

**Asia's New Networked Technonationalism: Advantage, or Disadvantage for Japan  
and the United States?  
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In September of 1997, I arrived at Tokyo University as a young Fulbright dissertation fellow to study entrepreneurs leading small and medium sized manufacturers. My kind faculty host, supervising my research activities was Professor Kodama Fumio of the Research Center for Advanced Science and Technology (RCAST) at Tokyo University. Kodama sensei is known for being an architect of the concept and policies related to industry-university partnerships (*sangakurenkei*, 産学連携).

For two years, I, a fourth generation “Nikkei” from the Japanese global diaspora and my research was supported, and guided by mentors including Kodama – who were not afraid to challenge the status quo to support junior women, and in my case, a foreign one at that. This included introducing me to other mentors in their personal social networks, and to government officials, entrepreneurs and others to interview for my research. I discuss the notion of diaspora later in this essay.

In my 2005 book *Innovation and Entrepreneurship in Japan*, I found that certain entrepreneurial firms survived and prospered under the “lost decade” (失われた十年). While their domestic competitors failed, successful high technology firms managed to connect with and expand their own international strategic entrepreneurial networks, helping them to access markets and capital. The same goes for findings in my 2014 book chapter about women entrepreneurs in Asia, which focused on successful women entrepreneurs in China and Japan. A typical story is that a woman – possibly after studying abroad in college – works for a time at a large multinational corporation, then she starts her own company, while drawing from the international professional and venture finance networks established while studying and working abroad. In this typical scenario, international networks compensate for lack of, and weaknesses in, domestic business networks for entrepreneurial women and men. In recent decades, Chinese, Indian, and other Asian entrepreneurs have been more successful at this than their Japanese counterparts.

Now, in 2018, twenty something years after I arrived in Japan as a Fulbright Fellow at Todai, much has changed. At the same time, much has remained the same. Here I focus on the opportunities for transformation of Japan’s innovation and entrepreneurship ecosystem rather than dwell on the past.

In the 20<sup>th</sup> century Japan, and Asian economies that emulated Japan perfected technologies in automobiles and electronics, gaining global market share, eventually competing head-to-head with American industry. These countries often succeeded and then surpassed U.S. competitors thanks in part to state policies targeting these sectors of the economy. These countries did so under a vision of what has been called technonationalism. Technonationalism equated national security with technology independence (from Western countries in particular).

In the 21<sup>st</sup> century, the new competition is over emerging sectors including biomedical. The biomedical industry is comprised mainly of pharmaceuticals and medical devices. Compared to the 20<sup>th</sup> century, the competitive landscape is more populated now, and includes rising competition from China and India. Like Japan, these countries have made a strategic bet on biomedical, and have invested at the national level in stimulating innovation and entrepreneurship at the technological frontier. Why biomedical?

First, global revenue tops US\$2 trillion, while the global market for biomedical products is upwards of US\$10 trillion. Second, global healthcare expenditure has risen to ten percent of GDP and is expected to remain high for the foreseeable future. To date, more than half of global revenue in biomedical is generated in the United States and Europe. Future growth will be driven by market opportunities in Asia.

Consequently, the biomedical industry has become the “next big thing” for countries around the world, promising global market dominance and the chance to set a generation of international industry standards. As a result of this fierce competition, national governments have turned to new technonational solutions. What is “new” about this technonationalism?

Key to the new networked technonationalism in Asia is harnessing international diaspora networks. Japan, for example, defines its diaspora as “nikkei” or all Japanese people who have relocated overseas on a permanent basis, including their descendants. By 2014, Japan had 3.5 million in its global diaspora. In contrast, India has 25 million and China has at least 50 million. In fact, by the time Japan had endured its first lost decade of the 1990s, both India (2004) and China (1978) had created entire national units devoted to engaging with their global diaspora talent. Even Singapore, which has explicitly emulated Japan’s successful developmental state, with a modest diaspora of 212,000, has also established a national agency to engage with foreign and diaspora talent (1998). Viewing these trends through the lens of biomedical entrepreneurs, it becomes clear how the new networked technonationalism at the state level translates into innovation at the firm level.

Ms. Kiran Mazumdar-Shaw is India’s richest self-made women entrepreneur, having a net worth estimated at \$3.3 billion in 2018. Ms. Kiran Mazumdar-Shaw was born in 1952 in Pune city, Maharashtra in India. Mazumdar-Shaw learned the craft of brew making from her father, a master brewmaster for Indian beers. Mazumdar-Shaw studied to be a brewmaker like her father, but after graduating from university in Australia, no brewery in India would hire her in this traditionally male dominated industry. Instead, Mazumdar-Shaw looked outside India for her next opportunity.

To make beer, you need to understand enzymes, which Mazumdar-Shaw knew well. In 1978, she partnered with an Irish company to produce the digestive enzyme papain, derived from

Papaya. From this, the company Biocon was born. Early on, Mazumdar-Shaw recognized that Japanese had the highest quality enzymes, while producing them the most efficiently with the least waste, compared to suppliers from Europe. Biocon scientists, a number of whom were diaspora returnees, were soon dispatched to Japan to learn koji based enzyme production techniques. Soon, she decided to pivot to biopharmaceuticals, starting to make cholesterol reducing drugs and insulin. Today, Biocon is India's largest biopharmaceutical company, with 10,000 employees. To help stimulate more biomedical innovation and entrepreneurship in India, Mazumdar-Shaw and Biocon spearheaded the establishment of the Biocon Park Special Economic Zone in 2006 in Bangalore. China's biomedical innovators and entrepreneurs have benefited similarly from national diaspora friendly policies. China's new networked technonationalism is decades ahead of India's and its entrepreneurial ventures have benefited likewise in number, and scale.

Turning back to Japan, what has changed since the first lost decade of the 1990s? First and foremost, it need not be said, is the economic rise of China. This has come with an increase in economic participation at all levels, including in high growth new firm ventures with global reach.

In Japan in 2018, one bright spot is that Japanese political leaders, including Abe Shinzo, have signaled that women, who represent half of Japan's labor force, must be better integrated into the Japanese economy – in particular at executive and board levels. This will benefit women of course. More importantly though this integration is (radical reform in immigration policy notwithstanding) a potential solution to the skilled labor shortage caused by the aging society and low birth rates.

Is the lost decades transforming into opportunities for Japanese women and men? Maybe.

Where could there be more progress in creating the system level pathways from Japan's stellar innovation capacity to entrepreneurial ecosystem development? In my 2019 Stanford University Press book *Beyond Technonationalism: Biomedical Innovation and Entrepreneurship in Asia*, I explore the connections between innovation capacity and entrepreneurial ecosystem development in China, India, Japan, and Singapore.

In the book, I propose a new framework of “networked technonationalism” to explain how countries including China and India have adopted a quasi-open, yet fundamentally technonationalist stance in pursuing developmental goals. These countries benefit from harnessing global diaspora networks in making technology investments and entrepreneurial gains in the domestic economy. What does this mean for Japan and the United States?

That is, what must be done to improve Japan's entrepreneurial ecosystem, and maintain entrepreneurial leadership at the technological frontier in the United States? Some suggestions not surprisingly include building on existing international network connections. An example discussed in *Beyond Technonationalism* in this regard is the U.S. connections behind Japanese stem cell scientist and entrepreneur Shinya Yamanaka's research that led to the Nobel Prize recognized innovations in iPS “induced pluripotent stem cells” that he and hundreds of lab members have since continued at Kyoto University. Similar dynamics are found in cases of Japanese entrepreneurs in Singapore, and Chinese diaspora returnees, known affectionately in China as *hai gui* (a homonym with “sea turtle”). To date, the U.S. has

been the beneficiary of inward flows of global diaspora talent, enhancing our American innovation and entrepreneurial ecosystems, reinforcing international network synergies.

Building on international connections includes embracing international, foreign, and diaspora networks. While Japan will never be able to compete with the Chinese and Indians on volume, it can compete on quality. Japan still has many gems to be found in frontier science and technology (S&T), innovation capacity, as the example of Kyoto University researchers in stem cells demonstrates. In the United States, global diaspora friendly immigration policies could, and should, build on past success. Together, Japan and the United States are poised to extend their already strong bilateral security, investment, and trade partnership to a pan Asian and American innovation and entrepreneurial ecosystem.