Book Review

The Atlas of Ideas: How Asian innovation can benefit us, Charles Leadbeater and James Wilsdon, Demos (2007), 52 pages, ISBN: 1841801747

South Korea: Mass innovation comes of age, Molly Webb, Demos (2007), 65 pages, ISBN: 1841801710

India: The uneven innovator, Kirsten Bound, Demos (2007), 65 pages, ISBN: 1841801712.

China: The next science super power?, James Wilsdon and James Keeley, Demos (2007), 68 pages, ISBN 1841801739.

"The Atlas of Ideas: How Asian innovation can benefit us" is a collection of four reports, each of which has a different ISBN. However it can be regarded as a single book since the series were planned under one umbrella project and shares a consistent framework to analyze the innovation system in South Korea, China, and India. Therefore it will be reasonable to regard the four reports as chapters in a single book for this review.

The 'us' in the title means the United Kingdom since the book was planned and written by Demos, "one of the UK's most influential think tanks" according to the book. They did the job to understand what kinds of innovative activities have been going on in three Asian countries and figure out ways to utilize them for the benefit of the UK. Despite of such a purpose, the content of the book is quite objective, informative and enjoyable.

Leadbeater and Wilsdon (2007) is the synthesis of the remaining three volumes. Why they are interested in innovation in Asia is because "the barriers to entry into scientific innovation" has been tore down by innovation centers and science parks in Asia. Even though Asian country speedily caught up with technologically advanced countries, it seems that there has been a general consensus that the levels of science in Asian countries except Japan are still far behind them. Considering the fact that science has been regarded as a fundamental foundation of innovation, especially disruptive ones, such observation tends to suggest that it will take a long time for Asian countries to catch up with advanced countries. However Leadbeater and Wilsdon (2007)'s observation is quite different from such judgment. They are observing that Asian countries are catching up fast in science as they did in technology.

The book does not follow the traditional perspectives on Asian innovation. Instead of looking for a uniform Asian innovation model, the book argued that "There is no Asian innovation model; there are several (p.13)." Therefore, the book treats each country distinctively.

Leadbeater and Wilsdon (2007) mainly focused on three things in explaining the emergence of Asian science: human capital, international networks, and role of the state. There are two kinds of human capital; one is domestically trained and the other is foreign-trained. India and China are quite strong in terms of the numbers of graduates majoring in science and engineering but there are weaknesses in the system according to the book. One is that the quality of the graduates is not homogeneous since only a handful of universities are rated as top-tier research universities. The other problem is that many of the smartest

graduates tend to leave for foreign countries, especially the United States, which is called as a brain-drain.

However, what makes the emergence of Asian science possible is the home-coming of scientists and engineers according to the authors, which was called as brain circulation by Saxenian. Apparently scientific knowledge embodied in them benefits their home countries when they come back. But more important asset they bring with them is the networks with scientific communities with scientifically advanced countries, which make the circulations of scientific knowledge faster and international collaboration much easier,

There are many reasons for the development of science in Asia but one of the most influential factors is the repatriates from scientifically advanced countries. Then what brings them back? Leadbeater and Wilsdon (2007) points out three factors: "fast-growing markets, plentiful state funding for research, and middle-class lifestyles in increasingly cosmopolitan cities."

Leadbeater and Wilsdon (2007) argued that "our hubs of scientific innovation, in London, Cambridge, Oxford and Manchester, should attract inflows of talent from around the world, just as the City of London has (p.11)." This is in line with the main argument of Florida (2004) and Lee et al. (2006), which emphasized the importance of habitat attracting diverse talent. Regarding talents, they paid attention to the sheer size of scientists in China and India who came back from scientifically advanced countries and those returners are welcomed and received various support by state.

What set Asian innovation model apart from others is the aggressive role of the state in promoting innovation. South Korea and China fit this model very well since both countries are investing in science to use it for an engine for economic growth. But India shows somewhat different picture compared to South Korea and China. It seems that it is rather de-centralized and the state power in India is not as strong as South Korea and China, which supports the variety of Asian innovation model.

There are several points to be improved in the book. The first is the lack of a clear separation between science and technology. The second is that this is no clear explanation on why they picked up South Korea, India, and China. South Korea is quite different from India or China in terms of various aspects, especially size.

South Korea

Webb (2007) investigated the innovation system in South Korea based on official documents and government plans. In addition, she did five weeks fieldwork in South Korea and interviewed over 70 experts. It seems that major part of the insights relies on such interviews.

Webb (2007) argued that one of the characteristics of South Korea is active intervention of the state in promoting science and technology and it seems it works well to some extent. The report started with the case of Woo-Suk Hwang, who was once a scientific superstar but became guilty of faking data and unethical research activities. Webb (2007) interpreted Dr. Hwang case as a symbol of "scientific techno-nationalism", which is the extension of "industrial techno-nationalism." It showed a potential as well as a limit of science promotion projects led by South Korean government.

The analysis is well summarized in the end of the report. Webb (2007) came up with six strengths and six weaknesses out of careful analyses. The first of the strengths is strong government support. South Korean government has been dexterous in planning and intervening in the market to promote industry and science. Excellent infrastructure especially in IT areas is one example for future development. The second is the leading role of private sector in investing in R&D. 75 percent of total R&D in South Korea is invested by private sector, which is much higher compared to India and China.

They tend to be more focused on applied research while government R&D tends to concentrate on basic research. The third is well educated talent. Since about 85 percent of high school graduate proceeds to tertiary education, South Korea is well equipped with well-educated talent pool. The fourth is well-established international link. About 10 percent of Koreans live abroad and a large portion of top students has gone to foreign universities, especially the United States.

The fifth is stable democratic system. Different from China, South Korea smoothly transited from military autocracy to democracy system and has enjoyed a stable political system since 1987, which promotes more creative environments and entrepreneurship. The final is South Korea's capability to turn crisis into opportunity, which is well supported by overcoming the Asian Financial Crisis in 1997 and the Global Financial Crisis in 2008.

Also six weaknesses are listed. The First is the lack of attraction as a destination for FDI since South Korea is comparatively nationalistic compared to other countries. The second is the weak links among players in innovation systems. Especially the link between business and academy needs to be strengthened. The third is the low levels of trusts in Korean society. The fourth is the quality of college graduates. Although a high percentage of high school graduates proceeds to college, they tend to stick with "rote learning." Webb (2007) reports that "Korea wants to become an innovative society but its educational institutions and culture are still heavily slanted towards industrisation" (p.25). The fifth is the weakness in basic research. Traditionally South Korea focused on applied research and development, which resulted in poor investment and infrastructure for basic research. The last problem is that South Korean government has gotten used to over-planning. One of the problems is the frequent change of government policies and plans. Another is the duplicative policies among various departments. Webb (2007) reported that "one of the most frequent criticisms of the Korean system is not that it is planned but that on the contrary there is too little strategy and too much duplication between competing ministries and plans."

It is quite interesting to observe that Webb (2007) paid close attention to cultural issues related to science and openness. After discussing the issue related to professor Laughlin, a Nobel Laureate and ex-KAIST chancellor, Web (2007) concluded that "His story (Professor Laughlin) is also further proof that Korea will not be able to rely on star individuals or quick fixes for systemic problems" (p.25). It takes considerable amount of time to change culture and it often creates serious conflicts with a shorter time horizon of a five-year single-term president in South Korea.

India

Bound (2007) investigated India as a candidate for the next giant in the world of science. It is a daunting task to come up with a concrete report on India in about sixty pages. However the report looks quite well organized and informative. If two words can be picked up to describe India innovation system, one will be science nationalism which can be exemplified by space programs and nuclear programs. The other is the success of software industry which benefited from expatriates from advanced countries and boasts extensive international networks. Both shows accomplishments as well as limits of Indian innovation system.

Bound (2007) listed eight strengths and weaknesses. The list of strengths included political stability sustained by democratic systems which works as a "counterpoint to China." The size of talent is strength but it is somewhat doubtful whether top quality of science will come out of this mass of talent pool. Numerous global players are running R&D centers in India and can expect spillover effect out of them. Also it is important that India already experienced a success story in global markets: software industry. They might use the success experience and replicate it in other sectors such as pharmaceutical industry.

Some aspects of strengths can be interpreted as weaknesses at the same time. The list of weaknesses included out-dated infrastructure, incompetent governing systems, possible instability caused by inequality, and uneven quality of students. Although IIT is well known in the world and the graduates from IIT are sought after, Bound (2007) is skeptical of IIT as a research hub by arguing that "IITs are not prolific centres of research. They do not produce new inventions, and they do not excel in creating spin-off companies. IITs succeed because of the sheer quality of the undergraduates they produce (p. 16). Also the share of private R&D is quite small and about 60 per cent off government R&D is spent for defense (p.14). The diffusion networks which can benefit from defense R&D are quite weak in India. Bound (2007) argues "The (IT) industry has grown up serving foreign multinationals, creating few of its own products, brands and relatively little intellectual property. Infosys spends

only 1 per cent of its sales revenue on R&D" (p. 34).

Ironically, the sheer number of people is one of the strengths India has but there is a shortage of skilled people. Since IT sector is booming, most of top students are dedicated to the IT sector and little of them are available for other science research. Also it was concerned that the US-educated are better treated and the India-educated is treated as the second-graded, which resulted in hierarchy in science.

Multinational R&D centers might not be beneficial as expected. Bound (2007) pointed out that "..multi-nationals can be bad news for the Indian public sector. Disconnected locally but connected globally… worry about little knowledge spillover" (p.36).

China

Wilsdon and Keeley (2007) analyzed the innovation system in China and found the huge potential to be the next giant in science. Such conclusions came from the sheer size of scientists and publications under the effective control and guidance of Chinese government. Compared to India, Chinese government showed their dexterity in planning and mobilizing resources in catching up with advanced countries. As acknowledged in the report, it is a very difficult task to investigate China in a single report but the report came up with an objective and insightful analysis.

Another advantage is that China has extensive networks with science communities of advanced countries. Thanks to the "seaturtles" who came back from foreign countries, China cultivated a good relationship with the U.S. and European institutions and strengthened its own research capability as evidenced by the fact that some of Chinese universities at the top end reached the world class.

However, there exist weaknesses in Chinese innovation system. China is quite spiky in terms of capabilities for science and technology as well as economic equity, which might create instability in China. In addition, Chinese companies invest very little in R&D, which may drag the development of industries in future. The quality of human capital was also pointed out. Since Chinese education system is not encouraging creativity and openness, China may not fulfill the potential of its human capital.

Culture was also mentioned. China greatly benefited from opening its market by attracting numerous multinational R&D centers and "seaturtles." However, it may change since there are some discrimination against "seaturtles" and increasing scientific nationalism, which is closely related with Chinese political system. Compared to South Korea and India, the governance structure in China is not as open as South Korea. Especially censorship on the media might undermine the development of science.

As discussed, it is a very daunting task to compare three countries but this series of reports had done it elegantly. Especially it is more insightful since the series is the results of diligent and professional field works by the authors.

It has the following limitations. The first is its theoretical framework. Webb (2007) and Bound (2007) provided two figures: <Figure 8> in Webb (2007) and <Figure 10> in Bound (2007). It would be more interesting if such frameworks are more discussed in the earlier chapters or Leadbeater and Wilsdon (2007) in detail. Without such theoretical framework, some readers might get lost among numerous quotes and observations. The second limitation is to put South Korea, India, and China in the same basket. Although Leadbeater and Wilsdon (2007) argued that there is no single Asian innovation system, it is still not clear how insightful it is to compare South Korea to India and China. Since South Korea resembled the Japanese innovation model, it would be interesting to compare South Korea to Japan. The third, it seems that Webb (2007) is overly influenced by Hwang's case. It is understandable since the fieldwork period was right after Hwang's case and interviews with Korean scientists were heavily influenced. However, it is now quite surprising to observe how quickly South Korea put Hwang's case behind and moved forward after. The fourth is that the data used in the series is somewhat outdated, which is not the fault of the series since it is reviewed in 2011. But the fast-changing nature of Asian countries shows the dynamics of those countries, which is the topic of the series.

Overall the series on Asian innovation is quite

insightful and very kind to readers. Often the views by outsiders provide more objective views on us. The series might be the case.

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