications,* Oct. 2013, and Roberts).[10]

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Direct government initiatives have played a relatively minor role in U.S. innovation and entrepreneurship, apart from massive defense spending and some medical science initiatives. However, in countries that lack large venture capital communities, or many private startup accelerators and incubators, government can play a big role. Japanese government ministries have taken various measures to encourage venture activities, entrepreneurship education, and funding. Key national research organizations have adopted modest programs to facilitate spin-offs. In 2016, there were also some 200 business plan competitions in Japan. Many connected to private initiatives such as Slush Asia, Samurai Venture Summit and Samurai Incubator, and the MIT Venture Forum of Japan.

Japanese universities have been slow to support entrepreneurship and have very limited funds of their own, but they are moving forward, too. A private venture fund (UTEC) closely connected with the University of Tokyo has been the clear leader, but Keio, Waseda, and a few other universities have also been active. They have received government support and established university-industry liaison programs, design labs, venture incubators, educational initiatives, and even small venture funds.

Japan's particular mix of social, educational, and corporate practices, along with demographic realities, will continue to hinder individual entrepreneurs who do not have government, university, or corporate support. At the same time, there is potential for more university-led and corporate entrepreneurship in the form of "spin-outs." Large, established firms and some venture funds have the resources to fund new initiatives and run experiments, though big companies are usually not the best settings to tackle risky technologies and potentially disruptive business models.

So, what is the answer to our puzzle? The reality is that Japan has continued to produce entrepreneurs, but they have not had much access to growth capital or experienced venture capitalists. Nor have they gotten much encouragement and support from the government and universities, or society more broadly. The situation is now changing, and we should see Japan nurture yet another generation of entrepreneurs. This time, they will probably come more from large firms and a few leading universities rather than from the general population. It is an open question how much impact they will have on Japanese economic growth and venture creativity in the future, but I am hopeful. C

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