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Innovation Policy for the Fourth Industrial Revolution

A Comparative Study of the Cases of Japan and South Korea

Topic and Research Question

In the light of a widening gap in innovation performance between Japan and South Korea (henceforth Korea) and considering the importance of strategies and technologies related to the Fourth Industrial Revolution (FIR) as drivers of innovation, this thesis aims to analyze the similarities and differences of the two countries' current innovation policy strategies directed at furthering the FIR. The objective is to enable the evaluation of policy regimes currently in place by allowing for a direct comparison of the policy mixes proposed by the country cases, as well as to shed some light on how variations in policy strategy can explain differing levels of national innovation performance. By conducting an in-depth analysis of Japan's and Korea's national policy frameworks and by comparing them, this study sets out to enable both the scholarly field as well as policymakers to gain a better understanding of how the countries' respective policy mixes are composed, and how their differences might explain variations in national innovation performance. The research question devised to approach this comparison is:

What are the similarities and differences of Japan's and South Korea's public policy approaches towards strengthening innovation processes aiming at furthering the Fourth Industrial Revolution, and how can the countries' choice of policy instruments explain their difference in innovation performance?

State of the Art

The existing literature analyzing innovation policy largely draws on the concept of (national) systems of innovation, according to which innovation is facilitated not only through educational efforts and research and development (R&D), but also through other learning processes that are part of regular economic activities (Edquist 2005). This theory further emphasizes institutions and the crucial role which production and consumption hold in driving innovation (Edquist & Hommen 1999; Lundvall 2010).

Understanding the interconnection between science, technology, the economy, and the demand side are suggested to be crucial factors in designing innovation policy (Lundvall & Borrás 2005). The different types of policy instruments utilized to drive innovation have been categorized as regulatory, economic, and soft measures (Borrás & Edquist 2015). Furthermore, areas such as R&D provision, competence building, innovation financing, forming new product markets, articulating demand-side requirements, organizational and institutional changes, or investment schemes have been identified as key activities defining given national systems of innovation (Edquist & Hommen 2008).

Literature comparing FIR policy on a cross-national scope has to some degree been published, such as a systematic literature review covering academic contributions (Liao et al. 2018), a numbers-based approach that contrasts policy scopes on a quantitative level (Lin et al. 2017), and a study that highlights major policy trends shared by a large number of sample countries (Hutschenreiter et al. 2019), analyses on a policy level have however not been provided.

Methodology and Approach

Based on the findings of the literature review and premised on the concept of national innovation systems, an analytical framework incorporating a total of 28 possible policy instruments has been devised. Encompassing the areas knowledge creation, information diffusion, skill development, regulatory adjustments, business environment, and demand-side measures, this conceptual framework was designed to cover all possible areas of innovation policy intervention. The policy instruments introduced in this paper evolve around the following policy fields:

- *Creation of knowledge and public R&D*
- *Information diffusion and technology adoption*
- *Human capital and skill development*
- *Financial incentives to enterprises*
- *Competition, intellectual property, and standards*
- *Public procurement and public services*
- *User involvement in the innovation process*

(Refer to pages 43-5 of the full version of the MA thesis for a complete overview of the proposed policy instruments.)

In a next step, the public innovation policy approaches put forward by the Japanese and Korean governments were examined in accordance with this methodological framework, and its has been determined whether the utilization of each individual policy instrument is suggested or not within the respective national FIR approaches.

Main Facts

Although the Japanese and Korean approaches have shown to be widely similar across most policy areas, they significantly differ from each other in some distinct fields. Intervention areas in which innovation policy suggestions have been identified as largely similar are those aiming at facilitating the diffusion of information and adoption of technology, the provision of financial incentives to private businesses, the adjustment of standards and competition regulation, and the involvement of users in the innovation process. A slightly higher degree of divergence between the countries' strategies was found in the field of human capital and skill development. The largest differences were identified in the areas of knowledge creation and public R&D as well as public procurement and public services.

The following list highlights all areas, on a policy instrument level, in which the suggestions made by the two countries' policy frameworks differ from each other:

Promoted by Japan only:	**Promoted by Korea only:**
Direct funding, competitive research funding, block grants	Establishment of technology transfer alliances between re-search organizations, provision of knowledge networks & knowledge markets
Provision of physical research infrastructure	Incentivizing vocational training / on-the-job training / apprenticeships / learning by doing
Promoting multi- & interdisciplinarity, promoting international cooperation	Asset financing & debt and equity financing through loans / loan guarantees / credit loans / credit guarantees / advances / research grants / equity investment / risk capital / risk-sharing / mezzanine funding
Fostering entrepreneurship / communication skills / problem-solving skills, provision of business accelerators	Public procurement through R&D contracts / government contracts & purchases / prototype purchasing, establishing public markets
Adjusting migration regulation, facilitating foreign workers' access to domestic labor market, addressing reverse brain drain, enhancing global mobility	
Soft instruments such as CoCs / voluntary technical standards / shaping cultural & social norms	

Table 1: Based on "Table 3: Differing Policy Tools" (p. 142) of this MA thesis

Results

Similarities and differences: Overall, the results of the analysis show that while every possible policy instrument is promoted by at least one of the two country cases' FIR innovation strategies, more than a third of all policy instruments is applied by only one of the two. Although the countries' strategies widely concur across a large part of policy areas, substantial differences can be found in the fields of public knowledge creation and R&D as well as with regard to public procurement and public services.

Differing innovation performance: It is argued that the causes for divergence in innovation performance are to be found within those differing policy instruments. However, since factors aside from the analyzed FIR innovation policy strategies also influence how countries fare in fields such as knowledge creation or public procurement, the higher-ranking country's approach identified in this study cannot be considered as being categorically more effective in improving innovation performance. The policy fields in which differences have been identified should instead be regarded as areas in which adjustments can lead to change in innovation performance.

Similar but different: The analysis has also shown that for some cases in which the proposed measures are seemingly similar, dissimilarities can exist on a more subtle level, such as differing policy execution approaches.

The thesis' findings indicate that Korea's FIR innovation policies are not simply to be adopted by Japan in order to increase innovation performance. Rather, the policy areas in which differences have become apparent should be further investigated, and a reevaluation of current policy strategies in those fields should be considered.

References

All references can be found in the full version of the MA thesis available at http://othes.univie.ac.at.

About the Author

Simon Psenner holds a BA in Japanese Studies from the University of Vienna and has spent four semesters as an exchange student at Tokyo Metropolitan University. He has gained work experience in the business development and consulting sectors in Japan, the UK, and Austria.

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Examination Date: 21.06.2021