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Country Study: South Korea

Sangook Park | Jinhee Kim

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Contents

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Introduction

There is little doubt that South Korea is one of the most innovative economies in the world. Korean people might deny this since they are not good at satisfying themselves. But from the objective perspective, or compared with other countries, Korea has been ranked at the top tier for a while, since the early 2010s. Table 1-1 presents some indices and comments about Korea's innovation ecosystem. The strengths of Korea's national innovation ecosystem are from private sector R&D, especially by several large firms like Samsung Electronics. Some may argue that Samsung's dominance in making innovations may fool the eyes into over-evaluate Korea's innovation ecosystem. However, there exist several innovators other than Samsung. Korea's industry structure is well-balanced with globally competitive sectors from traditional manufacturing to high-tech and science-based industries, such as textile, steel, shipbuilding, petrochemical, automobile, electronics, parts including secondary batteries and displays, and semiconductor industries. All the manufacturing sectors are export oriented. Korea is the world's 6th largest exporter of goods. Relatively recently, even a highly science-based sector like the biopharmaceutical industry has boomed in Korea. Although Korea does not have a *big pharma* yet, Korean firms are applying their capability in precise manufacturing and process innovations to the production of biomedicines. During the COVID-19 pandemic, new subsidiaries of big business groups like Samsung Biologics and SK Bioscience supplied vaccines successfully. In addition, the tragic Ukraine-Russia war made Korea's defence industry get attention from many countries. This year, Korea will be the world's 5th largest exporter of armaments.

Korea's strength in the private sector does not necessarily imply weak public activities. Korean government expenditure on R&D (GOVERD) far exceeds those countries that are far richer and more developed countries than Korea as the UK and France. With its legacy of strong government leadership in strategic R&D from the old, developing-country years, the Korean government still likes to carry out a bunch of 'national R&D programmes, which are mainly focused on applied technologies. On the other hand, the former Moon administration doubled the government spending on grant schemes for basic research in only 4 years, while keeping support to the IBS (Institute for Basic Science), which is for strategic large-group research. As a result, Korea's government R&D portfolio became similar to those of developed countries, even though it maintains its centre of gravity in supporting industrial R&D in firms. Government R&D programmes often push various players to form R&D consortia, by making it a requirement for being funded. Though being pushed, universities, government research institutes (GRIs), government agencies, large firms and SMEs work together as the *triple helix*. This helps improve transfer factors like technology transfer and spin-off start-ups. Without a strong financial sector, the government has been playing a role as a mother of venture capital funds, and government agencies are taking part as accelerators. An example, the TIPS (Tech Incubation Program for Start-ups) will be introduced later in this paper.

Certainly, Korea's innovation ecosystem has weaknesses. Not only many indices but also experts in and around Korea point out that Korea's innovation ecosystem lacks openness, particularly international collaborations. We need to understand here that, unlike the European Union, there is no regional body in East Asia to make member countries exchange scientists and students. Although Korea, China and Japan are neighbours and closely connected in terms of trade, they seldom collaborate in R&D and innovation at any level. To be precise, they see each other as competitors since their industrial sectors overlap. Korea's collaborations abroad in science and technologies are dominant with the U.S., based on informal links between individual researchers. The fluid mobility of personnel between different

organisations within Korea is another issue. To researchers with a doctorate, university positions are much preferred to GRIs and firms. Thus, the mobility of R&D personnel is one-directional, which results in broadening the gap between industry and academia.

Overall, Korea's well-performing innovation ecosystem seems to be based on its huge R&D expenditures in both private and public sectors. In other words, it has been input factors that made Korea a good performer in terms of the number of innovation outputs like patents and high-tech exports, while questioning the efficiency of the R&D system and the quality of innovation outputs.

Box 1. South Korea's performance in Innovation Related Indexes[1]

Index	Ranking	Description	Comment on China's Position
Innovation			
EIS – European Innovation Scoreboard (International comparison)	n/a	Index of 19 indicators grouped into 10 innovation dimensions in four groups: framework conditions, investments, innovation activities and impacts	Korea is the most innovative country. It performs 21 per cent above the EU in 2021. Korea has relative strengths in intellectual property applications such as PCT patent applications, trademark applications, and design applications. However, Korea has relative weaknesses in product or process innovators, innovation cooperation, and air pollution by fine particulate matter.
GII - Global Innovation Index	5 (of 132)	81 indicators grouped into 21 sub-pillars, 7 pillars (Institutions, Human capital and research, infrastructure, market sophistication, business sophistication, knowledge and technology output, and creative outputs)	Korea is one of the most innovative leaders in the world. Korea has strengths in human capital and research, business sophistication, knowledge and technology outputs, and creative outputs, but fewer strengths in infrastructure, market sophistication, and especially institutions.

[1] Sources: EIS: See https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/european-innovation-scoreboard_en#european-innovation-scoreboard-2021, GII: https://www.globalinnovationindex.org/Home ; Bloomberg: https://www.bloomberg.com/news/articles/2021-02-03/south-korea-leads-world-in-innovation-u-s-drops-out-of-top-10 and https://worldpopulationreview.com/country-rankings/most-innovative-countries; IMD: https://www.imd.org/centers/world-competitiveness-center/rankings/world-competitiveness/ , GCI 4.0: https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf; GEI: http://thegedi.org/tool/ ; GEM;: https://www.gemconsortium.org/reports/latest-global-report

Bloomberg Innovation Index	1 (of 60)	Less compressive and transparent (open) than EIS and GII "analyses dozens of criteria using seven equally weighted metrics, including research and development spending, manufacturing capability and concentration of high-tech public companies."	Korea ranked high in almost all indicators. All indicators are ranked in the top 4, and especially Korea ranks first in patent activity.
Competitiveness			
GCI (2019)	13 (of 141)	Global Competitiveness Index 4.0 measures national competitiveness—defined as the set of institutions, policies and factors that determine the level of productivity. The overall GCI 4.0 score is the average of the scores of the 12 pillars. In total, there are 103 indicators distributed across these 12 pillars. CGI 4.0 does not seem to have been updated since 2019.	Korea performs well in Infrastructure, ICT adoption, Macroeconomic stability, and Health, however, performs badly in the product market, and Labour market
IDM World Competitiveness index	27 (of 63)	Based on statistics and survey the capacity of countries to create and maintain an environment which sustains the competitiveness of enterprises is ranked based on 255 criteria and categorized into 20 sub-factors and in four main factors: Economic Performance, Government Efficiency, Business Efficiency and Infrastructure	Korea has relative competitiveness in Economic performance (high in employment), and infrastructure high in scientific infrastructure), on the other hand, it has less competitiveness in government efficiency and business efficiency.
Entrepreneurship			

GEM	27 (of 63)	Based on statistics and survey the capacity of countries to create and maintain an environment which sustains the competitiveness of enterprises is ranked based on 255 criteria and categorized into 20 sub-factors and in four main factors: Economic Performance, Government Efficiency, Business Efficiency and Infrastructure	Korea has relative competitiveness in Economic performance (high in employment), and infrastructure high in scientific infrastructure), on the other hand, it has less competitiveness in government efficiency and business efficiency.

Organisations

Innovations in Korea are supposed to be based on the pan-government alliances of the Ministry of Science and ICT (MSIT), Ministry of Industry, Trade, and Energy (MOTIE), Ministry of SMEs and Startups (MSS), Ministry of Education, providing R&D supports or regulation improvement for innovations. Experts often mention that Korea's innovation policy governance is fragmented, lacking a 'control tower' or a coordinating body for innovations. In previous several decades, the President's Office used to have a designated Chief Secretary or Presidential Advisor for science, technology and innovation. Those officials played a de-facto role in the innovation policy control tower since in a Korean version of the presidential system, the president and his/her office have bigger power than ministries, which enabled the coordination of innovation policies in a fragmented system. However, Korea's new Yoon administration has shrunk and downgraded the position to one secretary. There is a Vice Minister for Science, Technology and Innovation under MSIT, who is in charge of R&D budgeting and innovation ecosystem management. However, the vice minister's office sometimes struggles to coordinate other ministries, since it is a part of one of the fragmented groups of ministries that do innovation policies themselves. The vice minister's office has often been blamed for the Preliminary Feasibility Test for R&D programmes, which is a mandatory test by law for newly planned government projects that exceed a certain amount of budget. Many complain the test is not appropriate for R&D projects that are naturally uncertain and difficult to justify. Though fragmented, there have been paid many efforts to make ministries collaborate. There is the Council of Science and Technology-related Ministers that is chaired by the Prime Minister to deal with innovation policy topics together. Korea's multi-ministry cooperation sometimes, though not often, works. One good example will be introduced in section 5.

Under the support of the government, GRIs on socioeconomic policies and government agencies support the government in innovation policymaking. The KISTEP, Korea Institute of Science and Technology Evaluation and Planning, is a core organization to support innovation policies, especially for the Vice Minister for Science, Technology and Innovation. As the Korea Evaluation Institute of Industrial Technology (KEIT) and Korea Institute for Advancement of Technology are R&D support institutions under the MOTIE, KEIT has a role of planning, evaluating and managing industrial technology to achieve innovation in industrial technologies, and KIAT provides the policy development related to industrial innovations. The funding agencies are executive bodies of innovation policy. Their mission is not limited to the dissemination and management of government grants. They make policy inputs and they play an important role as bridges of communication between researchers, firms and government departments.

Some GRIs conduct policy research on innovation policy. There are Korea Institute for Industrial Economics and Trade (KIET) and Science and Technology Policy Institute (STEPI), among others. The KIET collects and investigates various trends and information regarding industries, technologies, trade, and regional industries to conduct policy research. Although it is not independent of the government, the STEPI should be regarded as the largest think tank in Korea that is dedicated to science, technology and innovation policy research. The STEPI works for many ministries, not to mention MSIT, but also MOTIE, MSS, and the Ministry of Economy and Finance (MOEF). And the STEPI is representing Korea as a delegation to international organisations like the OECD and APEC in the field of science, technology and innovation policy.
There are GRIs for scientific and technological R&D. There are 26 GRIs under the National Research Council of Science and Technology (NST) discipline-based, and there also are 14 research institutes under MOTIE by technological fields and more specific industrial sectors. Those GRIs hold experts who actively

carry out R&D projects, thus they can provide the government with sectoral and domain knowledge such as technological trends and confronting tasks.

At a regional level, in every local autonomous entity (local government), there are 17 Technoparks as established with the joint participation of central government and local governments for enhancing the competitiveness of local firms. They focus on incubation and technical support, but they gradually expand their function to include regional innovation policies, business planning, and corporate support services. Since local governments do not have enough legislation and taxation right and lack financial independence from the central government, R&D and innovation-promoting activities are considered as central government's jobs. So, Technoparks are not quite local, instead, they are more executive branches of central government than local agencies.

Tech Incubator Program for Startups (TIPS) is a program of private investment-led technology startup support. In plain words, a private actor can make an application to the government for becoming a carrier of the program. It supports successful commercialization by providing various supports that startups need, such as funds, incubation by operators, follow-up investment, etc. TIPS operator is a private investment institution consisting of angel investment, and venture capital specializing in early-stage companies, and Korean tech giants.

Processes

Korea’s policy framework consists of laws, rules, presidential orders, and following official plans including legal 'basic plans' that are normally set for five years period. In addition to those, every new administration does develop and announces its 'national policy tasks' at its beginning. Korea's presidential tenure is five years with no chance of reappointment. There is an official basic plan for science and technology policy, but there is no official plan for comprehensive innovation policy. In June 2022, the new 'National R&D innovation law' began to enforce. However, it is not clear that this law is about innovation policy. The contents of the law are about innovating R&D administration, for instance, abolition of micro-regulations on R&D spending, strengthening security, flat-ironing bumps of rules that were set by different ministries, etc. The Vice Minister for Science, Technology and Innovation is in charge of this law, and it is reasonable to say this law aims to promote R&D performance by improving the national innovation ecosystem. At the moment, the Vice Minister's office needs to establish a comprehensive innovation policy framework to organise and synchronise innovation-related activities in different ministries. One precondition is to have capabilities in innovation policy not only in the ministries but also in the policy research community, which is much smaller than it should be, considering the scale of R&D activities in Korea.

In June 2022, the MOTIE announced ‘Innovation Strategy for Industrial Technologies’. It suggested five major agendas: 1) Mission-oriented R&D, 2) Challenging and innovative R&D, 3) Accumulation of R&D capacity, 4) Regulatory reform, for instance, the preliminary feasibility test, 5) Globalisation of R&D. It is rather R&D policy than innovation policy. Furthermore, the MOTIE's agendas are now hard to be differentiated from those of the MSIT. But there cannot be found a responsible body that mediates and organise those two ministries and overall innovation policy.

The Presidential Advisory Council of Science and Technology (PACST) is by law at the highest level of agenda setting in STI policy, so the mediation role is expected to be taken by the PACST. However, the council members of civilian experts who represent various interest groups in the field of S&T and industries, are unlikely to have proper capabilities not only for innovation policy making but also in holding leadership for coordinating ministries. The agenda-setting process in the PACST consists of five steps; 1) a member in a subcommittee of the council raises a candidate agenda, 2) selection of candidate agenda at the council meeting, 3) policy research by an external researcher by contract, 4) review of policy report by the council, and 5) adoption of the content and summarize for the report to the president. Not all presidential reports are implemented through government programmes. More often than not, the initial ideas came from the member's interest, or from a ministry that wants to bypass the persuasion process with other ministries. In short, the PACST is far from the highest-level organisation for coordination or decision-making in innovation policy. The lack of coordination in innovation policy is something to take action on, especially in such a country that spends a lot of taxpayers' money on R&D.

One more thing to note is the weakness of the National Assembly in policy making. Although Korea's political system resembles that of the U.S., the role of the National Assembly is more like those of European nations with a parliamentary government. In Korea, ministries do policies and the Assembly does politics.
There are numerous expert committees and forums in and around many ministries and agencies. It should be good to have conversations to share ideas and to understand each other. Thanks to relatively small expert communities, they have a common perception of policy problems. In many cases, their

consensus for government interventions is made with no trouble. With the consensus, the acceptance of policy customers leads to compliance, so that the policy can work as intended.
Compared with the hustle in agenda setting, policy making and budgeting, ex-ante evaluation is not very critically carried out. One positive aspect of generous evaluation should be that we look forward and invest energy into making new projects. On the other hand, weak evaluation makes it difficult to learn lessons and accumulate experiences.

It is interesting to observe that Korean large firms are busy doing global business and they are not very interested in affecting innovation policy. They often try to influence labour market policy, competition rules and environmental regulations, particularly for emerging business models such as platform business or distributed power generation. But they seldom challenge government R&D spending, technology transfer scheme or IPR issues. However, recently there is a big debate on human resources in the semiconductor industry, Samsung Electronics and SK Hynix have asked for increasing semiconductor technologies as an academic major in universities and raising a special quota of students, which is controlled by the Ministry of Education.

Content

In Korea, there is an increasing number of people who talk about innovation policy. However, the terms S&T policy and industrial policy are still very popular and familiar to policymakers, interestingly the latter has never been a term to avoid. Korean government used to be very directive to industries. In the MOTIE, there still exist departments that match industrial sectors respectively. But the MOTIE has been making moves towards innovation policy. R&D, demonstration projects, facilitating knowledge transfer, and regulation reform are becoming priority policy instruments rather than subsidies and directions. It is possible to say the MOTIE gets similar to the Department for Business, Energy and Industrial Strategy of the UK. One different thing is, that there is a dedicated ministry for S&T and innovation, the MSIT in Korea. Having innovation policy in common, the two ministries collide more often than before. The Ministry of Education also takes a part, trying to keep its role in promoting innovations in universities.

As mentioned, Korea's innovation ecosystem is evaluated as well-performing. But the measures and indices are based on the innovation system perspective. In the European and British innovation policy research community, the concepts of the transformative innovation policy (TIP) and the mission-oriented innovation policy (MOIP) have been paid much attention to, not only by academia but also by governments and international bodies. To respond to the transformation to a carbon-neutral society and the digital transformation, the Korean government launched two mega programmes, the Green New Deal and the Digital New Deal, respectively. The government may claim that those programmes are examples of Korea's approach to transformative innovation policy. But in reality, they consist of mostly input factors-oriented policies as the title 'new deal' implies and lack civil participation and considerations of sociotechnical components of transition.

The MOIP approach suddenly takes a centre stage in the new Yoon administration. This phenomenon is due to the Tech Cold War between the U.S. and China, triggering the reform of global supply chains. To Korea, it became a national mission to solidify *technology sovereignty*. Besides, through the adoption of the MOIP terminology in a broad way, Korea’s S&T policy and industrial policy are rapidly fusing into innovation policy.

Good Practices

The followings are four examples / good practices of recent innovation policy in Korea. These examples are deliberately selected to provide readers with Korea's efforts to improve weak points of its innovation ecosystem or to enhance its strengths even further. Example 'a' shows both the possibility of the MOIP and inter-ministry cooperation under one mission in Korea's fragmented system. Example 'b' presents a case that a public-private partnership for a dynamic and vibrant start-up ecosystem, which is a new trial for a country with a government-leading tendency. Example 'c' is about the demand-side innovation policy. As mentioned, Korea's strengths are based on input factors like R&D expenditure, in other words, supply-side instruments. Institutionalising public procurement of innovation (PPI) is still ongoing, but it tries to redefine government as a customer of innovations. Lastly, example 'd' is about high-risk and high-return industrial R&D, benchmarking the DARPA[2] of the U.S. Now Korea is one of the most advanced countries, so there are few countries to follow or catch-up with. Since Korea's so-called 'fast second' action will no longer be valid, Korea is set to start risky, challenging and innovative R&D projects, to reduce risks and uncertainties in the private sector.

Policy mix for overcoming the Korea-Japan trade dispute on semiconductor materials

In July 2019, when the Japanese government started export restrictions to Korea on three key materials for semiconductor display production and excluded Korea from the white list, a red light was turned on in the supply chain of Korea's major export industries. As Korea was excluded from the whitelist, the export simplification process that was taken for 857 non-sensitive items out of 1,120 items of strategic materials prescribed by the Japanese government disappeared. Japan's export control is an external risk that restricts trade for political reasons, and the ripple effect can affect the overall Korean manufacturing industry. It is different from other supply chains risk in that it can be continued cumulatively and in stages in the future.
The Korean government urges the Japanese government to separate economic and trade issues from political and diplomatic issues and takes it to WTO for measures to restrict exports of three items. In the short term, the Korean government provides financial support, introduces tariff rate quota, and improves regulations, and also in the long term, it implements policies that provide incentives for localization (internalization) and supply chain diversification by industry/sector through R&D.

The Korean government imposes emergency actions such as providing information through the establishment of a dedicated website, operation of real-time response centres by departments, and one-stop solutions to corporate difficulties to minimize corporate damage. And they operate an organization dedicated to rapid customs clearance for short-term supply stabilization. The government prepares fundamental action to strengthen core technology and industrial competitiveness and improve the constitution as well.

For the long-term project, the Korean government establishes a strong promotion system through the proposal of amendments to the Special Act on the materials, components, and equipment industries and the establishment of a Competitiveness Committee.

In terms of human resources cultivation, the government supported the cultivation of excellent research manpower by reorganizing the industry-university-research manpower exchange system and

[2] Defense Advanced Research Projects Agency

strengthening employment linkages through education programs and especially focused on securing excellent research manpower in small and medium-sized enterprises (SMEs).

All the policy instruments have been discussed and coordinated in a single task force committee, which was co-chaired by the Chief Secretary of the president's office and the vice minister of the Ministry of Economy and Finance. Almost all director generals in many related ministries have participated in the committee meeting. Different ministries worked together in a collaborative, division-of-labour manner, under one given mission of overcoming the trade crisis and securing supply chains for the semiconductor industry.

TIPS

The Tech Incubator Program for Start-ups (TIPS) started in 2013, and it is a program to facilitate start-up activities by helping them pay for R&D and hire advanced technology-related workforces. This program is designed to identify promising start-ups and provide them with governmental financial support for R&D and arrange investments (angel investments or venture capital).

By the end of October 2021, it has selected and supported a total of 1,442 start-ups[3]. It has invested KRW 322.6 billion in private angel investments, KRW 593.6 billion in government-funded R&D, KRW 82.2 billion in start-up commercialization and KRW 56.2 billion in overseas marketing over the 2013-2021 period[4].

According to a study conducted by the Science and Technology Policy Institute (STEPI) in 2019, 89 out of a total of 165 start-ups (53.9%) that joined this program turned out to be “successful” during the 2013-2017 period. Successful start-ups in TIPS program achieve at least one of the criteria such as annual sales of over KRW 1 billion, an annual export amount of USD 500K or more, more than 20 full-time employees, attracting follow-up investments in recent 3 years, M&A over KRW 1 billion, or IPOs in KOSDAQ including KONEX.

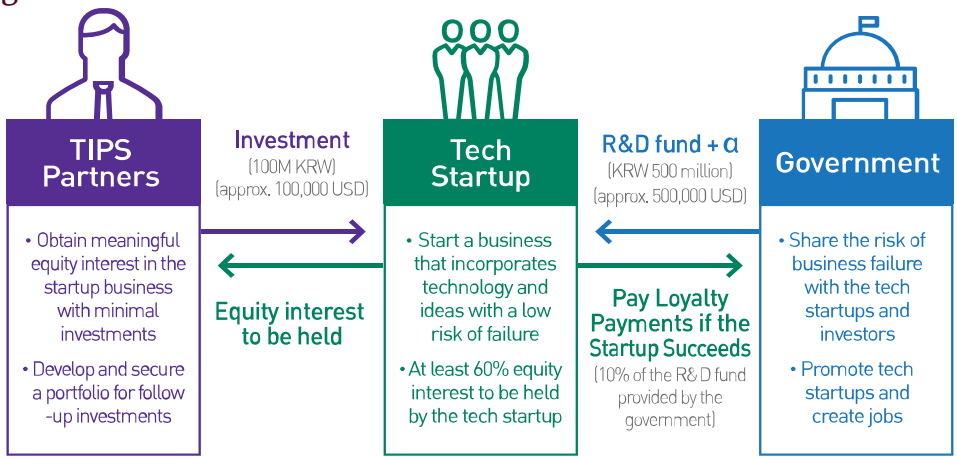
TIPS programme budget[5]

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Programme Budget in billion KRW (million USD)	3 (2.5)	26 (21.7)	28.2 (23.5)	53 (44.2)	94.7 (78.9)	162.2 (135.2)	145.4 (121.2)	195.1 (162.6)	189.6 (158)
Number of Newly Selected Start-ups	15	39	79	85	205	256	250	300	400

Start-ups that received support from TIPS showed statistically significant increases in their assets, wages, R&D investments, patents and intellectual properties, but the increase in sales did not show any statistically significant results.

[3] Source: https://www.korea.kr/special/policyCurationView.do?newsId=148865474
[4] Source: STEPI (2019). The data for the period 2019-2021 is based on the TIPS Support Plan Announcements (2019-2021) available on the Ministry of SMEs and Startups website (https://www.mss.go.kr/).
[5] Source: https://www.korea.kr/special/policyCurationView.do?newsId=148865474

TIPS programme scheme[6]



Public procurement for innovation (PPI)

The concept of public procurement for innovation (PPI) had been suggested by innovation policy research communities, especially in northern Europe (Edler and Georghiou, 2007). PPI emphasise the efficiency of both public procurement and government support to R&DB in the private sector. It has spread to several European countries, and it is regarded as a success. PPI aims to create and realize new value and was included as a new task in the 2019 Comprehensive Government Innovation Promotion Plan. This policy is to change the role of the government from a consumer who purchased on-the-shelf goods, to a promotor, i.e., prosumer who demands technological innovation in the private sector. PPI policies focus on improving innovation incentives, linking R&D results to public procurement, and fixing the asymmetry between demand and supply information to overcome existing limitations such as bias on specific product groups.

In the following year, the Public Procurement Service announced the promotion of Strategic Public Procurement in its work plan, and accordingly, the operation and purchase budget for the innovative prototype purchase business were expanded, and various measures such as exempting innovativeness evaluation for products approved for suspension of the regulation (sandbox) has been prepared.

Apart from the existing online system, the Korea online e-Procurement System, which handles the entire procurement process of public institutions, the Innovation Market, a public innovation procurement platform, opened in February 2020 to provide an early entry market for innovative products and it directly connects the innovation demand of public institutions with the innovative products of companies. It is a single channel for innovation procurement and includes functions such as information sharing between suppliers and consumers and discovery of innovation demand as well as innovative product transactions. There are three types of fast track I (R&D results of each ministry), II (Prototype of Public Procurement Service), and III (NET (New Excellent Technology), NEP (New Excellent Product) recommended by each ministry) in the process of accrediting innovativeness and publicness.

[6] Source: http://www.jointips.or.kr/global/

Nevertheless, the remaining issues for the Innovation Market are that the creative new demand discovery is limited, the contribution of buyers to innovation is not significant enough, and as most of the products in the Market are consumer goods, its innovativeness is unlikely to affect private demand. Therefore, to solve this weakness of the Innovation Market, the Innovation Market must sell products with high innovation diffusion power, which should be improved in the future.

The *Alchemist* programme and its siblings

The Alchemist programme challenges innovative technology development, although it is less likely to finally succeed. It is launched by the MOTIE in March 2019. The Alchemist project is to develop technologies that have great impacts by providing solutions to confronting industrial challenges. As a pilot project in 2019, 10 billion KRW (~7.3m USD) was invested in five areas: robotics, future automobiles, high-tech equipment, renewable energy, and energy efficiency. It plans to invest 600 billion KRW (~44m USD) over seven years, together with the MSIT.

Project tasks are selected by the Grand Challenge Committee, which consists of 60 experts. By introducing tournament-type R&D, three institutions are selected for preliminary research in the first stage and supported for two years parallelly, and then only one institution of excellence will win 25 billion KRW funds for five years in the second stage. The final evaluation is conducted in the form of a performance presentation without an evaluation grading, allowing failures.

Even with the Alchemist programme, the MOTIE is working on launching another programme to respond to 'grand challenges', including broadening the 'super gap' beyond China's chasing, by creating disruptive innovations. This new project is preliminarily called 'the Mega Impact Project', which will select ten target technologies in late 2022. The *Innovation Challenge Project* is an MSIT version of the *Alchemist*, though smaller. The MSIT wanted to start a Korean version of DARPA, say K-ARPA for futuristic, innovative, and mission-oriented research. One of the selected research subjects is data storage using DNA molecules. Those projects show, even with new decoration wraps and rationale, that Korea's innovation policy approach is still dominated by the legacy of the so-called 'select and concentrate' strategy. Maybe, Korea's 'select and concentrate' was the authentic mission-oriented approach, which European countries have long wanted to adopt.

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