Impact of Government Organizational Reform to Research Legal System and Response Thereto (2) – Observation of the Swiss Research Innovation System

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I. Foreword

Switzerland is a landlocked country situated in Central Europe, spanning an area of 41,000 km2, where the Alps occupy 60% of the territory, while it owns little cultivated land and poor natural resources. In 2011, its population was about 7,950,000 persons[1]. Since the Swiss Federal was founded, it has been adhering to a diplomatic policy claiming neutrality and peace, and therefore, it is one of the safest and most stable countries in the world. Switzerland is famous for its high-quality education and high-level technological development and is very competitive in biomedicine, chemical engineering, electronics and metal industries in the international market. As a small country with poor resources, the Swiss have learnt to drive their economic and social development through education, R&D and innovation a very long time ago. Some renowned enterprises, including Nestle, Novartis and Roche, are all based in Switzerland. Meanwhile, a lot of creative small-sized and medium-sized enterprises based in Switzerland are dedicated to supporting the export-orientation economy in Switzerland.

Switzerland has the strongest economic strength and plentiful innovation energy. Its patent applications, publication of essay, frequencies of quotation and private enterprises' innovation performance are remarkable all over the world. According to the Global Competitiveness Report released by the World Economic Forum (WEF), Switzerland has ranked first among the most competitive countries in the world for four years consecutively since 2009[2]. Meanwhile, according to the Global Innovation Index (GII) released by INSEAD and the World Intellectual Property Organization (WIPO) jointly, Switzerland has also ranked first in 2011 and 2012 consecutively[3]. Obviously, Switzerland has led the other countries in the world in innovation development and economic strength. Therefore, when studying the R&D incentives and boosting the industrial innovation, we might benefit from the experience of Switzerland to help boost the relevant mechanism in Taiwan.

Taiwan's government organization reform has been launched officially and boosted step by step since 2012. In the future, the National Science Council will be reformed into the "Ministry of Science and Technology", and the Ministry of Economic Affairs into the "Ministry of Economy and Energy", and the Department of Industrial Development into the "Department of Industry and Technology". Therefore, Taiwan's technology administrative system will be changed materially. Under the new government organizational framework, how Taiwan's technology R&D and industrial innovation system divide work and coordinate operations to boost the continuous economic growth in Taiwan will be the first priority without doubt. Support of innovation policies is critical to promotion of continuous economic growth. The Swiss Government supports technological research and innovation via various organizations and institutions effectively. In recent years, it has achieved outstanding performance in economy, education and innovation. Therefore, we herein study the functions and orientation of the competent authorities dedicated to boosting research and innovation in Switzerland, and observe its policies and legal system applied to boost the national R&D in order to provide the reference for the functions and orientation of the competent authorities dedicated to boosting R&D and industrial innovation in Taiwan.

II. Overview of Swiss Federal Technology Laws and Technology Administrative System

Swiss national administrative organization is subject to the council system. The Swiss Federal Council is the national supreme administrative authority, consisting of 7 members elected from the Federal Assembly and dedicated to governing a Federal Government department respectively. Switzerland is a federal country consisting of various cantons that have their own constitutions, councils and governments, respectively, entitled to a high degree of independence.

Article 64 of the Swiss Federal Constitution[4] requires that the federal government support research and innovation. The "Research and Innovation Promotion Act" (RIPA)[5] is dedicated to fulfilling the requirements provided in Article 64 of the Constitution. Article 1 of the RIPA[6]

expressly states that the Act is enacted for the following three purposes: 1. Promoting the scientific research and science-based innovation and supporting evaluation, promotion and utilization of research results; 2. Overseeing the cooperation between research institutions, and intervening when necessary; 3. Ensuring that the government funding in research and innovation is utilized effectively. Article 4 of the RIPA provides that the Act shall apply to the research institutions dedicated to innovation R&D and higher education institutions which accept the government funding, and may serve to be the merit for establishment of various institutions dedicated to boosting scientific research, e.g., the National Science Foundation and Commission of Technology & Innovation (CTI). Meanwhile, the Act also provides detailed requirements about the method, mode and restriction of the government funding.

According to the RIPA amended in 2011, the Swiss Federal Government's responsibility for promoting innovation policies has been extended from "promotion of technology R&D" to "unification of education, research and innovation management", making the Swiss national industrial innovation framework more well-founded and consistent[8] . Therefore, upon the government organization reform of Switzerland in 2013, most of the competent authorities dedicated to technology in Swiss have been consolidated into the Federal Department of Economic Affairs, Education and Research.

Under the framework, the Swiss Federal Government assigned higher education, job training, basic scientific research and innovation to the State Secretariat for Education, Research and Innovation (SERI), while the Commission of Technology & Innovation (CTI) was responsible for boosting the R&D of application scientific technology and industrial technology and cooperation between the industries and academy. The two authorities are directly subordinate to the Federal Department of Economic Affairs, Education and Research (EAER). The Swiss Science and Technology Council (SSTC), subordinate to the SERI is an advisory entity dedicated to Swiss technology policies and responsible for providing the Swiss Federal Government and canton governments with the advice and suggestion on scientific, education and technology innovation policies. The Swiss National Science Foundation (SNSF) is an entity dedicated to boosting the basic scientific R&D, known as the two major funding entities together with CTI for Swiss technology R&D. The organizations, duties, functions and operations of certain important entities in the Swiss innovation system are introduced as following.

Date source: Swiss Federal Department of Economic Affairs, Education and Research official website

Fig. 1 Swiss Innovation Framework Dedicated to Boosting Industries—Swiss Federal Economic, Education and Research Organizational Chart

1. State Secretariat of Education, Research and Innovation (SERI)

SERI is subordinate to the Department of Economic Affairs, Education and Research, and is a department of the Swiss Federal Government dedicated to managing research and innovation. Upon enforcement of the new governmental organization act as of January 1, 2013, SERI was established after the merger of the State Secretariat for Education and Research, initially subordinate to Ministry of Interior, and the Federal Office for Professional Education and Technology (OEPT), initially subordinated to Ministry of Economic Affairs. For the time being, it governs the education, research and innovation (ERI). The transformation not only integrated the management of Swiss innovation system but also unified the orientations toward which the research and innovation policy should be boosted.

SERI's core missions include "enactment of national technology policies", "coordination of research activities conducted by higher education institutions, ETH, and other entities of the Federal Government in charge of various areas as energy, environment, traffic and health, and integration of research activities conducted by various government entities and allocation of education, research and innovation resources. Its functions also extend to funding the Swiss National Science Foundation (SNSF) to enable SNSF to subsidize the basic scientific

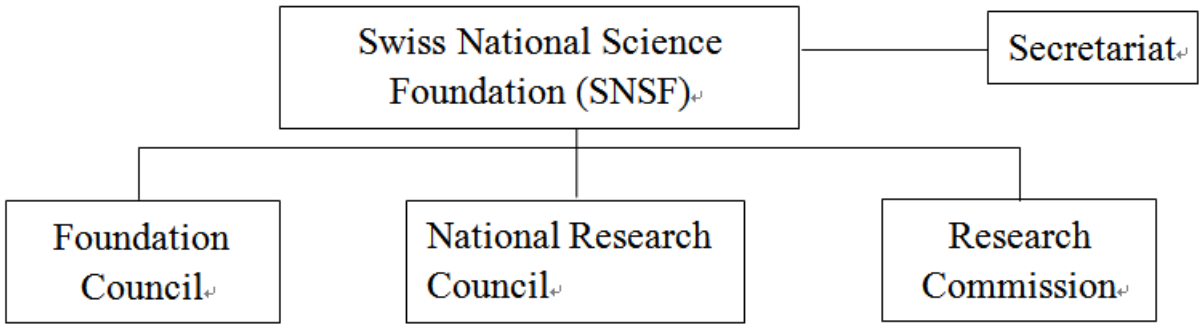
research. Meanwhile, the international cooperation projects for promotion of or participation in research & innovation activities are also handled by SERI to ensure that Switzerland maintains its innovation strength in Europe and the world.

The Swiss Science and Technology Council (SSTC) is subordinate to SERI, and also the advisory unit dedicated to Swiss technology policies, according to Article 5a of RIPA[9]. The SSTC is responsible for providing the Swiss Federal Government and canton governments with advice and suggestion about science, education and innovation policies. It consists of the members elected from the Swiss Federal Council, and a chairman is elected among the members.

2. Swiss National Science Foundation (SNSF)

The Swiss National Science Foundation (SNSF) is one of the most important institutions dedicated to funding research, responsible for promoting the academic research related to basic science. It supports about 8,500 scientists each year. Its core missions cover funding as incentives for basic scientific research. It grants more than CHF70 million each year. Nevertheless, the application science R&D, in principle, does not fall in the scope of funding by the SNSF. The Foundation allocates the public research fund under the competitive funding system and thereby maintains its irreplaceable identity, contributing to continuous output of high quality in Switzerland.

With the support from the Swiss Federal Government, the SNSF was established in 1952. In order to ensure independence of research, it was planned as a private institution when it was established[10]. Though the funding is provided by SERI, the SNSF still has a high degree of independence when performing its functions. The R&D funding granted by the SNSF may be categorized into the funding to free basic research, specific theme-oriented research, and international cooperative technology R&D, and the free basic research is granted the largest funding. The SNSF consists of Foundation Council, National Research Council and Research Commission[11].



Data source: prepared by the Study

Fig. 2 Swiss National Science Foundation Organizational Chart

(1) Foundation Council

The Foundation Council is the supreme body of the SNSF[12], which is primarily responsible for making important decisions, deciding the role to be played by the SNSF in the Swiss research system, and ensuring SNSF's compliance with the purpose for which it was founded. The Foundation Council consists of the members elected from the representatives from important research institutions, universities and industries in Swiss, as well as the government representatives nominated by the Swiss Federal Council. According to the articles of association of the SNSF[13], each member's term of office should be 4 years, and the members shall be no more than 50 persons. The Foundation Council also governs the Executive Committee of the Foundation Council consisting of 15 Foundation members. The Committee carries out the mission including selection of National Research Council members and review of the Foundation budget.

(2) National Research Council

The National Research Council is responsible for reviewing the applications for funding and deciding whether the funding should be granted. It consists of no more than 100 members, mostly researchers in universities and categorized, in four groups by major[14], namely, 1. Humanities and Social Sciences; 2. Math, Natural Science and Engineering; 3. Biology and Medical Science; and 4. National Research Programs (NRPs) and National Centers of Competence in Research (NCCRs). The NRPs and NCCRs are both limited to specific theme-oriented research plans. The funding will continue for 4~5years, amounting to CHF5 million~CHF20 million[15]. The specific theme-oriented research is applicable to non-academic entities, aiming at knowledge and technology transfer, and promotion and application of research results. The four groups evaluate and review the applications and authorize the funding amount.

Meanwhile, the representative members from each group form the Presiding Board dedicated to supervising and coordinating the operations of the National Research Council, and advising the Foundation Council about scientific policies, reviewing defined funding policies, funding model and funding plan, and allocating funding by major.

(3) Research Commissions

Research Commissions are established in various higher education research institutions. They serve as the contact bridge between higher education academic institutions and the SNSF. The research commission of a university is responsible for evaluating the application submitted by any researcher in the university in terms of the school conditions, e.g., the school's basic research facilities and human resource policies, and providing advice in the process of application. Meanwhile, in order to encourage young scholars to attend research activities, the research committee may grant scholarships to PhD students and post-doctor research[16].

~to be continued~

[1] SWISS FEDERAL STATISTICS OFFICE, *Switzerland's population 2011* (2012), http://www.bfs.admin.ch/bfs/portal/en/index/news/publikationen.Document.163772.pdf (last visited Jun. 1, 2013).

[2] WORLD ECONOMIC FORUM [WEF], *The Global Competiveness Report 2012-2013* (2012),

http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf (last visited Jun. 1, 2013); WEF, *The Global Competiveness Report 2011-2012* (2011), http://www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf (last visited Jun. 1, 2013); WEF, *The Global Competiveness Report 2010-2011* (2010), http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2010-11.pdf (last visited Jun. 1, 2013); WEF, *The Global Competiveness Report 2009-2010* (2009),. http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2009-10.pdf (last visited Jun. 1, 2013).
[3] INSEAD, *The Global Innovation Index 2012 Report* (2012), http://www.globalinnovationindex.org/gii/GII%202012%20Report.pdf (last visited Jun. 1, 2013); INSEAD, *The Global Innovation Index 2011 Report* (2011), http://www.wipo.int/freepublications/en/economics/gii/gii_2011.pdf (last visited Jun. 1, 2013).
[4] SR 101 Art. 64: “Der Bund fördert die wissenschaftliche Forschung und die Innovation.”
[5] Forschungs- und Innovationsförderungsgesetz, vom 7. Oktober 1983 (Stand am 1. Januar 2013). For the full text, please see www.admin.ch/ch/d/sr/4/420.1.de.pdf (last visited Jun. 3, 2013).
[6] *Id.*
[7] *Id.*
[8] CTI, *CTI Multi-year Program 2013-2016 7(2012)*, *available at* http://www.kti.admin.ch/?lang=en&download=NHzLpZeg7t,lnp6l0NTU042l2Z6ln1ad1lZn4Z2qZpnO2Yuq2Z6gpJCDeYR,hGym162epYbg2c_JjKbNoKSn6A-- (last visited Jun. 3, 2013).
[9] *Supra* note 5.
[10] Swiss National Science Foundation, http://www.snf.ch/E/about-us/organisation/Pages/default.aspx (last visited Jun. 3, 2013).
[11] *Id*.
[12] Foundation Council, Swiss National Science Foundation, http://www.snf.ch/E/about-us/organisation/Pages/foundationcouncil.aspx (last visited Jun. 3, 2013).
[13] See Statutes of Swiss National Science Foundation Art.8 & Art. 9, *available at* http://www.snf.ch/SiteCollectionDocuments/statuten_08_e.pdf (last visited Jun. 3, 2013).
[14] National Research Council, Swiss National Science Foundation, http://www.snf.ch/E/about-us/organisation/researchcouncil/Pages/default.aspx (last visted Jun.3, 2013).
[15] Theres Paulsen, *VISION RD4SD Country Case Study Switzerland* (2011), http://www.visionrd4sd.eu/documents/doc_download/109-case-study-switzerland (last visited Jun.6, 2013).
[16] Research Commissions, Swiss National Science Foundation, http://www.snf.ch/E/about-us/organisation/Pages/researchcommissions.aspx (last visted Jun. 6, 2013).

Release : 2015/12

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