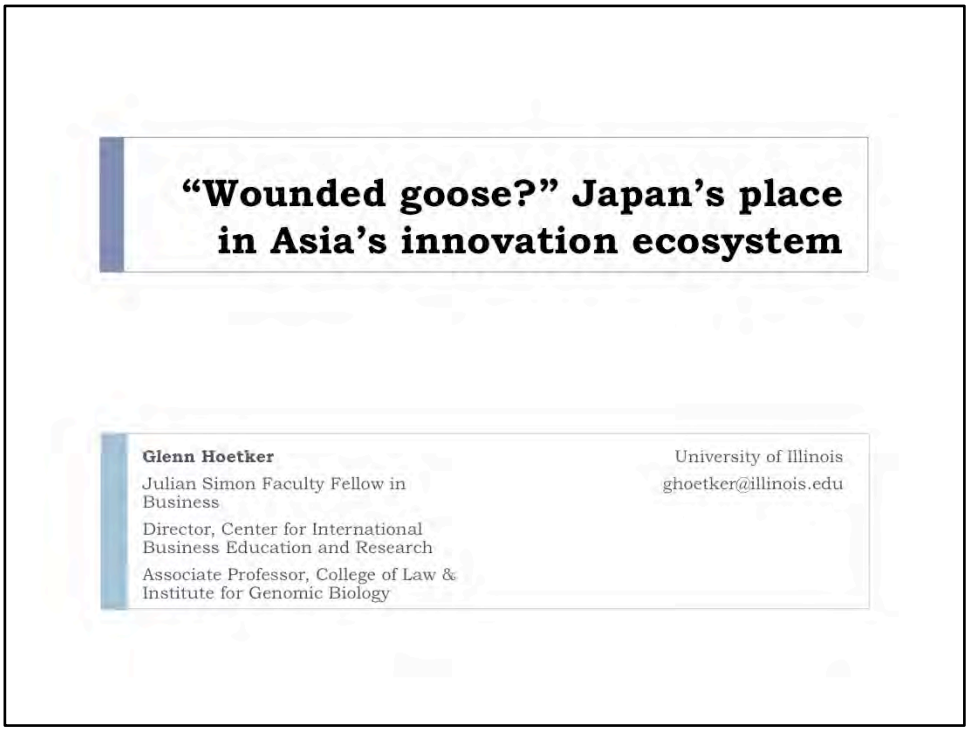
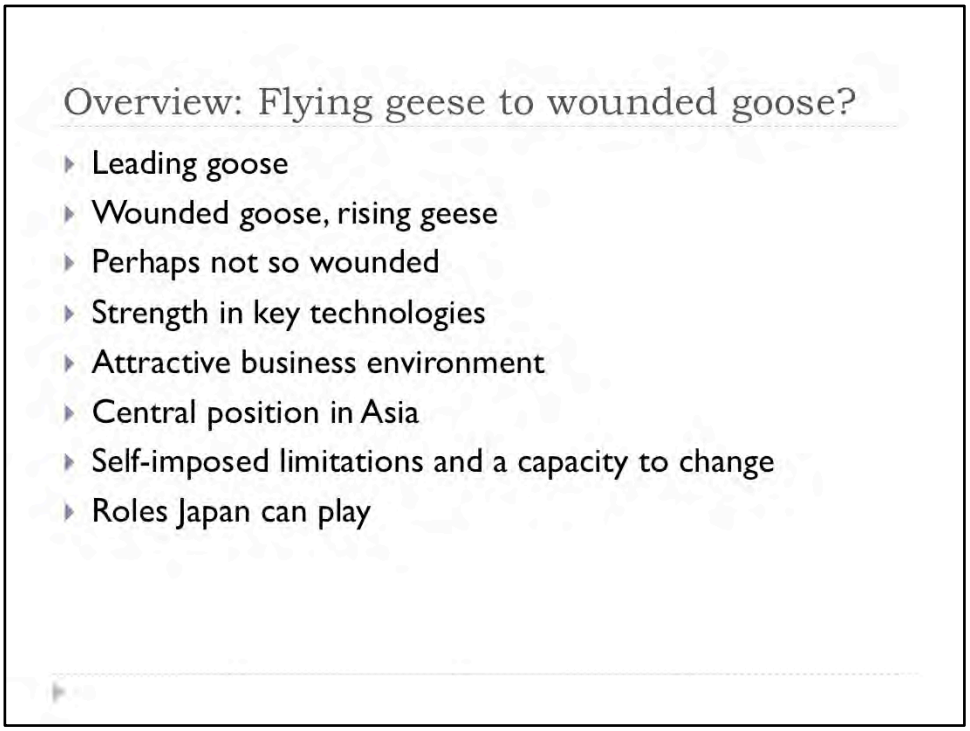
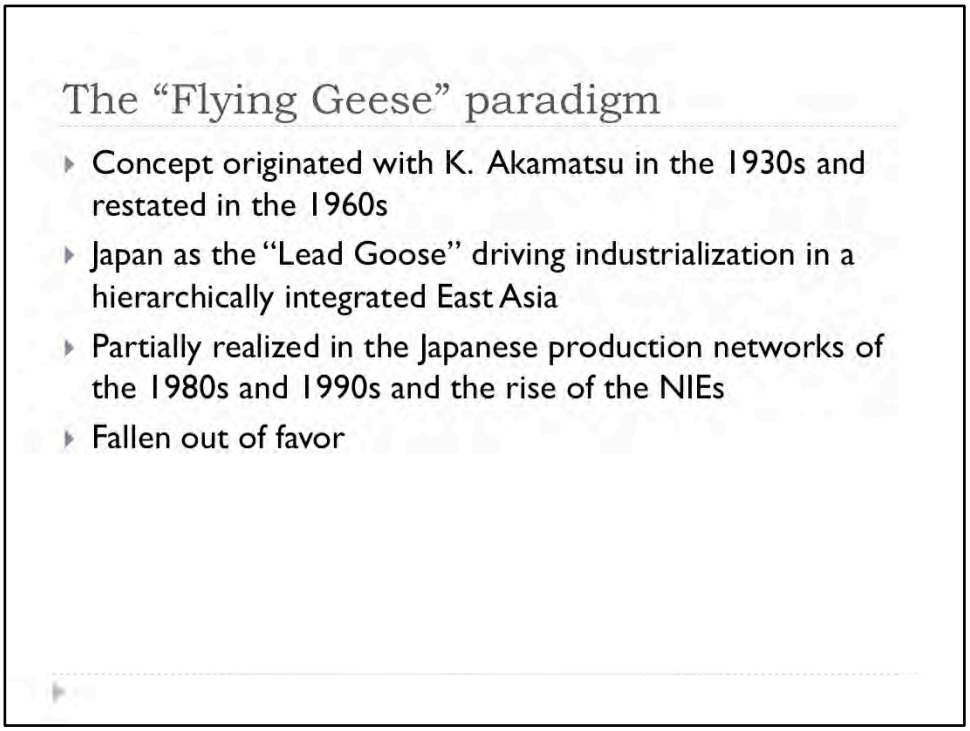


This paper has its origin in a campus-wide program on science and technology in Asia that I organized last year. The organizing committee with which I was working developed a list of potential topics. Geographically, the topics covered China, India, Korea, Singapore, Taiwan…but not a single project on Japan. As a Japanologist, I was understandably upset. As a scholar of innovation, I was actually quite worried because I believe that Japan continues to have an important and distinct role to play in the innovation ecosystem of Asia and, by extension, the world. It is a different role than we used to understand Japan to play and our research, management, and policy making will be better if we appreciate both the changes and the enduring importance of Japan.

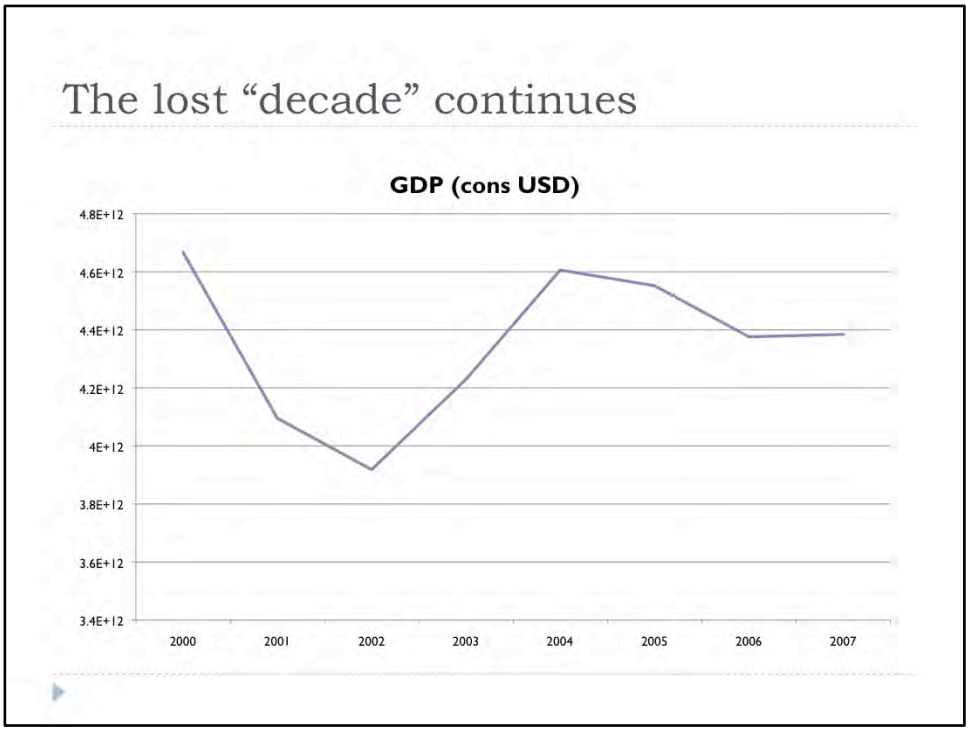


To hopefully convince you of this point, I will start by discussing Japan's old role as the "lead goose", driving Asia's economic development. I will then discuss why Japan is now viewed as more of a "wounded goose", surrounded by other rising geese. Then I'll present evidence that this view is fundamentally incomplete, basing my argument on four points: Japan's strength in key technologies, its attractive business environment, its central position in Asia and, lastly, that Japan's limitations are not immutable: many are fundamentally self-imposed and Japan has a demonstrated capacity to change. I will close by suggesting some of the roles that Japan can play within Asia's innovation infrastructure.



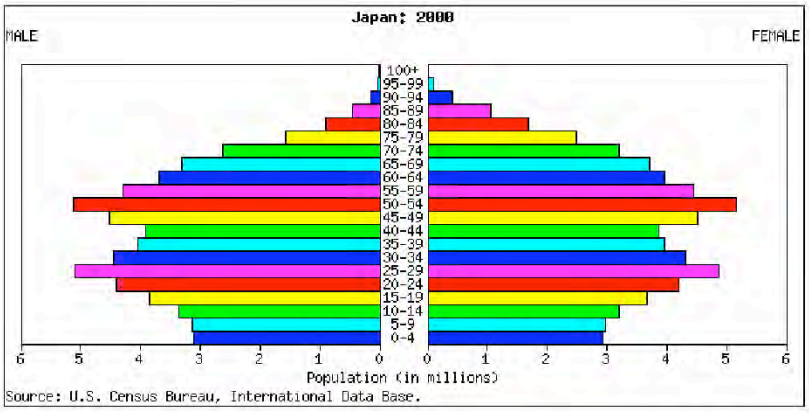
My title, of course, is a reference to the metaphor of Japan as the leading goose, driving industrialization in a hierarchically integrated East Asia. That vision actually goes back to the 1930s, with an more nuanced restatement in the 1960s. It was at least partially realized in the vast Japanese production networks that spanned Asia in the 1980s and 1990s.

Of course, no one talks about Japan as a lead goose anymore. It's not too hard to understand why. There are two reasons: Japan and the rest of Asia.

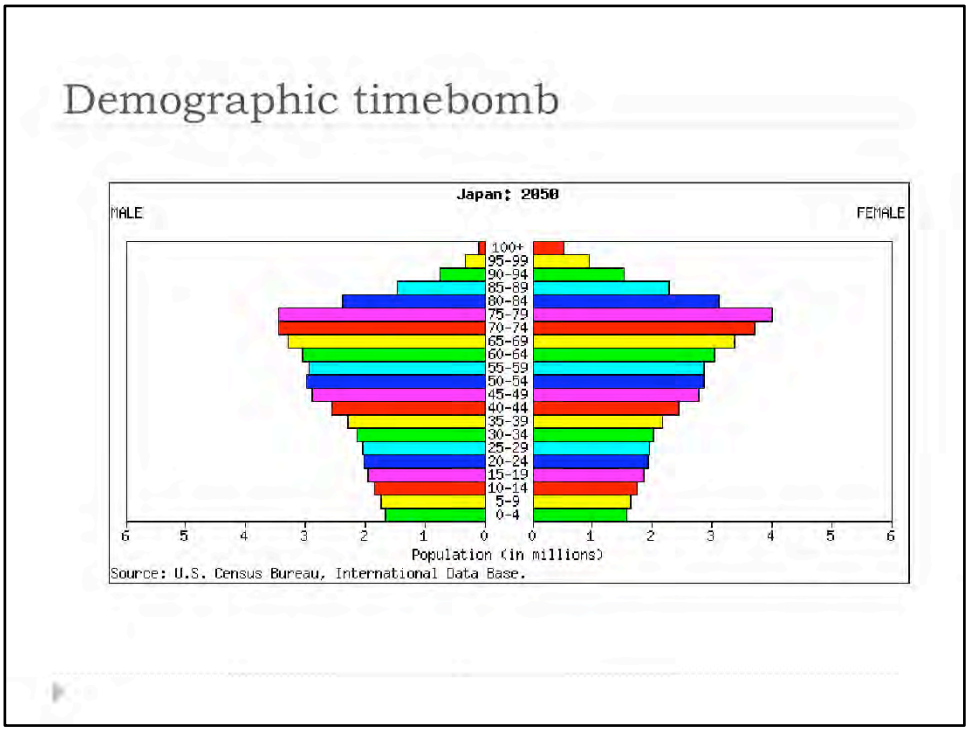


This is a graph of Japan’s GDP over the last seven years. The picture becomes even more uninspiring if you remember that these years are actually a continuation of the Lost Decade.

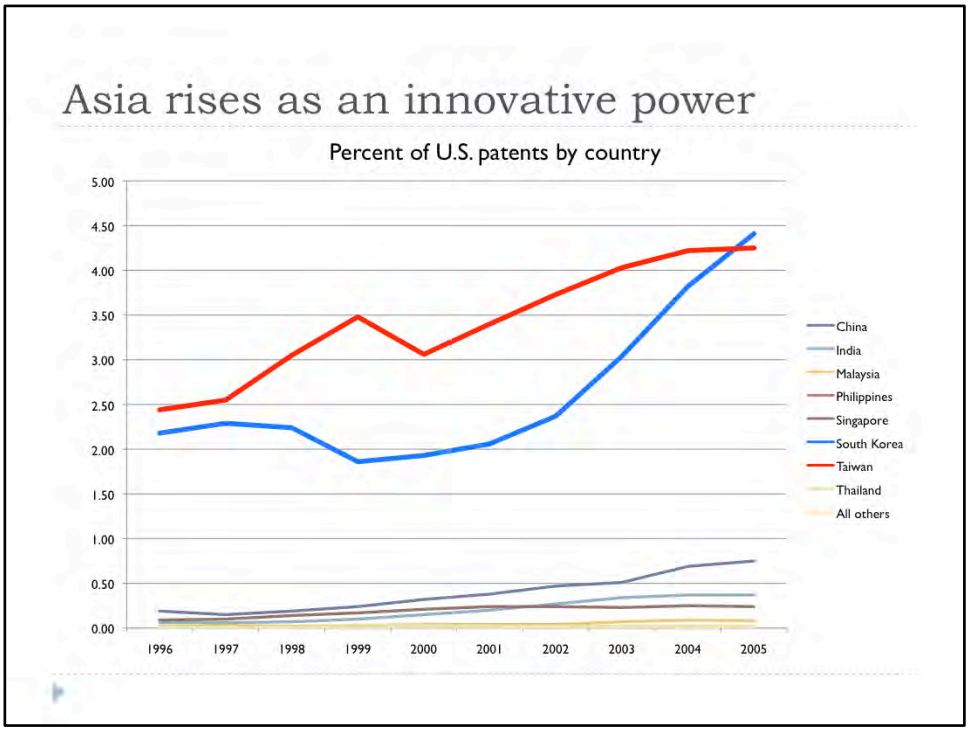
Demographic timebomb



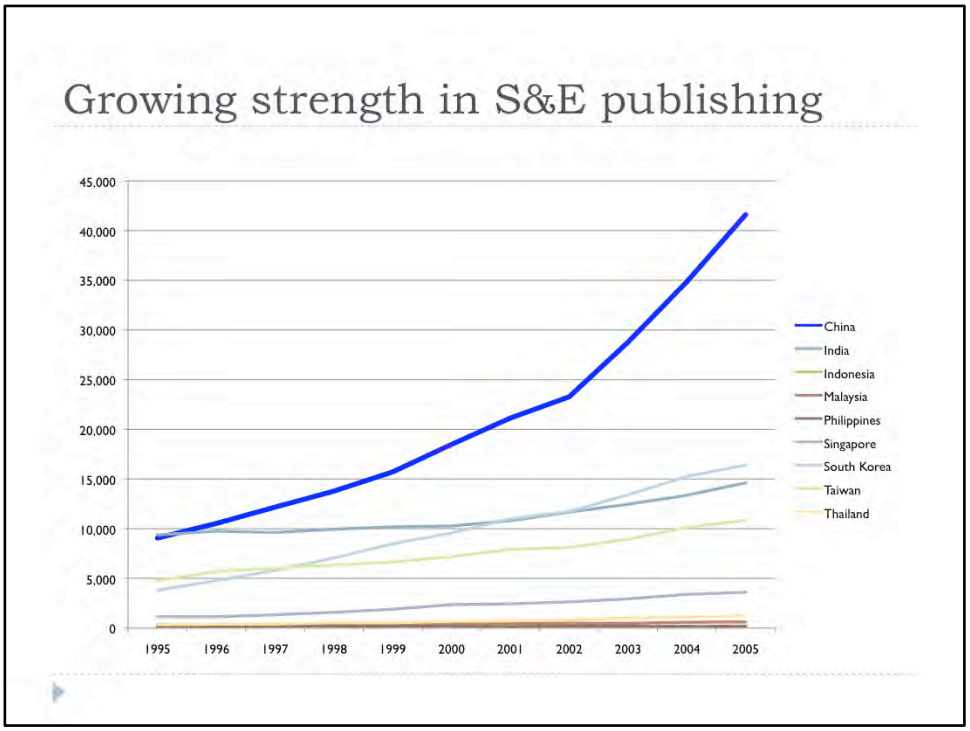
As poor as Japan's recent performance has been, the future is perhaps even more troubling. This is a population pyramid for Japan in 2000. As you'll see, there is a large bulge in the middle--people in their 50s.



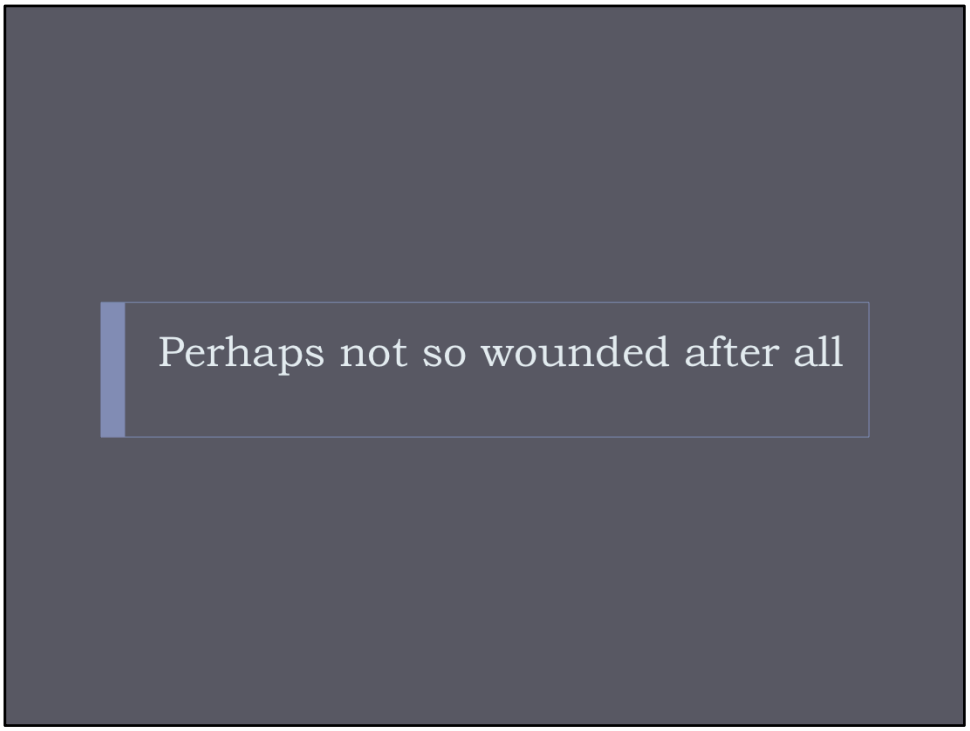
If you project forward 40 years, the pyramid turns on its head, with a large retired and aging population, supported by a small workforce. Hardly the setting for booming economic growth.



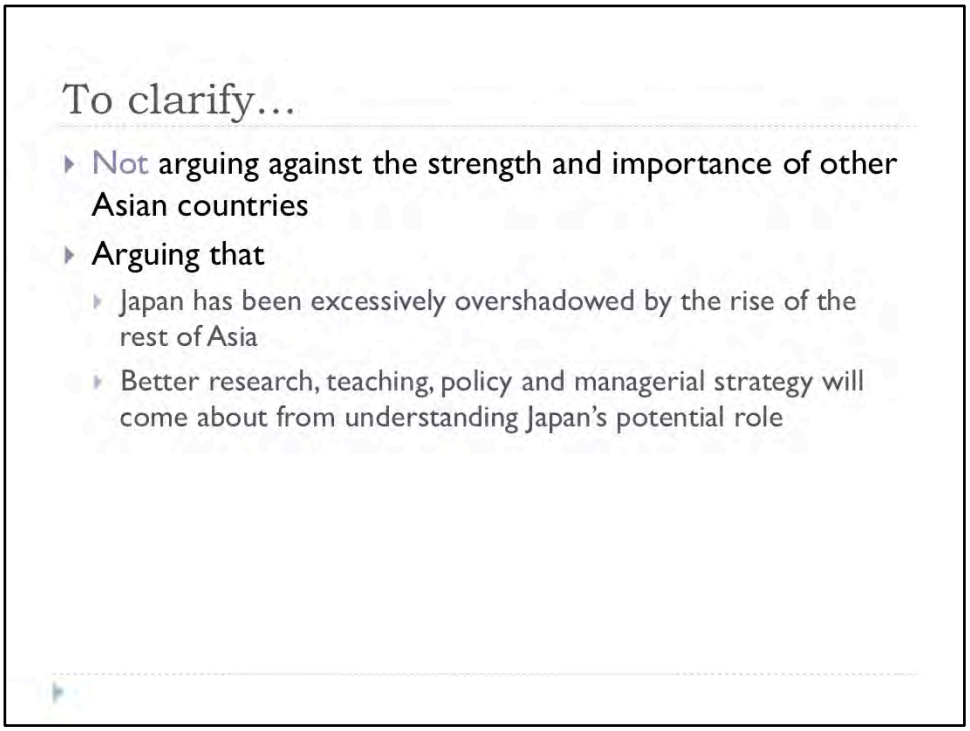
While Japan has been struggling, other countries in Asia have been surging. We all know about China's rise as an exporting super-power, but the changes go well beyond simple economics. This graph shows the percentage of U.S. patents coming from various countries. Over the last 10 years, you can see the dramatic growth of Taiwan and S. Korea's innovation. Other counties are also increasing and Asia outside of Japan now collectively constitutes just over 10% of all U.S. patenting—an impressive increase in the last decade.



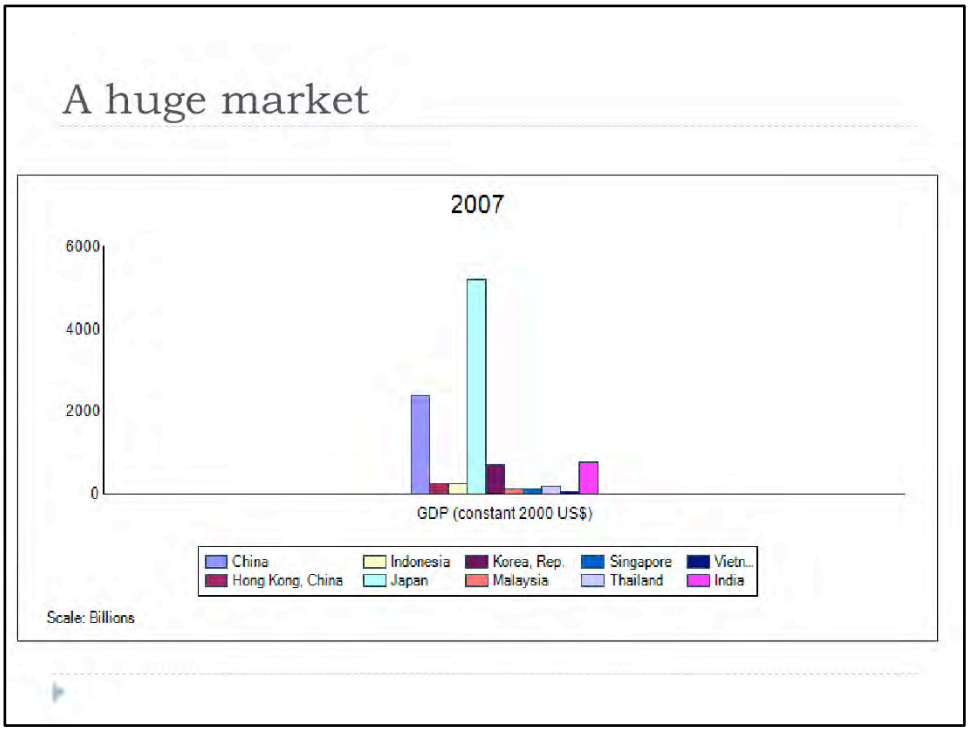
It goes beyond patenting to include more basic science, also. This graph shows the number of scientific and engineering papers published by country. China growth is amazing and other countries are also making steady gains.



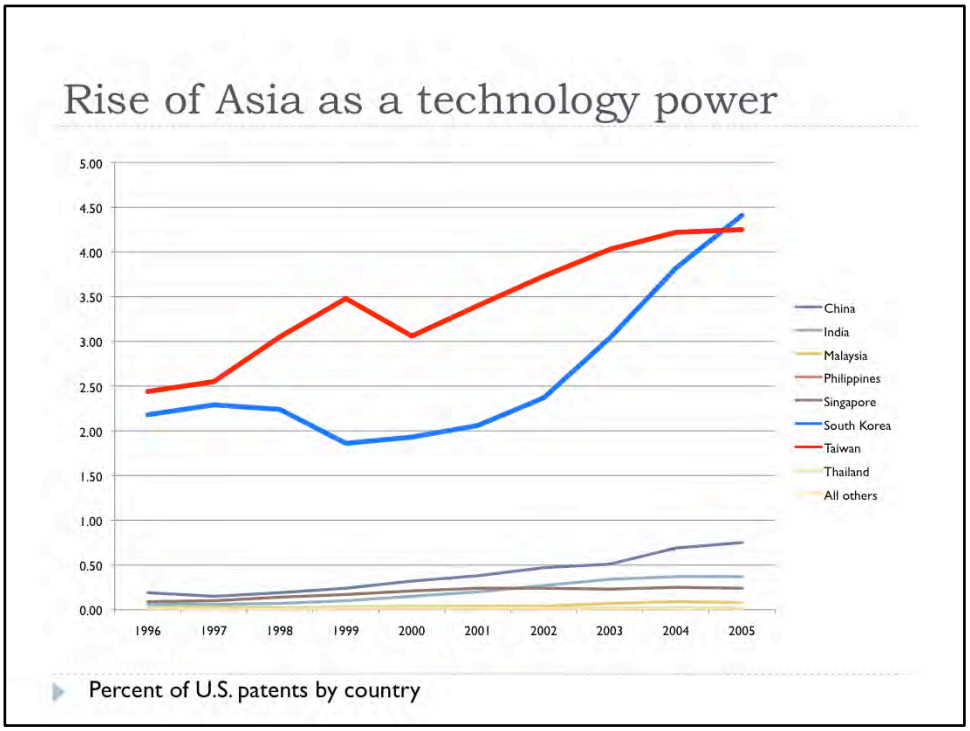
Given these changes, it makes sense that Japan is no longer discussed as the “lead goose”, when its even discussed at all. But I think that is a mistake—that Japan is not nearly as wounded as is popularly perceived.



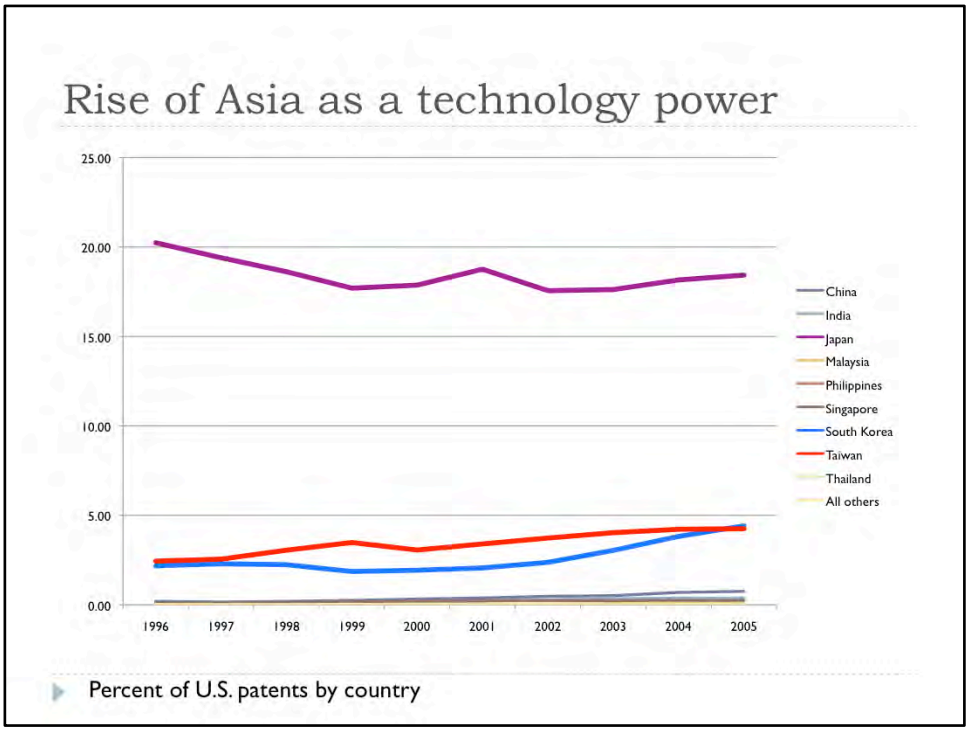
To be perfectly clear, I am not arguing against the importance of the rise of the rest of Asia. These are huge success stories. China and India in particular have tremendous economic and increasingly political influence on the world. Rather, my argument is that Japan has been excessively overshadowed by the rise of the rest of Asia.



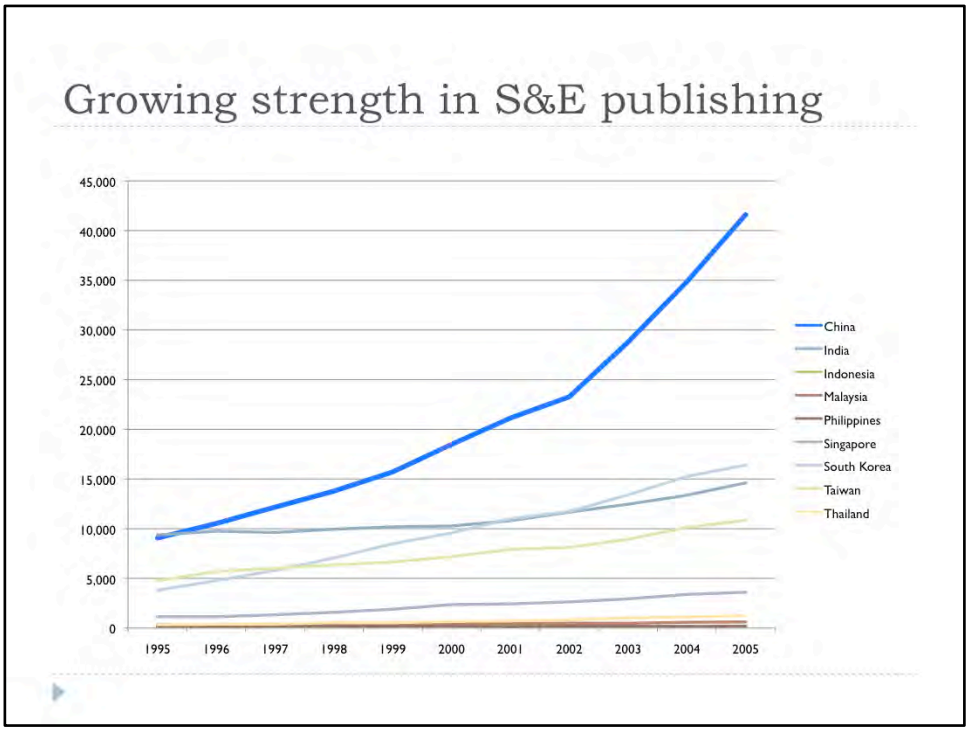
The first point worth noting is just how large Japan's economy is, relative to other Asian economies. Now, I think one can quibble with how the World Bank calculates China's GDP, but the fact remains—despite almost 20 years of poor Japanese performance and all of the growth that has occurred throughout Asia--the Japanese economy is huge in both relative and absolute terms. Japanese firms have within their borders a prosperous and highly sophisticated market.



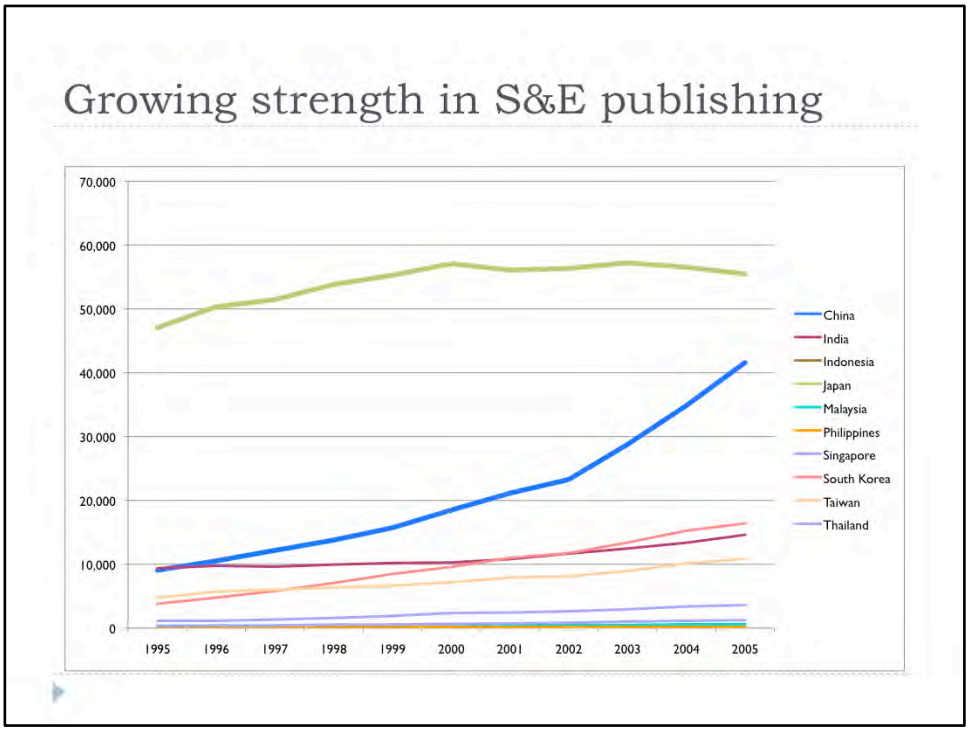
It's also worth putting some of the statistics I showed earlier in perspective. Remember this graph showing the percentage of U.S. patents from various countries?



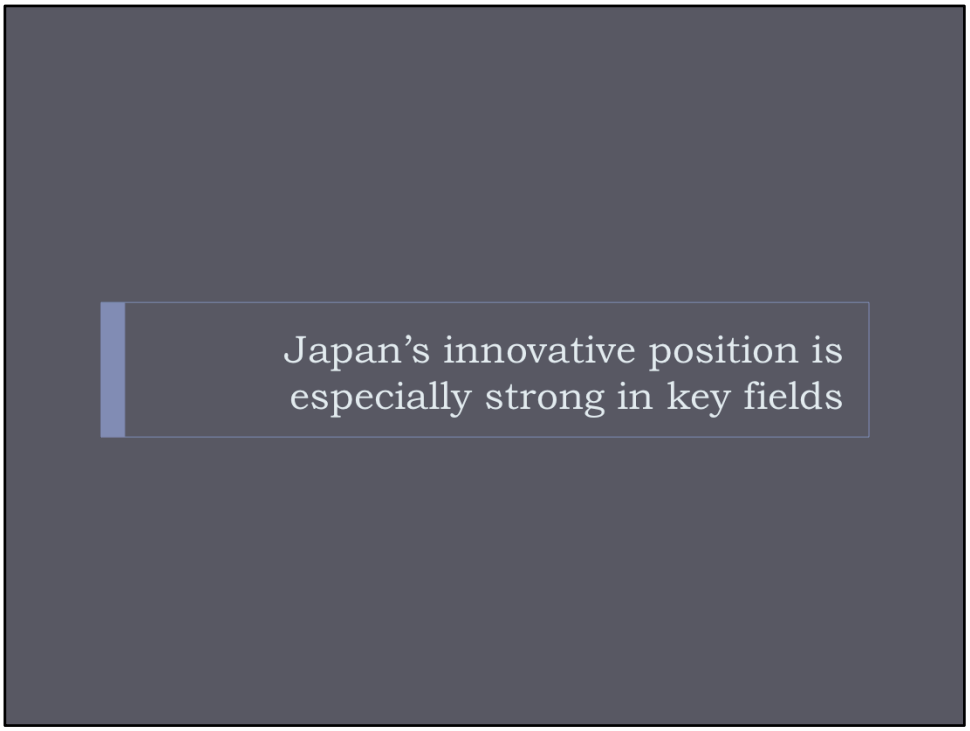
This is what it looks like when you add Japan. Despite the growth in innovation elsewhere, Japan still produces more U.S. patents than the rest of Asia *combined.*



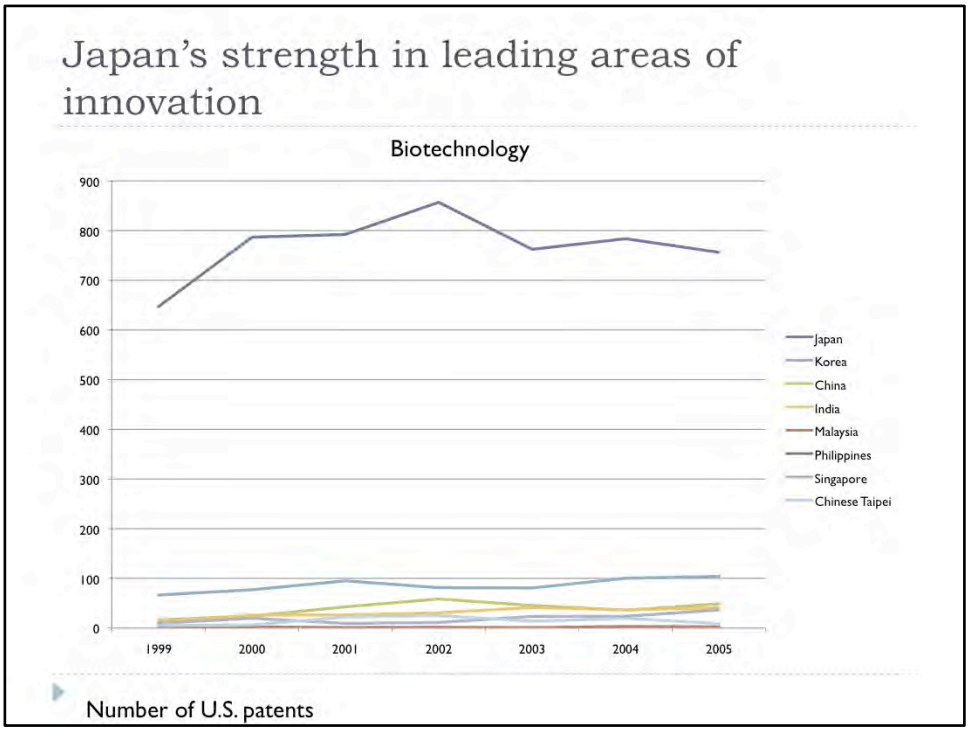
One sees a similar story, albeit less dramatically, if one examines the growth of scientific and engineering publishing. [Advance slide]



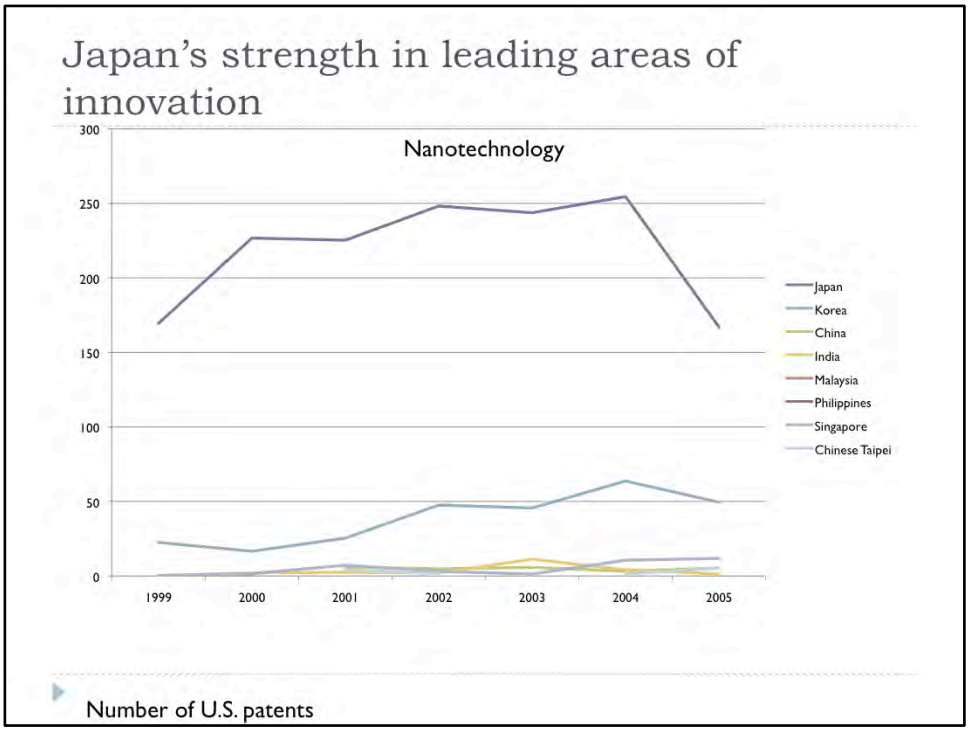
[Narration spans slides]



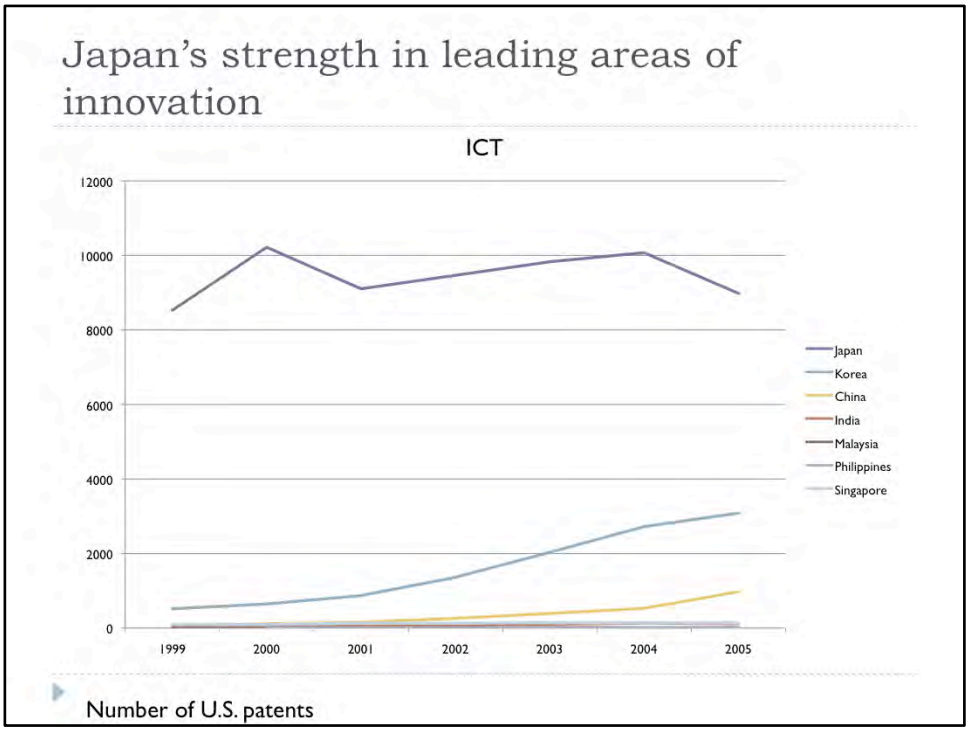
More important than just raw quantitative dominance in the production of patents and articles is Japan's strength in the fields that are commonly recognized as critical to future innovation. Consider the number of U.S. patents—an imperfect but broadly useful indicator of technological strength--held by Japan and other Asian countries in three critical fields.



This is biotechnology…

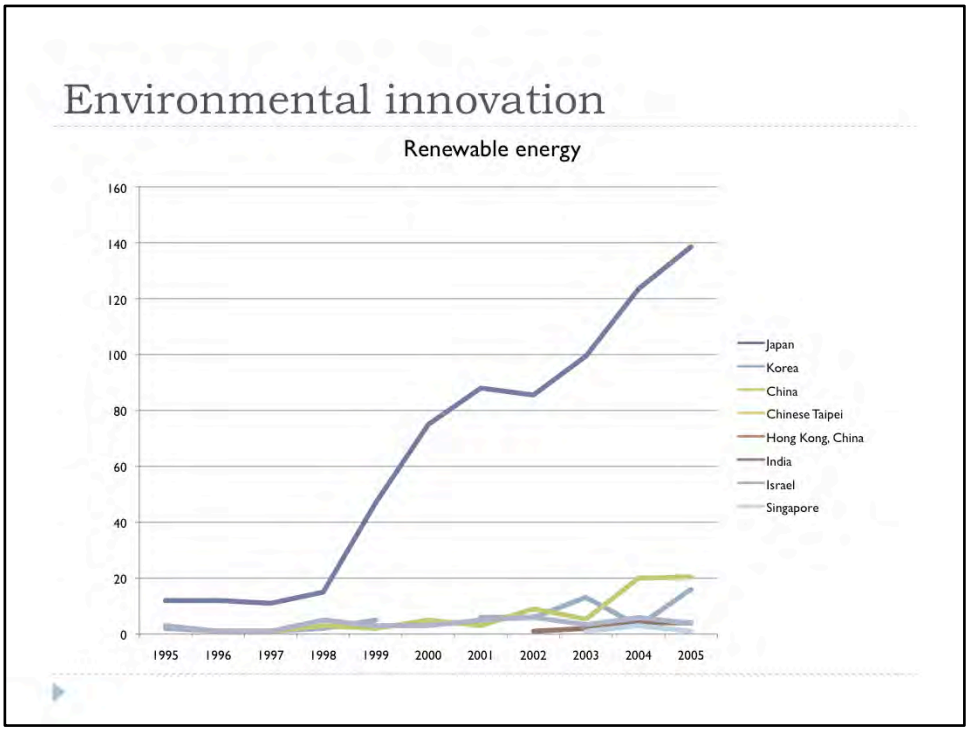


…Nanotechnology…

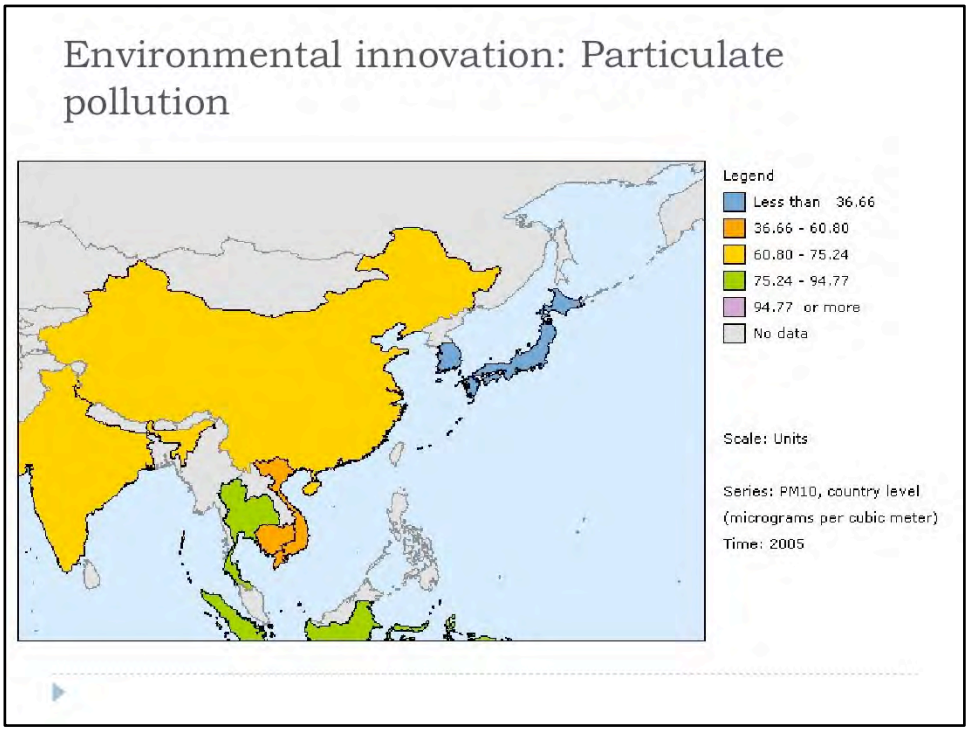


…and information and communications technology…

Japan's strength in each of these technologies individually is impressive, but—as you may know—much of the truly innovative technological advances are occurring at the intersections of these technologies. Consider, for example, nano-sized biosensors or bio-informatics. Japan has a distinct advantage in having strength across all of these fields and a proven ability to innovate where fields converge.



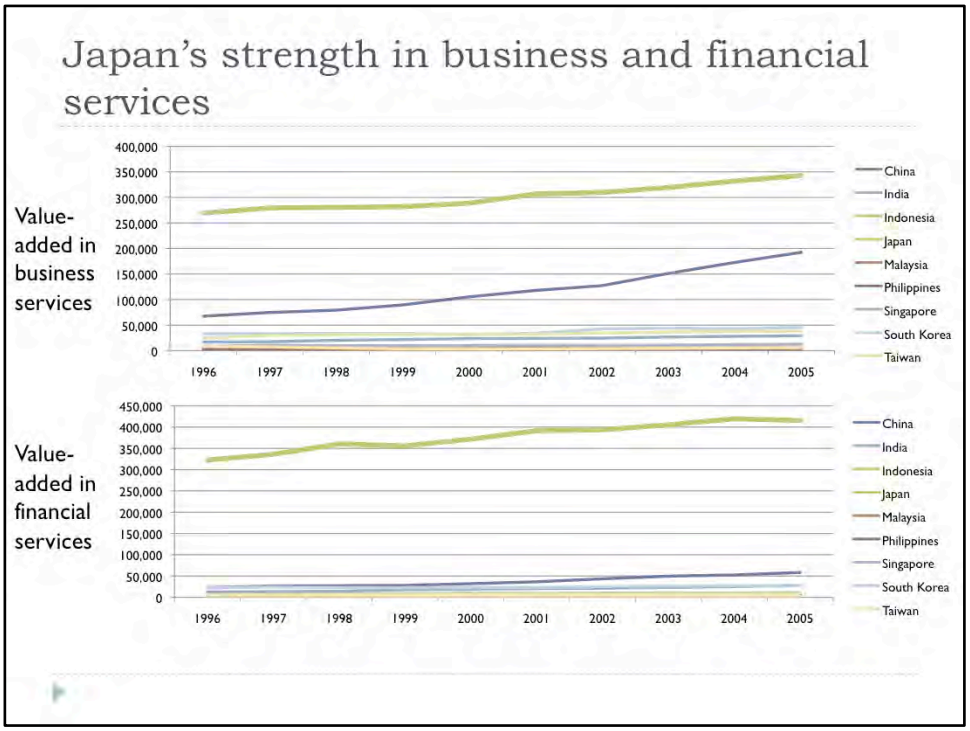
Let me spend a little more time on one specific technological area—green technology. If you've been in Japan recently, you can't help but be struck at the prominence given to green innovation and environmental sustainability. If you look at Japan's patenting in just one segment of this field—renewable energy—you'll see that Japan not only leads the rest of Asia, it's lead is rapidly expanding.



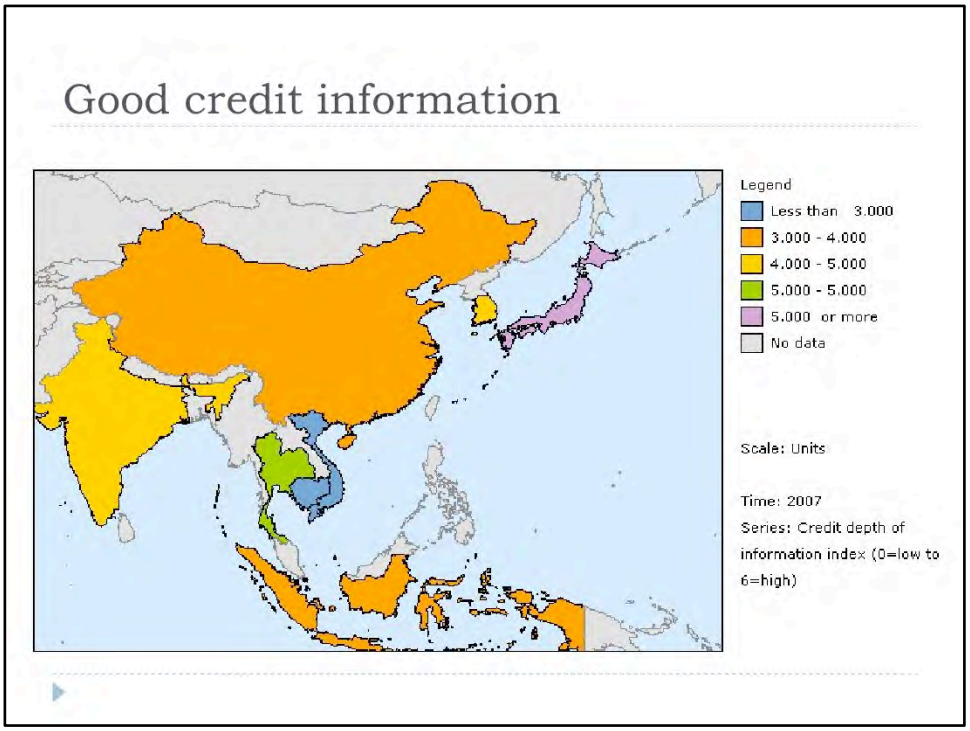
It's not just the creation of technology. Japan is also a leader in the application of green technology. Take, for example, Japan's success in pollution control. This map shows air pollution, specifically the density of airborne particulate's small enough to lodge in your lungs and make you sick—although the picture is the same for most measures of pollution. India's air is over 2.2 times more polluted than Japan's, China's 2.4 times. Other counties such as Indonesia are even worse.

What we've seen overall is that Japan is a regional technological leader in a sector that will see increasing demand throughout Asia.

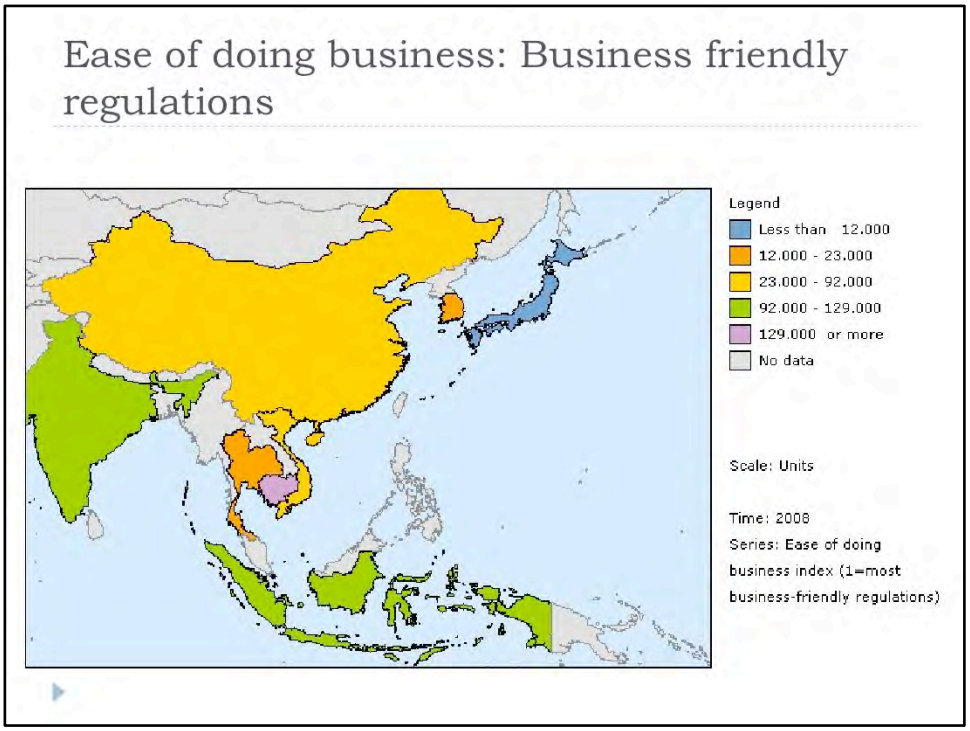
Of course, exploiting innovation requires a stable and sophisticated business environment. Here also, Japan is a regional leader.



If you look at the value added in both business and financial services, you'll see that Japan continues to lead the rest of Asia—indicating that Japanese firms have easy access to these critical resources. Interestingly, in 2006, the McKinsey Quarterly identified the financial system as an obstacle for development in China and India.

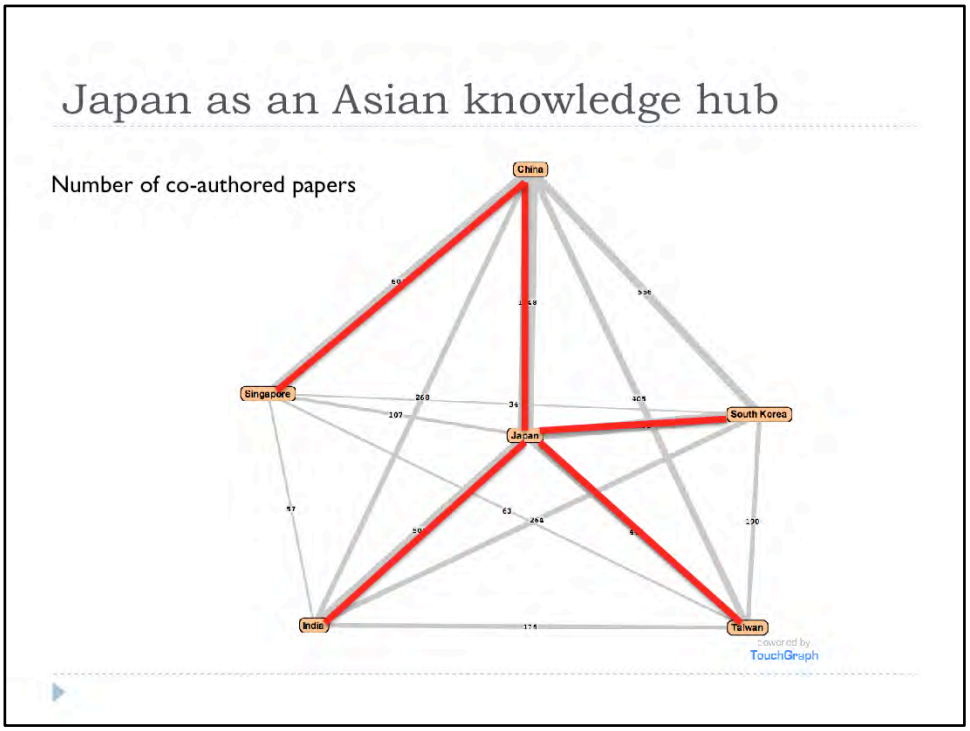


It is also much easier to get information on potential partners in Japan than elsewhere. On a scale of 1 (poor) to 6 (excellent), business people rated the depth of credit information available in Japan as five or better, while India was near 4, China near 3, and other important markets even lower.

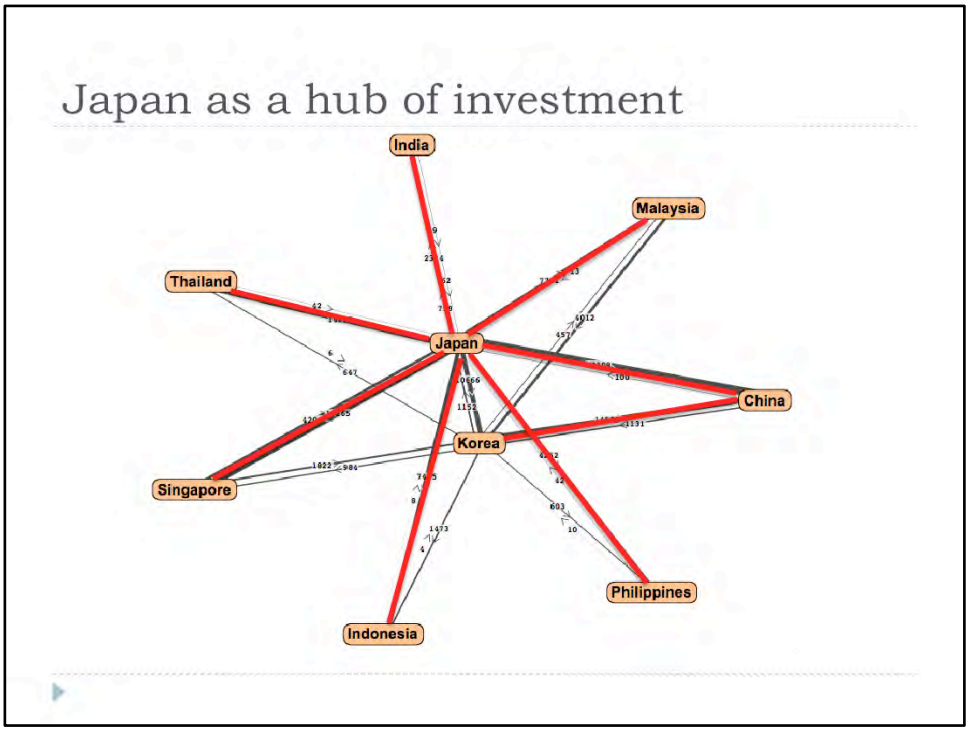


In a ranking of how business-friendly the regulatory environment was, Singapore and Japan were in the top 12 globally, S. Korea in the next 12, and every other country in Asia below that—most far below.

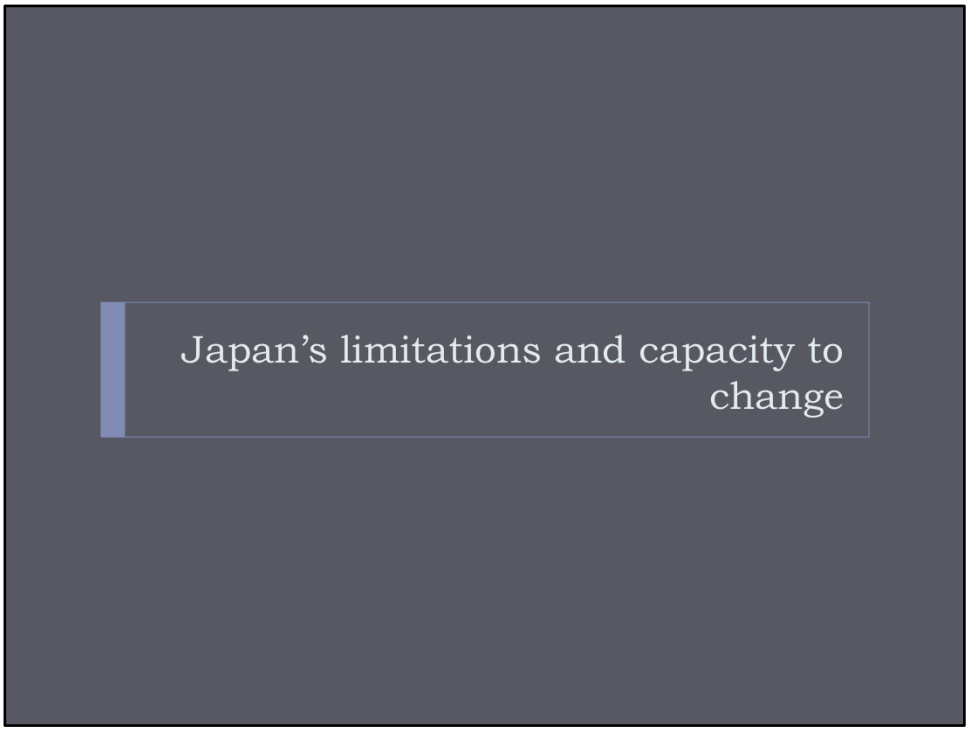
Japan combines this innovation and positive business environment with a central position within Asia. Not just geographically, although geography is important, but in the flows of knowledge and investment.



For example, consider coauthorship of scientific papers across countries. Japan is the leading Asian partner for China, South Korea, Taiwan and India. It is close second, behind China, for Singapore.

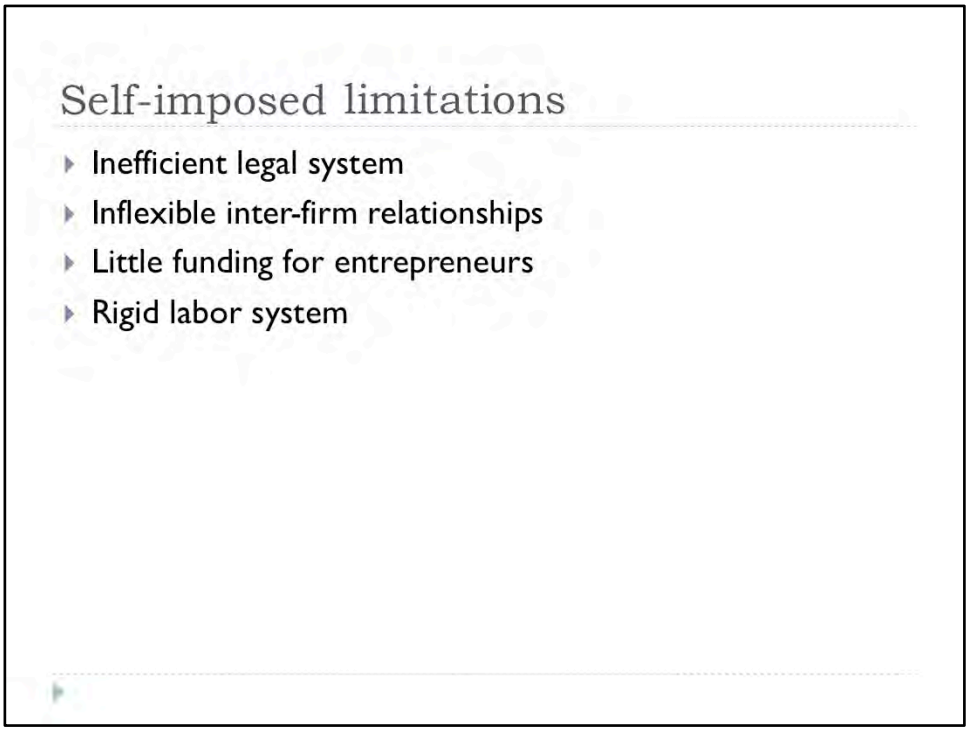


Japan is also central in the flow of investment and the economic and social ties investment forms. Japan is the leading Asian partner in bi-lateral investment for India, Malaysia, China, the Philippines, Indonesia, Singapore and Thailand. It ends up that there is marginally more Chinese investment in S. Korea than Japanese investment, but only by a small amount.



Given all of these advantages—innovation, a positive business environment, and centrality in the most economically dynamic region on earth—why has Japan performed so poorly?

Any student of the Japanese economy could give you long list off the top of their head.

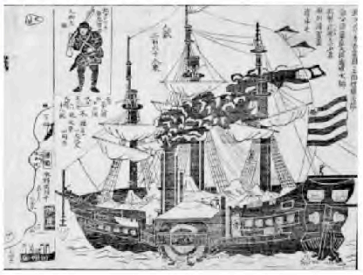


Four of the most commonly identified culprits are an inefficient legal system (something I've studied at length), inflexible ties between buyers and suppliers and among *keiretsu* partners, scarce funding for entrepreneurs, and a rigid labor system that discourages entrepreneurial risk taking.

Notice, however, that these are all to some degree within Japan's control. Japan can't do anything about its lack of natural resources, but it can improve its legal system.

Proven ability to change

- Meiji Restoration



History, of course, shows that Japan has the capacity to change dramatically in the face of external pressures. A classic example was the Meiji Restoration. After 250 years as a closed society and economy, Japan was confronted in 1853 by Commodore Perry's Black Ships arriving near Yokohama and demanding that Japan open itself to trade

Proven ability to change

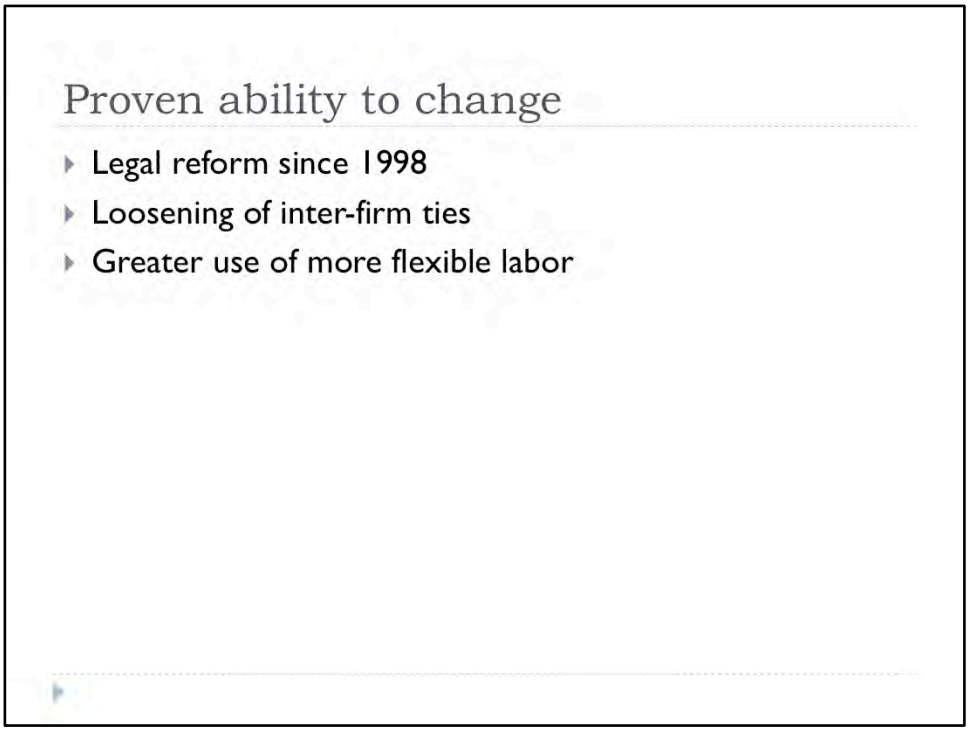
- Meiji Restoration

Year	Number of Steamships
1873	26
1894	169
1904	797
1913	1514

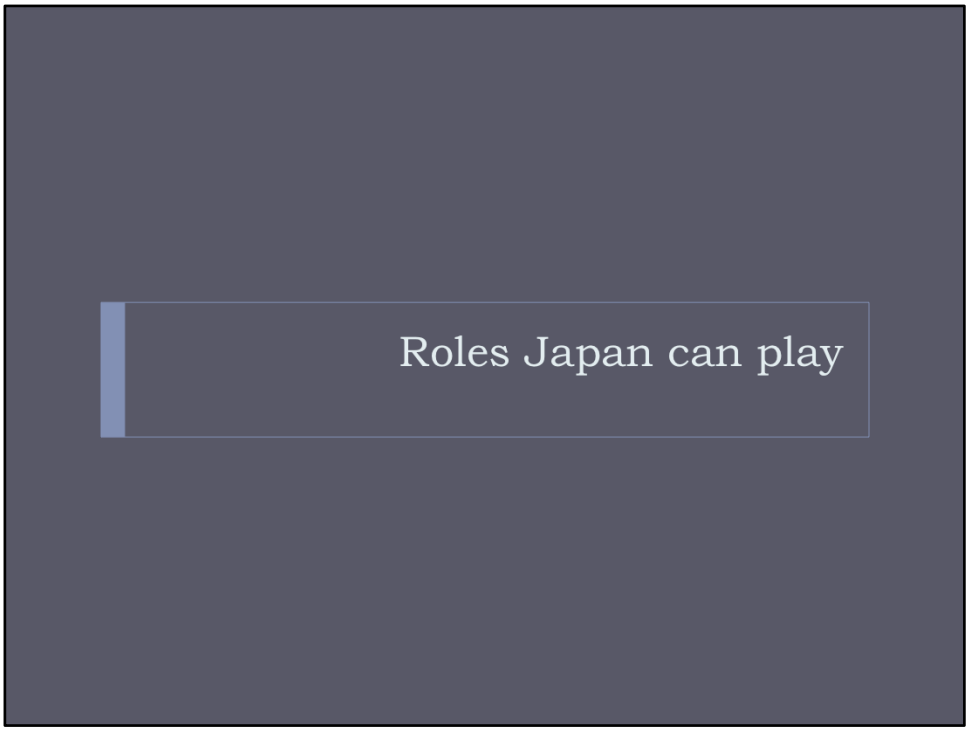
Year	Track (in miles)
1872	18
1883	240
1887	640
1894	2100
1904	4700
1914	7100

Year	Coal Production (metric tons)
1875	600,000
1885	1,200,000
1895	5,000,000
1905	13,000,000
1913	21,300,000

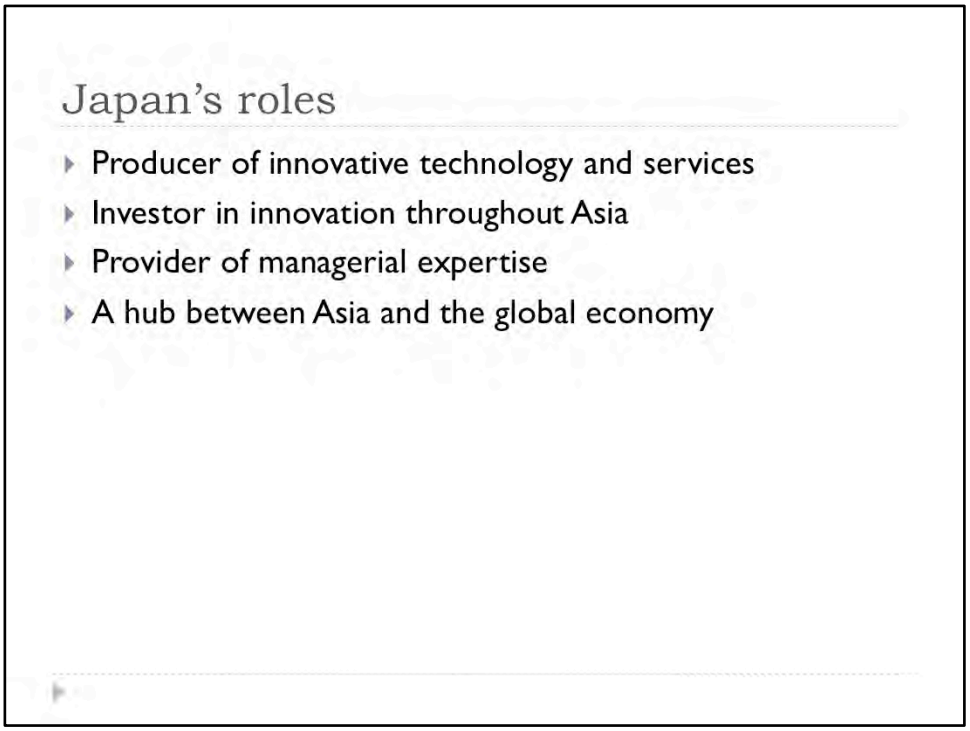
Soon after, Japan undertook a series of profound society, political and economic changes. Despite entering the industrial revolution late, it make amazing leaps forward, whether measured by construction of steamships, the laying of rail, the production of coal or almost any other measure.



Today's changes are perhaps less dramatic, but equally pervasive. Legal reform began in earnest in 1998, starting with the only instance I know of a major business organization telling the government that there needed to be more lawyers. Firms are loosening ties to weak suppliers and the labor force is becoming—slowly—more flexible.



Hopefully, I've convinced you that Japan still has a critical, albeit changed, place in Asia's innovation infrastructure. Let me close by suggesting some of the roles it can play.



First, Japan is clearly still the dominant producer of innovative technologies and services in Asia and probably will be for the mid-term future.

Japan also has the capital, experience and existing connections to invest in innovative projects throughout Asia.

Major Japanese firms also bring key managerial expertise in taking technology to product and in operating on a global scale.

Therefore, Japan is well-positioned to serve as one important hub between Asia's innovative potential and the global economy.

Thank you for your attention and I look forward to your comments and questions.