〔論　説〕

Urban Turn of Innovation Clusters and the Okinawa Institute of Science and Technology (OIST)[1]

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1. Introduction

A most notable feature of current economy is the emergence of a "learning economy,"[2] not only within a limited number of developed countries but also on a global scale. In such an economy, continuous innovation is a main source of strength.[3] Intensified competition is not only destructive to the existing economic structure but also functional for alternation of its generations.[4] From a perspective of evolutionary economic biology, today is cognate to the Jurassic era, approximately from 200 million years ago to 145 million years ago, when great out-

1　This paper was read on the occasion of the conference on "Innovation as a Factor in the Development of the Asia Pacific Region," on November 19, 2012, held by the University of Economics in Wroclaw. The author expresses his gratitude to Professors Elżbieta Czarny, Boguslawa Drelich-Skulska, Ewa Oziewicz, and Jan Rymarczyk for their valuable comments.

2　OECD has stressed the move towards a "knowledge-based economy." Every economy should be based on some knowledge, so that "knowledge-intensive economy" is more accurate description. For capturing the dynamics of knowledge creation and transmission today, it is more appropriate to call it "learning economy." *See* Bengt-Åke Lundvall & Daniele Archibugi, *Introduction: Europe and the Learning Economy, in* THE GLOBALIZING LEARNING ECONOMY 1 (Daniele Archibugi & Bengt-Åke Lundvall eds., 2001).

bursts of variety enriched the species and intelligent life was selected as higher form of animals.[5] After hierarchical capitalism whose centers were big companies, "alliance capitalism"— or "relational," "collective" or "collaborative" capitalism— has been emerged world-wide, whose distinctive feature is the growing extent to which the stakeholders need to collaborate more actively with each other in order to achieve innovation.[6]

As for innovation, the dominance of the United States seems to be enhanced. Especially, Silicon Valley, a region in California to the south of San Francisco, has become a model of innovation clusters,[7] which has

3 The concept of innovation has been coined by Joseph Schumpeter, being differentiated from invention. *See* Margaret B.W. Graham, *Technology and Innovation, in* Business History 347, 348 (Geoffrey Jones & Jonathan Zeitlin eds., 2007). It is a fuzzy concept, so that we should be cautious in the evaluation of innovativeness. For example, it is pointed out that the number of patent, especially issued in such a country as the People's Republic of China (PRC), may play limited role as an indicator of the place of innovation. *See* Xuan Li & Yogesh A. Pai, *The Changing Geography of Innovation Activities: What Do Patents Indicators Imply?, in* The Rise of Technological Power in the South 69 (Xiaolan Fu & Luc Soete eds., 2010).

4 *See* Gerd Schienstock, *From Path Dependency to Path Creation: A New Challenge to the Systems of Innovation Approach, in* Embracing the Knowledge Economy: The Dynamic Transformation of the Finnish Innovation System 3, 8 (Gerd Schienstock ed., 2004).

5 *See* Philip Cooke, *Introduction: Regional Asymmetries, Knowledge Categories and Innovation Intermediation, in* Regional Development in the Knowledge Economy 1, 16 (Philip Cooke & Andrea Picaluga eds., 2006). As for the variety of organisms, for example the Mesozoic larger benthic foraminifera, *see* M.K. Boudagher-Fadel, Evolution and Geological Significance of Larger Benthic Foraminifera 203–06 (2008) (noting that, despite the unfavorable living conditions for benthic foraminifera, the number of forms going extinct is low, with new forms appearing. Extinction may have occurred in enclosed, stagnated basin-environments).

6 *See* John H. Dunning, *Regions, Globalization, and the Knowledge Economy: A Neglected Factor?,* 29 J. Int'l Business Stud. 45, 48 (1998).

7 Innovation cluster is sometimes called as a "creative region." *See* Graham, *supra* note 3, at 359–60.

three characteristics of entrepreneurial business models: management of high-risk finance, development of human resources within a competency destroying environment, and creation of sufficiently high-powered motivational incentives for personnel.[8] Silicon Valley itself has been internationalized, as well. Today, half of the start-ups in Silicon Valley are foreign-born entrepreneurs.[9] The increasing internationalization of the labor market of highly skilled workers in information and communication technology (ICT), along with the fixation of English as common language, is favoring and will continue to favor the United States.[10] Talented young people throughout the world might have a desire to study at the U.S. universities and stay there to realize their "American dreams." Many countries have been trying to create their own "Silicon Valleys."

Japan is said to be good at process refinement. For example, an incremental improvement of manufacturing process based on the experience of the workers on site, called "Kaizen" in Japanese, contributed to make Toyota Motor Company one of the most successful companies.[11] However, the Japanese big companies, including "aging tech giants" such as Sony and Panasonic, have not been able to catch up with the transformation from the industrial economy to the learning economy, probably because of the inertia, i.e. hyper-stability. Faced with a threat of fundamental change, people often develop cognitive rigidity, deny-

8　*See, e.g.,* Steven Casper, *Varieties of Capitalism and Innovation: The Silicon Valley Model, in* Creating Silicon Valley in Europe: Public Policy Towards New Technology Industries 15, 20–26 (2007).

9　*See* Guy Sormon, The Silicon Lining; California's Innovative High-Tech Forms Keep Crreating Wealth, but will Bad State Policies Drive Them out?, Wall Street Journal, May 29, 2010.

10　*See* Nigel Kendall, Rewards and More; Attaching and Retaining Workers with the Requisite Expertise Has Never Been so Difficult, or Critical, to Business, Wall Street Journal, June 29, 2011.

11　"Kaizen" is so popular a word that, when one searches "kaizen" in the collection of the libraries at Harvard University, he or she may find as much as 173 books.

ing the need for renouncing the old strategies and searching for totally new ones.[12] In particular, the stability of scientific institutions and the mental inertia of highly specialized scientific communities cannot be underestimated.[13] In many cases of Japanese companies, such general phenomena of inertia might be amplified by the past experience of success.

As a result, the Japanese companies have become notorious for their weakness in innovation.[14] Japan slipped to No. 25 in the Global Innovation Ranking 2012 published by INSEAD and World Intellectual Property Organization (WIPO), falling out of the top 20 for the first time since the survey began in 2007. Japan is ranked behind such countries and an economy in East Asia as Singapore (No. 3), Hong Kong (No. 8) and Republic of Korea (South Korea) (No. 21). New Zealand (No. 13) and Australia (No. 23) are ranked ahead of Japan as well.[15] It is estimated that the working population involved in entrepreneurship in Japan stood at 3.3 percent in 2010, the second lowest rate in the indus-

12 *See* Audley Genus, *Understanding Inertia: Developing a Multi-Disciplinary Perspective?, in* STRATEGY AND PERFORMANCE: ACHIEVING COMPETITIVE ADVANTAGE IN THE GLOBAL MARKET PLACE 203, 209 (Abby Ghobadian et al. ed. 2004).

13 *See* Schienstock, *supra* note 4, at 12.

14 *See* JOSEPH HUBER, NEW TECHNOLOGIES AND ENVIRONMENTAL INNOVATION 333 (2004).

15 *See* INSEAD & WIPO, Global Innovation Index 2012: Stronger Innovation Linkages for Global Growth, at xviii, available at http://www.wipo.int/export/sites/www/freepublications/en/economics/gii/gii_2012.pdf. East Asia in a narrow sense may include People's Republic of China (PRC), Japan, Republic of Korea and ten countries of the Association of Southeast Asian Nations (ASEAN). These 13 countries have a summit meeting called ASEAN Plus Three (APT). East Asia in a broader sense may include Australia, India and New Zealand in addition to these 13 countries. These 16 countries had a summit meeting called East Asia Summit (EAS), to which Russia and the United States have become members in 2011. The Japanese government endeavors to make Okinawa as a hub of logistics in East Asia. Therefore, the relative strength of the economy of Okinawa has a significant meaning for the Japanese foreign policy.

trialized world following Italy (2.3 percent). In contrast, the equivalent ratio in the United States was more than twice, i.e. 7.6 percent.[16] One of the primary reasons of the recent deterioration of the competitiveness of the Japanese companies in today's settings, which has resulted in so called "lost two decades of the Japanese economy," can be found in its lack of enough competencies in innovation.

The Japanese government cannot be an idle spectator of such degradation of the Japanese economy. Among various policies to revitalize and activate the Japanese economy, this article will focus on the establishment of the Okinawa Institute of Science and Technology (OIST). OIST is a new graduate school which has been launched in September 2012. OIST is located in Okinawa-jima, the main island in Okinawa prefecture. OIST has been established at the government expense and is operated largely by subsidies. OIST is expected to lay a foundation of the innovation clusters in Okinawa and contribute to the self-sufficient development of the economy of Okinawa which is relatively underdeveloped among the prefectures in Japan. OIST is said to be a pioneering attempt to solve a common problem of the world: widening divide between innovation centers and other locals. It was pointed out in 2000 that inequality between rich and poor countries has increased,[17] and this trend has not changed ever since. Within a country or a group of countries, for example in European regions, it is also pointed out that

16 *See* International Entrepreneurship, Total Entrepreneurial Activity per Country, available at http://www.internationalentrepreneurship.com/.

17 *See* Chris Freeman, *The Learning Economy and International Inequality, in* The Globalizing Learning Economy 147, 154–157 (Daniele Archibugi & Bengt-Åke Lundvall eds., 2001). The author indicated that the underdeveloped countries may close international gap during the years of a dominant technological regime and perhaps even more when profitability of that regime is becoming eroded in the leading countries, for finance capital is likely to be searching for new areas of profit at this stage and invest in catch-up countries. *See id.* at 160–61. It is, however, doubtful whether such a mechanism of development can work when the technological regimes are under continuous innovation.

the catching up of the poorest regions has stagnated since the 1980s.[18]

Question to be addressed here is whether OIST has a prospect for success in realizing its purpose. Section two of this article will describe the overview of OIST: its history, purpose and location. Then, section three will explain three issues regarding innovation in learning economy: omnipresence of innovation; positive and negative factors of innovation; relation between innovation and social upgrading of stakeholders. Section four examines three concrete conditions of the establishment of innovation clusters. Whether OIST satisfies these three conditions or not will be answered in the concluding remarks.

Such an analysis may have a broader implication. Up until the late 1980s, the income gap *within* developed countries had been diminishing. Since the 1990s, however, the trend has been reversed. Global competition has been widening the income gap within these countries as well as among countries. In particular, the emerging economies like so-called BRICS, i.e. Brazil, Russia, India, People's Republic of China (PRC) and South Africa, face serious social problems caused by expansion of income gap.[19]

2. Overview of the Okinawa Institute of Science and Technology (OIST).

(1) The History of OIST

The concept of a new graduate university in Okinawa was suggested by the former Minister of State for Okinawa and Northern Territories Affair, Mr. Koji Omi, in June 2001. The Diet approved the Okinawa In-

18 *See* Jan Fagerberg et al., *Technology, Growth and Unemployment Across European Regions,* 31 REGIONAL STUD. 457, 458, 462–64 (1997). The authors suggest that encouraging research and development (R&D) in backward regions appears more promising. *See id.* at 464. This article will amplify on the conditions which should be added to this suggestion.

19 The income gap may cause international tension. For example, the assertive actions by the PRC's government based on the frivorous claim over the Senkaku Islands may be understood as efforts to avert popular discontent from such income gap and corruption.

stitute of Science and Technology Promotion Corporation Act in March 2005, which established the OIST Promotion Corporation in order to design the organization and architecture of OIST. The Diet passed the Okinawa Institute of Science and Technology School Corporation Act in June 2009, according to which OIST was recognized as a school by the Ministry of Education, Culture, Sports, Science and Technology in November 2011. Members of the inaugural class have entered OIST in September 2012. The Japanese government has spent more than 85.9 billion yen, approximately 1.1 billion dollars from fiscal year 2005 to 2012.[20] The government is expected to subsidize more than 10 billion yen, about 100 million dollars, each year.[21]

As of September 1, 2012, there are 45 faculty members, including 31 non-Japanese, and 221 researchers, including 116 non-Japanese. When OIST advertised for 15 faculty posts in 2011, it got 548 applicants, including 417 people worked for non-Japanese institutes.[22] According to the President-erect of OIST, it set a high standard of appointment, ask-

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20 *See* Naikaku-hu, Okinawa-kagaku-gijyutu-daigakuin-daigaku ni tsuite, available at http://www8.cao.go.jp/okinawa/4/49.html (in Japanese). The expense includes the entrance fee and other costs for the kindergartens of researchers' children. *See* Sangi-in Kaigi-roku Jyoho, Dai–171-kai Kokkai, Okinawa oyobi Hoppou-mondai ni Kan-suru Tokubetu-iin-kai, Dai–6-go, July 1, 2009, available at http://kokkai.ndl.go.jp/SENTAKU/sangiin/171/0020/17107010020006c.html (a question by Councilor Azuma Kon-no) (in Japanese). There had been no international school in Okinawa that was authorized under Article one of the School Education Law of Japan. For providing the researchers' children an international school, Okinawa AMICUS International, which consists of preschool, kindergarten, elementary school and junior high school, was established in April 2011. Okinawa AMICUS International is located 15 minutes by car from OIST.

21 In 2011, OIST spent 54 million yen, approximately 540 thousand dollars, for a law firm to examine its employee's claim about harassment from a position of power. The Supervisory Committee for Contracts Concluded by OIST published recommendations for improving its management. *See* OIST Keiyaku-kanshi-iinkai, OIST no Keiyaku-jimu no Kaizen ni tsuite (Iken Gushin), available at http://mediasv.oist.jp/images/stories/OIST.pdf.

ing for scientists who were acknowledged as being in the top five to ten percent of their worldwide peer groups.[23] However, it might be worth noting the reality that the faculty includes only four members who hold Ph.D. or its equivalent from three universities which are rated within top 12 universities in the world by Time magazine: one holds Ph.D. from the California Institute of Technology (CALTEC), two hold Ph.D. from the University of California at Berkeley, and one holds *Doktor der Mathematik* from Swiss Federal Institute of Technology Zurich (ETH Zürich).[24] Out of 189 applicants for Ph.D. program, 41 persons passed and 34 persons from 18 countries and regions actually entered OITS.[25]

(2) The Purposes of OIST

Article one of the OIST School Corporation Act of 2009 declares two purposes of OITS. On the one hand, OIST is aimed at advancing science and technology for the benefit of the global community as a whole. It

22 Okinawa Institute of Science and Technology, Creating a New International Graduate University in Okinawa, Feb. 9, 2011, available at http://www.oist.jp/pressrelease/creating-new-international-graduate-university-okinawa.

23 Okinawa Institute of Science and Technology, Final Steps Towards New University at OIST, June 17, 2011, available at http://www.oist.jp/pressrelease/final-steps-towards-new-university-oist. *See also* Okinawa Times, Feb. 12, 2011 (noting that the President-erect of OIST told the applicants as "high-level").

24 Okinawa Institute of Science and Technology, OIST, April 2012. There is no member who holds Ph.D. or its equivalent from nine of the top 12 universities, including Stanford University, University of Oxford, Harvard University, Massachusetts Institute of Technology (MIT), Princeton University, University of Cambridge, Imperial College London, University of Chicago and Yale University. *See* The Times Higher Education World University Rankings 2012–2013, available at http://www.timeshighereducation.co.uk/world-university-rankings/2012–13/world-ranking. Distinguished Professor Sydney Brenner, who holds D.Phil. from University of Oxford, is said to be not active as a faculty member.

is typical that a Japanese statute declares its purpose as promotion of an abstract interest of the global community rather than a concrete interest of the Japanese people. Such stipulations make it quite difficult for the taxpayers to calculate the cost and benefit of the measures that the Act would implement, for there is little means to examine whether such policies really contribute to the global community as a whole. There is no one who has strong incentive to examine the attainment, because the Japanese taxpayers are not at all expected to gain substantial benefit from the Act, even if they happened to receive "collateral benefits." Both bureaucrats and politicians are likely to escape from the inquiry into the result of the policies.

It is, however, true that the governmental officials and OIST itself mention more direct interests of Japan, i.e. strengthening the competitiveness of the Japanese industries through the advancement of science and technology. A member of the Advisory Panel of Experts regarding OIST pointed out that half of the students are expected to be Japanese, because the Japanese government pays for OIST with the understanding that OIST offers opportunities of education for a substantial number of the Japanese students.[26]

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25 MIT has approximately 1,000 faculty and 600 teaching assistants. *See* L. Rafael Reif & Phillip L. Clay, *Should MIT Increase the Size of the Faculty?,* 10–2 MIT FACULTY NEWSLETTER, Nov./Dec., 2007, available at http://web.mit.edu/fnl/volume/202/reif_clay.html. More than that, it takes only 30 minutes afoot from the main campus of MIT to that of another large university, that is Harvard University. MIT and Harvard University are in very close collaboration in terms of education as well as research. OIST has no comparable community of scientists around itself.

26 *See* Dai-1-Kai Okinawa-kagaku-gijyutsu-daigakuin-daigaku-gakuen ni kansuru Yushiki-sya-Kondan-kai, July 17, 2012, available at http://www8.cao.go.jp/okinawa/4/yushikisya/1-gijiroku.pdf (statement of Mr. Koichi Endo) (in Japanese). *See also* OIST Graduate University Policies, Rules & Procedures, Chapter 1, Who We Are: Founding and Governing Principles, available at http://www.oist.jp/sites/default/files/ch01_who-we-are_20111130_en_cl_0.pdf (stating that collaboration with industry for the benefit of "competitiveness of Japan" as one of the five central concepts of OIST).

OIST is expected to contribute to the self-sustaining development of Okinawa, for Okinawa faces a number of economic and social problems. Okinawa has a unique history. After the surrender of the Empire of Japan in 1945, Okinawa had been occupied and administered by the United States until 1972. Even after the restoration of administration, there are extensive bases of the U.S. army, air force and marine, as well as those of the Self-Defense Forces of Japan. Against such a backdrop, the manufacturing industries have not developed much and its economy is heavily dependent on tourism. In 2009, the average income in Okinawa was the second lowest in 47 prefectures in Japan, 2.05 million yen, approximately 20.5 thousand dollars, compared with that in Tokyo, 3.90 Million yen, about 39.0 thousand dollars.[27] Faced with such a gap between the mainland Japan and Okinawa, article one of the Law on Special Measures for the Promotion and Development of Okinawa of 2002 declares its aim as "economic independence," that is, establishment of an economic system led by private sector, independent of subsidies from the national government.[28]

Of particular note is a lag of education. In 2012, all of the average percentage of correct answers in Japanese, mathematics and natural sciences by students of public junior high school in Okinawa were the lowest in Japan.[29] In 2010, the rate of advancement to universities in Okinawa was 36.6 percent which is also the lowest, in contrast with 65.4 percent in Tokyo.[30] Some people expect spill-over effect of OIST, promoting higher education in Okinawa. However, the problem is whether such a purpose is compatible with the other purpose, namely the establishment of innovation clusters. Human resources with higher

27 *See* Naikaku-hu Keizai-syakai-sogo-kenkyu-syo, Kokumin-keizai-tokei-bu, Heisei 21 Nendo no Ken-min Keizai Keisan ni tsuite, Feb. 29, 2012, available at http://www.esri.cao.go.jp/jp/sna/data/data_list/kenmin/files/contents/pdf/gaiyou2_1.pdf (in Japanese).

28 *See* Naikaku-hu-Okinawa-ken-Beikoku-chosa-dan, Beikoku-chiteki-kurasuta-Genchi-chosa-Hokoku, June, 2010, available at http://www8.cao.go.jp/okinawa/siryou/singikai/senmoniinkai/5/07–2.pdf (in Japanese).

education are a prerequisite, rather than its outcome, of the establishment of innovation clusters. It is true that there are several universities or colleges in Okinawa, but there seems not to be enough accumulation of intellectual capital. In 2009, the subsidies to the Ryukyus University, that is the only national university corporation in Okinawa, was 13 billion yen, approximately 130 million dollars, compared with 93 billion yen, about 930 million dollars to the University of Tokyo.[31]

(3)　Location of OIST

Okinawa is an archipelago isolated by the sea from any mainland where big cities are located. Okinawa may be regarded, however, as a

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29　*See* Koku-ritsu Kyoiku-Seisaku-Kenkyu-syo, Heisei 24 Nendo Zenkoku Gakuryoku-Gakusyu-jyokyo-chosa, Todohuken-betsu Syukei-kekka: Chosa-kekka-gaikyo, Okinawa-ken Seito (Ko-ritsu), Sep. 18, 2012, available at http://www.nier.go.jp/12chousakekkahoukoku/07todoufuken/24_chuu_todoufuken/47_okinawa/1_47_chuu_gaikyo_okinawa.pdf (in Japanese). There are recommendations for creating strong science, technology, engineering and math (STEM) programs in high schools in Okinawa. Second International Workshop: Towards the Development of a R&D Cluster in Okinawa, Mar. 29–30, 2012, Summary of the Workshop, at 3, available at http://www.oist.jp/sites/default/files/img/workshops/cluster2012/RDWorkshop2012-ResultsSummary.pdf; Okinawa institute of Science and Technology Promotion Corporation, International symposium and Workshop: Toward the Development of an R&D Cluster in Okinawa 14 (2010).

30　*See* Rate of Advancement to University and Rate of Employment by Prefectures, available at http://www.stat.go.jp/data/nihon/22.htm (in Japanese). The national average was 54.3%.

31　*See* Kokuritsu-Daigaku-Zaimu-Keiei-Senta, Kokuritsu-Daigaku-Hojin-Zaimu-bunseki-Kenkyu-kai, Kokuritsu-Daigaku-Hojin Zaimu-deta-gaiyo 2010 Nendo-han 23, 83, available at http://www.zam.go.jp/n00/pdf/ne005000.pdf (in Japanese). As of May 1, 2012, there are 845 personnel at Rukyus University, including 519faculty. *See* Kokuritsu-daigaku-hojin Ryukyu-daigaku Kyoin-su (Fuzoku-syogakko, Fuzoku-chugakko wo Nozoku), available at http://www.u-ryukyu.ac.jp/univ_info/education-official-announcement/worker_age.html.

center of the East Asian region, for it is one hour and half flight to Taipei, two hours flight to Shanghai, two hours and half flight to Seoul, Hong Kong and Tokyo, and three hours and half flight to Beijing.[32] (map. 1) However, there is no direct flight to any city beyond East Asian cities. Okinawa-jima is approximately 1,210 km^2 and has only 1.3 million residents. OIST is located at a suburb of Okinawa-jima and it takes some 60 minutes by car or 90 minutes by public bus from the Naha airport to OIST. Although Okinawa was under U.S. admini-

Map. 1: Location of Okinawa

Source: http://www.firstriding.co.jp/first/okinawa/.

32 There was direct flight to Manila, the Philippines. The distance from Naha airport to Manila is similar to that to Tokyo.

stration until 1972, few people speak English. This means researchers at OIST and their neighbors, including the workers of most local companies, have no common language. This is a most significant difference from Singapore that proclaimed itself as "the capital of education of Asia."[33] There are not enough companies that have sufficient resources to provide programs for human capital development. Even if some companies might offer such programs, few students in Okinawa seem to be well prepared to make use of such programs. In Okinawa, there is no graduate school which offers Master of Business Administration (MBA) course.

3. Innovation in Learning Economy

(1) Omnipresence of the demand for Innovation

Innovation seems to be needed only in high technologies. However, it is needed in traditional industries as well.[34] Innovation is not only necessary for the functional novelty but also new design or material, because the main point of the competition shifts from the 'use-value' of products to the 'sign-value' of brands.[35] For example, while Southeast Asia dominates the mass market of spectacles, Italy maintains a hold on the top end of the market, where profit margins are greater, by design intensity innovation based on close interaction with fashion industry and brand name marketing.[36] Innovation in manufacturing process, quality control, marketing, management and organizational paradigm

33 John N. Hawkins, *Educational Partnership with and Within Asia, in* THE POSSIBILITY OF AN EAST ASIAN COMMUNITY: RETHINKING SINO-JAPANESE RELATIONSHIP 375, 380 (Toyoshi Satow & Li Enmin eds., 2006).

34 Okinawa does have potential for becoming a center of marine science, for it has an abundant marine life. However, there are a number of conditions to be fulfilled before developing innovation clusters.

35 *See* PHILIP COOKE ET AL., REGIONAL KNOWLEDGE ECONOMIES: MARKETS, CLUSTERS AND INNOVATION 59 (2007).

36 *See* Lynn Mytelka & Fulvia Farinelli, *From Local Clusters to Innovation Systems, in* SYSTEMS OF INNOVATION AND DEVELOPMENT: EVIDENCE FROM BRAZIL 249, 264–65 (Jos E. Cassiolato et al. eds., 2003).

is also important. Such service as Knowledge Intensive Business Service (KIBS) may bridge function between the different actors like gatekeeper and trailblazer in the process of knowledge diffusion or transformation.[37]

(2) Positive and Negative Factors of Innovation

There are three factors which influence the possibility of innovation; institution, regulation and culture. First, accumulation of research institutes is a positive factor of innovation. Today, the importance of clustering has remained high in the knowledge system, while it has diminished in the production system.[38] Companies can locate their organs for innovation and production at different places. For example, Ericsson outsourced Research and Development (R&D) tactically for the purpose of filling specific knowledge gap, while it maintains the venue of strategic R&D in its home base, for the core R&D can only be conducted satisfactorily there.[39] As the cost for maintaining in-house R&D is getting higher and higher, they tend to subcontract the development of "specialist items" needed to complete the innovation process.[40] Companies specialized in research may serve as subcontractor. Once innovation clusters have been established and locked the compa-

37 *See* Schienstock, *supra* note 4, at 10.

38 *See* Chikashi Kishimoto, *Clustering and Upgrading in Global Value Chains: The Taiwanese Personal Computer Industry, in* Local Enterprises in the Global Economy: Issues of Governance and Upgrading 233, 260 (Hubert Schmitz ed., 2004).

39 *See* Cooke, *supra* note 5, at 15.

40 *See* Michael Gibbons et al., The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies 114 (1994). It is pointed out that, at the end of the 1980s, there had been already a substantial gap in all sectors between European companies and Japanese companies with regard to the rate of publications that were collaborative with external research institute. *See id.* at 115–17. It is probable that relatively low rate of collaboration among Japanese companies might contribute to their weakness in innovation, too.

nies in, it is difficult for the companies to move away, for they need to maintain the team and the network with these research companies.

Secondly, regulation and taxation is critical at the stage of creation of innovation clusters. Even when a cluster was formed by spontaneous agglomerations, the governmental policies could encourage the construction of the cluster.[41] When the clusters in Silicon Valley were formed in the late 1970s and 1980s, California wasn't heavily taxed, while such a State as Massachusetts, where Harvard University and Massachusetts Institute of Technology (MIT) were located, was known for heavy tax. This difference led much more entrepreneurs to Silicon Valley rather than greater Boston area. Nowadays, California has high income and property taxes for affording a third-highest prehousehold state and local government spending and stifling regulations regarding minimum wage, health insurance and environment. Hence, companies move away from production, outsourcing it to the out-of-State companies, to concentrate on innovation.

Thirdly, social and cultural factors are important, too. In general, people who are technology-savvy and open to novelties have more possibility to find market niches for themselves in the new industry.[42] When an organization has a culture that encourages hunches and gives them the space and time they need to evolve, innovation is more apt to be attained.[43] Especially, leaders' enthusiasm for innovation is necessary for the members of the organization to find a way to materialize new ideas.[44] In addition, people can try their ideas without hesitation

41 United Nations Conference on Trade and Development (UNCTAD), Promoting and Sustaining SMEs Clusters and Networks for Development, U.N. Doc. TD/B/COM.3/EM.5/2, at 2 (1998), available at http://archive.unctad.org/en/docs/c3em5d2.en.pdf.

42 However, a society whose members are obsessive about technological refinement too much might be isolated from other societies and falls into "Galápagos syndrome," or "Galápagosization." The case of "i-mode" function of cell phone invented in Japan might exemplify such a phenomenon. *See* Hiroko Tabuchi, Why Japan's Cellphones Haven't Gone Global, New York Times, July 19, 2009.

when the organization is tolerant of failure, recognizing "freedom to fail," and prepared to provide the second chance. The lack of an entrepreneurial culture may become a decisive hindering factor for the development of a related development path.[45] A Japanese proverb clearly explained the society which lacks entrepreneurial culture: a nail that sticks up is hammered down. In societies with such cultural character, inferior solutions may be adopted simply because the actors that favor them have the strongest power position. When institutional, political, or cognitive lock-in is so strong, people cannot free themselves from path dependency and proceed to the creation of new paths.[46]

Such culture may be reflected in the work conditions, for new network paradigm includes new work regulations of flexibility and self-regulation. The fact that many Japanese workers strongly opposed to the introduction of flexible work hours, including so-called "white collar exemption," suggests that they are not confident in their ability to manage their work by themselves. The Japanese government failed to introduce "white collar exemption" to the labor law in 2007. It named the bill "Happy Home Act." The opponents called the bill "Karo-shi (Death from Overwork) Act," for the bill would enable the companies to force their employees to work as long as they want without paying overtime allowances.[47] The real fear of the opponents might be that the companies would find their contributions insufficient when their com-

43 *See* Steven Johnson, Where Good Ideas Come from: The Natural History of Innovation 94 (2010). The author pointed out that companies tend to introduce common spaces where casual mingling and interdepartmental chatter happens without formal planning, for the possibility of innovation increases at such talk shop, rather than in private offices. *See id.* at 60–61 (referring to a concept of "West Village-ification of corporate office" coined by Malcolm Gladwell).

44 *See* Joel Kurtzman, Common Purpose: How Great Leaders Get Organisations to Achieve the Extraordinary 184 (2010).

45 *See* David B. Audretsch, *The Role of Small Firms in U.S. Biotechnology Industry,* 17 Small Business Economics 3, 8, 14 (2001).

46 *See* Schienstock, *supra* note 4, at 18.

panies evaluate them based exclusively on their performance rather than the length of time they spend at the office and mingle with their colleagues. Such mentality is far distant from entrepreneurship.

(3)　Relationship Between Innovation and Social Upgrading

Innovation does not necessarily contribute to social upgrading of the stakeholders. Innovation may produce harmful side-effects, for example, reducing the necessary workforce and deteriorating the unemployment rate. The employees at the production site, that might be located far from the center of innovation, might work under such a condition as "social dumping." Innovation does not necessarily contribute to the environmental sustainability, either.[48] More and more attention has been paid to the negative impact of innovation in terms of the ethical, social and environmental issues, in the absence of both external regulation and self-regulation of large firms.[49]

Innovation, however, has the possibility to promote social upgrading especially through the global value chains (GVCs). Innovative companies in developed countries can require their business partners not only to improve their products for adjusting them with the strengthened regulations of the imported countries, but also to ameliorate the treatment of the employees. In particular, they can implement corporate social responsibility (CSR), taking measures to ensure standards of labor condition and equitable distribution of income.[50] The same mecha-

47　As for "white collar exemption" in Japan, *see generally* Sachiko Kuroda & Isamu Yamamoto, Howaito-kara Ekuzenpusyon to Rodo-sha no Hatarakikata, 27 Rieti Highlight 22 (2009) (in Japanese).

48　*See* Jose Antonio Puppin de Oliveira, *Introduction: Social Upgrading Among Small Firms and Clusters, in* Upgrading Clusters and Small Enterprises in Developing Countries: Environmental, Labor, Innovation and Social Issues 1, 10 (Jose Antonio Puppin de Oliveira ed., 2008).

49　*See* Lundvall & Archibugi, *supra* note 2, at 7.

50　*See, e.g.,* Antonio Vives, *Social and Environmental Responsibility in Small and Medium Enterprises in Latin America*, 21 J. Corporate Citizenship 39, 40 (2006).

nism may work for environmental problems as well. It is pointed out that access of the local companies to the international market is a critical condition for the innovative companies to contribute to the social upgrading of the stakeholders relating to the local business partners. For example, deforestation in the Amazon Basin has remained at high, in spite of the demand for forest products certified by the Forest Stewardship Council has grown exponentially. Many of the drivers of deforestation, such as firms that supply timber to local markets, are not linked to GVCs.[51]

4. Conditions of Innovation Cluster

It is recognized that clusters are the foundation of innovation. Innovation clusters are different from industrial clusters in the traditional sense, whose advantage is the collective efficiency known as scale merit. Innovation clusters promote innovation by enabling interaction among the researchers and managers in the region. In particular, innovation clusters offer unique opportunities that small and medium enterprises (SMEs) access external knowledge.[52] For example, start-ups are more likely to find mentors for their activities within these clusters. It is pointed out that one of the difficulties entrepreneurs in Tokyo face is the lack of mentors who can teach whether the start-up activities are on the right track.[53] Furthermore, SMEs may cooperate with neighboring large companies which have global network to access the global market that they cannot reach by themselves. Thus, the examination

51 *See* Puppin de Oliveira, *supra* note 47, at 13.

52 *See* Özlem Özkanli & Erdal Akdeve, *Innovation Ability of Small Firms in Turkish Industrial Clusters: Ankara-Ivedik Industrial Region Case, in* Innovation Policies, Business Creation and Economic Development 159, 162 (Aydogan, Neslihan ed., 2009).

53 *See* Hiroko Tabuchi, Japan's New Tech Generation, New York Times, Oct. 3, 2012.

of conditions for establishing innovation clusters is important when one would like to understand innovation itself.

(1)　Center of Research

R&D divisions of companies are required to concentrate on applied science in order to accomplish their task in short terms. Therefore, they can hardly serve as a vehicle of innovation in the real sense.[54] In fact, market-led innovations are in the minority. It is said that all of the great discoveries of drugs have been done in university laboratories, often with public funding, not in R&D laboratories of pharmaceutical companies.[55] It is a misconception often held by policy makers that R&D as both necessary and sufficient for innovation.[56] Therefore, research universities which set great store on basic science are significant for establishing innovation clusters.[57] Universities play more important roles for educating technicians of sophisticated technologies, as well.[58]

Existence of universities, however, might be neither a necessary condition nor a sufficient condition. For example, in Israel, military instead of universities serves as a pool of highly specialized technicians for innovation clusters.[59] An isolated university cannot be a foundation for establishing innovation clusters. Although the center of traditional way of production of knowledge－ which may be called Mode 1－ is universities, new mode of acquiring knowledge－ Mode 2－ has emerged where knowledge is generated by temporary team or network of a vast

54　*See* Mytelka & Farinelli, *supra* note 35, at 259.

55　*See* Megan McArdle, Serendipitous Connection; Innovation Occurs When Ideas from Different People Bang Against Each Other, Wall Street Journal, Oct. 4, 2010.

56　*See* Graham, *supra* note 3, 368.

57　*See* Stuart O. Schweitzer et al., *Clustering in the Biotechnology Industry, in* Health Policy and High-tech Industrial Development: Learning from Innovation in the Health Industry 206, 216 (Marco R. Di Tommaso & Stuart O. Schweitzer eds., 2005).

58　*See* Cooke et al., *supra* note 34, at 58.

array of specialists in trans-disciplinary context of application.[60] Mode 2 is defined as "[k]nowledge production carried out in the *context of application* and marked by its: *transdisciplinarity; heterogeneity;* organisational heterarchy and transience; social accountability and *reflexivity;* and quality control which emphasises context- and use- dependence."[61] Such a mode is a result of the parallel expansion of knowledge producers and users in society, so that participation of social scientists, natural scientists, engineers, lawyers and businesspeople is critical. It is valuable for companies to have their competitors next to their laboratories. Companies are able to offset the costs of operating in urban setting and high rate of staff turnover, for ideas can cross-fertilize when the workers change their jobs.

(2) A Pool of Human Resources with Specialized Knowledge

Innovation clusters should be based on a pool of human resources with specialized knowledge, because it serves three functions for promoting innovation. First, the cost for searching and recruiting experts decreases in clusters. Biotechnological clusters are formed around the

59 *See* Timothy Bresnahan & Alfonso Gambardella, *Old-Economy Inputs for New-Economy Outcomes: What Have We Learned?, in* BUILDING HIGH-TECH CLUSTERS: SILICON VALLEY AND BEYOND 331, 344 (Timothy Bresnahan & Alfonso Gambardella eds., 2004). In the past, migration from the developing countries has been criticized as "brain drain," and these countries have made efforts to prevent the talented nationals from migrating to abroad. However, these migrants who experience the ICT markets in the developed countries and maintain the network with persons in the markets can be return and contribute to the development of their native countries. For the possibility of such "brain gain" or "reverse brain drain," some developing countries regard the migration as a step to the "brain gain." *See id.* at 345–46. *See also* Yoshiaki Sato, A Scheme for Circulation of Nurses in East Asia: A Bottom-Up Approach for Deepening Regional Cooperation, USJP Occasional Paper, Weatherhead Center for International Affairs, Harvard University 1, 13–14 (2012).

60 *See* GIBBONS ET AL., *supra* note 39, at 9, 11.

61 *See id.* at 167 (emphasis in original).

research universities, for researchers would like to keep their position at the universities even when they begin collaboration with a company in order to maintain their team and research equipment.[62] Secondly, the embedment of a person within social networks in a cluster sufficiently mitigates his or her career concerns. As far as a person belongs to a successful cluster and keeps numerous informal links across the researchers and managers in the region, it is safe for him or her to work for a lucrative but highly risky start-up, for he or she may expect to find the next job easily. Hence, the construction of flexible labor markets within clusters is crucial driver of success.[63] Thirdly, it is said that the reason of the success of Silicon Valley, compared with the failure of greater Boston area, rests on the development of a sense of community challenging the exploration of uncharted technological terrain. Such a sense of community accompanied with labor mobility, boosts the diffusion of knowledge.[64]

(3)　Urban Infrastructure

At a glance, it seems possible for people to establish virtual networks by utilizing ICT as well as developed means of transportation including airplane so that they no longer need to meet face to face daily.[65] It is true that social networks play an important role.[66] However, it is also true that firms continue to set a high premium on physical　proximity.[67] As specialization deepens, "know who" becomes more important than "know how."[68] People who know the person who is a repository of

62　*See* Schweitzer et al., *supra* note 56, at 209–10, 216.

63　*See* Casper, *supra* note 8, at 23–24.

64　*See* Anna Lee Saxenian, Regional Advantage: Culture and Competition in Silicon Valley and Route 128, at 30–37 (1994).

65　*See* Puppin de Oliveira, *supra* note 47, at 6.

66　An adequate understanding of spatial systems of innovation requires the points of view not only of local embedding but also of social network and inter-organizational relations. *See* Bart Nooteboom, *Innovation, Learning and Cluster Dynamics, in* Clusters and Regional Development: Critical Reflections and Exploration 137, 139 (Bjørn Asheim et al. eds., 2006).

'know-that' or better 'know-how' deem to be most knowledgeable ones.[69] It is often the case that tacit or un-codified knowledge accumulates to be collective knowledge among certain close circle of people. When tacit knowledge plays an important role, which is greatest at the early stages of the life cycle of technologies, innovative activities tend to cluster more.[70] As the significance of tacit knowledge has increased, greater intensity of face to face interaction is required.[71] Mutual learning through indirect and informal routes, including job-hopping by R&D staff, is an important knowledge source for product design and development and other types of innovation though formal inter-firm technological cooperation is rarely observed among local competitors.[72]

It is pointed out that "as cities get bigger, they generate ideas at a faster clip." According to an experimental rule called "the quarter-power law" in positive sense, a city that is ten times larger than its neighbor is not ten times more innovative; it is said to be 17 times more innovative and a metropolis 50 times bigger than a town should be 130 times more innovative.[73] Cities enable people to find the "adjacent possible" who may provide the spare parts which are missing for them to come up with good ideas.[74] In fact, "urbanization" of economies has been pointed out as early as in the mid–1990s, when relatively more

67 *See* Kevin Morgan, *The Exaggerated Death of Geography: Leaning, Proximity and Territorial Innovation Systems,* 4 J. ECONOMIC GEOGRAPHY 3, 4 (2004).

68 *See* COOKE ET AL., *supra* note 34, at 60, 69.

69 *See* Cooke, *supra* note 5, at 2.

70 *See* John Cantwell, *Introduction to* GLOBALIZATION AND THE LOCATION OF FIRMS, at xiv (John Cantwell ed., 2004).

71 *See* John Cantwell & Grazia D. Santangelo, *Capitalism, Profits and Innovation in the New Techno-Economic Paradigm*, 10 J. EVOLUTIONARY ECONOMICS 131, 145 (2000).

72 Kishimoto, *supra* note 37, at 256.

73 *See* JOHNSON, *supra* note 42, at 10.

74 *See id*. at 32–42.

populous locales, or places easily accessible to metropolitan areas, were more likely to house knowledge-generating institutions such as universities, industry research laboratories and trade associations.[75]

Urban turn of high-tech clusters has become even more apparent in recent years. New high-tech centers are quite often located in cities with high standard of living and much infrastructure serving mobility, including easy access to airports and fast rail stations, housing, education, cultural animation and leisure, a contest fought with the weapons of tax reliefs and subsidies.[76] For example, "Silicon Beach" in Los Angeles, approximately 3 mile strip between Santa Monica and Venice, has become a notable start-up hub. Its walkability and urban-like amenities make it the place where young techies prefer to live, work and play.[77] The cluster is expected to be a "vast, informal club," where people can meet their customers, venders, collaborators and investors at cafes, school PTA meetings and gyms.[78] The micro environment really matters for the settlement of talented people.

5. Concluding Remarks

During the Diet deliberation of the bill of OIST School Corporation Act, some doubts were casted upon the prospects of OIST. For example, while the Japanese government referred San Diego, California, as a reference, it is pointed out that Okinawa does not have a couple of vital characteristics that San Diego has. First of all, San Diego is adjacent to the mainland. Secondly, there have been several well-known universi-

75 *See* Bennett Harrison et al., *Innovative Firm Behavior and Local Milieu: Exploring the Intersection of Agglomeration, Firm Effects, and Technological Change,* 72 ECONOMIC GEOGRAPHY 233, 235–36 (1996).

76 *See* HUBER, *supra* note 14, at 331.

77 *See* Richard Florida, The Joys of Urban Tech; Goodbye, Office Parks; Drawn by Amenities and Talent, Tech Firms Are Opting for Cities, Wall Street Journal, Sep. 1, 2012. (noting a remark by a CEO of a coaching company that "the bar or the restaurant becomes an extended conference room").

78 *See* Sormon, *supra* note 9.

ties and research institutions such as University of California at San Diego, Salk Institute for Biological Studies and the Scripps Research Institute in San Diego, from which more than 200 companies have been spun off.[79] In addition, as the report of the research team of the Cabinet and the Okinawa Prefecture rightly focused on, the clusters in San Diego have their foundations on the accumulation of human resources, which are developed through the educational programs offered by the regional life science association of nearly 600 companies, named Biocom.[80] In 2005, University of California at San Diego established a business school which offers courses of MBA for the working people as well as full-time students. None of these characteristics is found in case of Okinawa.

The trend in innovation clusters is summarized in a phrase: "from 'let's build a campus' to 'let's build a city."[81] Efforts to establish second Silicon Valleys by direct means have achieved only "pale copies" of the original.[82] "Science parks" tend to have weak local cooperative environments, so that they can hardly promote innovativeness and competitiveness of the local industries, especially SMEs, for securing the endogenous regional development.[83] One of the notorious failures may be found in the Japanese policy to create Techno-polis.[84] It is suggested

79 *See* Sangi-in Kaigi-roku Jyoho, Dai–171-kai Kokkai, Okinawa oyobi Hoppou-mondai ni Kan-suru Tokubetu-iin-kai, Dai–6-go, July 1, 2009, available at http://kokkai.ndl.go.jp/SENTAKU/sangiin/171/0020/17107010020006c.html (a question by Councilor Tsukasa Iwamoto) (in Japanese). There are more than 900 scientific staff at Salk Institute alone, including 58 faculty. *See* Scientist & Research, available at http://www.salk.edu/faculty/.

80 *See* Naikaku-hu-Okinawa-ken-Beikoku-chosa-dan, Beikoku-chiteki-kurasuta-Genchi-chosa-Hokoku, June, 2010, available at http://www8.cao.go.jp/okinawa/siryou/singikai/senmoniinkai/5/07–2.pdf (in Japanese).

81 *See* Florida, *supra* note 76.

82 *See* Sormon, *supra* note 9.

83 *See* Bjørn T. Asheim, *On the New Economic Geography of Post-Fordist Leaning Economies, in* VOICES FROM THE NORTH: NEW TRENDS IN NORDIC HUMAN GEOGRAPHY 29, 41 (Jan Öhman & Kirsten Simonsen eds., 2003).

that, for understanding innovation more deeply, researchers have to pay more attention to failure which would reveal much about where power has actually rested.[85] The Japanese government has learnt little from the failure of Techno-polis. Minister of State for Okinawa and Northern Territories Affairs, Tsutomu Sato, declared that "a university-town would emerge spontaneously around OIST."[86] Such a stereotype view based on myth rather than facts has even adverse effects.[87] It is more likely for OIST to end up being isolated from the neighboring people, for Okinawa satisfies none of the three conditions for establishing innovation clusters. The fatal point lies in the lack of human resources with higher education, for advanced training should be combined with a robust educational basis in order to gain higher return.[88]

The Japanese government, in concert with the general trend in the Japanese society, tends to focus on most under-developed regions and subsidizes much toward them, rather than encourages most developed region to be more competitive in the world market. A panelist pointed out rightly at the first international symposium held at OIST, "[e]ven if OIST succeeds in doing excellent research and providing human resources, Okinawa will not be able to win the competition with OIST alone. In order to win a severe international competition [with Abu

84 *See* Philip Cooke, *Introduction: Regional Innovation Systems: An Evolutionary Approach, in* Regional Innovation Systems: The Role of Governances in a Globalized World 1, 14 (Philip Cooke et al. eds., 2d ed. 2004).

85 *See* Graham, *supra* note 3, 365.

86 Sangi-in Kaigi-roku Jyoho, Dai171kai Kokkai, Okinawa oyobi Hoppoumondai ni Kan-suru Tokubetu-iin-kai, Dai6gou, july 1, 2009, available at http://kokkai.ndl.go.jp/SENTAKU/sangiin/171/0020/17107010020006c.html (answer by Minister of State Tsutomu Sato) (in Japanese).

87 *See* Nooteboom, *supra* note 65, at 137.

88 *See* Gilberto Antonelli & Mario Nosvelli, *Demand for Skilled Labour Services, Job Design and the 'Revealed Learning Function', in* Dynamic Capabilities Between Firm Organization and Local Systems of Production 107, 111, 128 (Riccardo Leoncini & Sandro Montresor eds., 2008).

Dhabi, Tianjin, Silicon Valley and so on], it is indispensable to develop, with collaboration across the whole region, a package that is superior to other regions in Japan and abroad."[89] Trajectories of development may be multiple, so that there remains the possibility for OIST to achieve something. Further examinations will be needed to conclude whether OIST accomplishes success, *against* the current trend, in "kill-two birds-with-one-stone," or declines as anticipated.

A question remains: what is an appropriate policy to promote innovation? Some argue that the top-down directives aimed at the jump start of the clusters are foolish, although governmental policies have mattered to some extent.[90] As a society becomes more and more complicated, politicians and bureaucrats are no longer absolutely superior to the private stakeholders in terms of knowledge of leading-edge technology, current situation of the market or possible externalities of the policies. Therefore, the participation of all of the important stakeholders is necessary for selecting appropriate policies and securing their effective implementation. Reflecting such fragmentation of political power, a new way of governance has been emerged, in which the decisions are made collectively by policy networks, either intra-organizational ones or inter-organizational ones. Politicians and bureaucrats may have unique role to construct a future vision and prioritize the concrete measures. They are expected to coordinate the stakeholder's behavior as well.[91] Politics can offer a process of "discursive coordination," that is not necessarily aimed at reaching a consensus within a short period of time, but aimed at starting their mutual learn-

89 Okinawa institute of Science and Technology Promotion Corporation, International Symposium and Workshop: Toward the Development of an R&D Cluster in Okinawa 11 (2010) (Statement of Dr. Hiroaki Kitano). At the same symposium, Mr. Sass Somekh pointed out that Okinawa lacks two important components for developing clusters, namely military research as an origin of spin-off companies and big companies that people to start new companies. *See id.* at 12.

90 *See* Bresnahan & Gambardella, *supra* note 58, at 355–56.

ing.[92] The government cannot always control rationally, by specifying the best practice and evaluating the achievement with mechanistic bench marks. It is required to allow "try and error" and manage a recursive process by setting flexible standards that should be reexamined continuously and reflect the feedbacks.

One of the productive strategies for the government to encourage the private initiatives for establishing innovation clusters may be found in Singapore. Of particular note include the measures for encouraging research and development by lowering taxes, loosening regulations and improving education.[93] A modest but more promising move might be the proposal by the University of Tokyo to change its commencement of academic year from April to September, accommodate it with other universities in the United States and European countries. This change would facilitate the students from overseas to study at the University of Tokyo and improve the education in Japan in general.[94] The University of Tokyo, however, decided to maintain its schedule for entrance and graduation for the time being; in April and March respectively. It seems to be unable to resist the domestic oriented people who are worried about the inconvenience of the Japanese new students who might have graduated from high schools in March. This anecdote might be

91 *See* Stan Metcalfe, *Technology Systems and Technology Policy in an Evolutionary Framework, in* TECHNOLOGY, GLOBALIZATION AND ECONOMIC PERFORMANCE 268, 274 (Daniele Archibugi & Jonathan Michie eds., 1997). *See also* Cooke, *supra* note 5, at 7 (*noting* that the "governance professionals no longer possess the substantive knowledge…the modern regional development manager mainly has process competences rather than substantive capabilities.")

92 *See* Schienstock, *supra* note 4, at 15.

93 *See* Sormon, *supra* note 9. The Japanese government might have a view to utilize OIST as a means to create a hub of innovative networks within East Asia. However, Singapore has gone far ahead in this sense.

94 Asahi Shimbun, Oct 24, 2012, available at http://www.asahi.com/national/update/1024/TKY201210240611.html. If this proposal were adopted, the freshmen would take special educational programs during the gap period from April to August.

another example of the domestic-orientation of the Japanese system of human development.