

Promoting Regional Competitive Industries through Cross-Sectoral Inter-Organizational Collaboration

— Platform Policy for Constructing Regional Advantage —

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0. Introduction

Region is increasingly becoming a key component for considering economic and industrial development. Today, through restructuring and reorganizing the relationship between industry, university, government, and even civil society, promotion of new and competitive regional industries are undertaken in many areas in the world.

In this study, firstly, why region is focused and what is the competitiveness of regional industries are considered. Then, the concept of “Constructing Regional Advantage (CRA)” is introduced and discuss the approach and platform policy for CRA which aims to promote regional competitive industries through cross-sectoral inter-organizational collaborations. Lastly, how to promote regional competitive industries is considered by focusing on actors, their role and policy elements.

1. The definition of competitiveness of regional industries

(1) Why regions are focused?

Region is conceptually regarded under the level of country but above the local or municipal level, and is signified as an administrative division to govern policies for economic development (Cooke and Leydesdorff, 2006, p.2). Today, region is increasingly recognized as a key component for economic development (Passona, 2013, p.101; Kitson et al., 2004, p.991), hence, became a locus for patterns of innovation, its processes and competitiveness in the globalizing economy (Fiore, et al., 2011, p.1400). This is because regions, as is stated by EUROPEAN COMMISSION (1995), “the best level for contacting enterprises and providing them with the necessary support for the external skills they need (resources in terms of manpower, technology, management and finance). It is also the basic level at which there is natural solidarity and where relations are easily forged (p.45)”. On this point, EUROPEAN COMMISSION (2006, p.29) also indicates, re-

gion is strategically important for constructing its advantage, however at the same time, it also points out that since regional innovation systems are open, socially constructed and linked to global, national and other regional systems of innovation, it is necessary to employ multi-level approach to innovation and governance.

(2) What is competitiveness of regional industries?

Based on the arguments above, this study focuses on competitiveness of regional industries with reference to the literature about “regional competitiveness”. Cellini and Soci (2002) indicate competitiveness of an industrial district is developed at meso-level which includes elements of macro and micro level, however, the concept is complex and elusive. It is also indicated that there is no unanimous agreement concerning the definition and the framework to consider regional competitiveness (Borsekova et al., 2012). In this regard, Cellini and Soci (2002) propose that regional competitiveness is more than the potential ability to export or trade surplus and “include different economic elements, demographic and social aspects (p.90)”.

Based upon the complexity about the definition of regional competitiveness, on the premise of promoting industrial and economic development of regions, some studies show the “drivers” and the “goals” for regional competitiveness. Firstly, regarding the drivers, Kitson et al. (2004, p.994), based on the argument by Camagni (2002) and EUROPEAN COMMISSION (1999), indicates regions which have competitive advantage have common features in terms of superior assets which are external to individual firms but benefit to them for higher productivity. They show dimensions of the regional socio-economy such as human capital, social/institutional capital, cultural capital, knowledge/creative capital, infrastructural capital (p.994). Secondly, Passoa (2013, p.105) also shows the drivers of regional competitiveness such as environmental resources, the local milieu, factor market, global market, legal infrastructure, physical infrastructure. In addition to these factors, Viassone (2008) stresses a well-functioning financial system for economic growth. These authors conclude that these drivers support and strengthen a productive basis for regional economy. On the other hand, concerning the goal, firstly, Kitson et al. (2004, p.995) show the drivers above contributes to regional productivity, employment and standard of living. Pessoa (2013, p.107 ~ 8) also indicates that looking merely at productivity is misleading because there are problem of accuracy of measurement and theoretical concerns about the interpretation to consider the real regional productivity. He proposes to recognize regional competitive advantage in the dynamics in “i) sales of local products in contested external markets, ii) use of local assets (people and other endogenous resources) in an efficient way, iii) adding value to its firms and workers which means to maintain or increase employment (p.107)”. Moreover, with reference to Porter (1998)’s argument about cluster, Pessoa (2013, p.108) concludes improvement of innovation capacity through productive use of inputs is essential for regional competitive advantage. The drivers and the goals for regional competitiveness are summarized as follows (Table 1).

Table 1. The Drivers and the Goals for Regional Competitiveness

Drivers	Goals
<p>Superior Assets:</p> <ul style="list-style-type: none"> - human capital - social (including network)/institutional capital - cultural capital - knowledge/creative capital - infrastructural capital (Kitson et al, 2004) - environmental resources - the local milieu - factor market - global market - legal infrastructure - physical infrastructure (Passoa, 2008, 2013) - well-functioning financial system (Viassone, 2008) 	<ul style="list-style-type: none"> - regional productivity, employment and standard of living (Kitson et al, 2004) - regional competitiveness (dynamics in: sales, efficiency, employment) (Passoa, 2013) - improvement of innovation capacity (Passoa, 2013)

Source: Drawn up by author with reference to Kitson et al. (2004), Passoa (2008, 2013), Viassone (2008).

2. How to promote regional competitive industries?

(1) The concept of “Constructed Advantage”

Concerning how to promote regional competitive industries, firstly, Porter (1990, p.19) indicates that competitive advantage is created and sustained through a highly localized process. Moreover, with reference to Maskell, (1998), Brioschi et al. (2005), Pinch et al., (2003), Viassone (2008) indicates that “the key resources for regional competitiveness depend on localized processes of knowledge creation, in which people and firms learn about new technology, learn to trust each other and share and exchange information (p.9)”.

Based on these ideas, the concept of “Constructed Advantage” is introduced as an approach to create constructing regional competitive advantage. Cooke and Leydesdorff (2006) define Constructed Advantage as “both a means of understanding the noted metamorphosis in economic growth activity and a strategic policy perspective of practical use to business firms, associations, academics, and policy makers (p.7)”.

(2) Approaches and key dimensions of “Constructing Regional Advantage (CRA)”

Approaches for CRA

The report by EUROPEAN COMMISSION (2006) recognizes Constructed Advantage “as the next evolutionary step in regional economic development (p.12)” and discuss some key elements for Constructing Regional Advantage (CRA).

Firstly, understanding initial conditions of a region is necessary to consider policy options which are often limited by historical trajectory of a region. Here the report indicates regional

endowments such as historical and geographical background and economic and socio-institutional and political conditions should be taken for consideration. More concretely, as initial conditions to be considered, it introduces typology of regions¹, as well as individual factors such as an access to natural resources, the degree of centrality and connectiveness with respect to its geographical location, the size of its population, the quality of regional communication infrastructures, the knowledge base strengths of the region, and evolutionary processes based on path dependent technological trajectories. Here, it is presumed that “true regional innovation system connectivity is not complete in most regions (p.33)”.

Secondly, the report proposes the following basic approaches for creating CRA:

1) Own solutions for particular region or regional firms’ needs have to be provided (p.30) because each region has different economic and socio-economic environments. In this point, Asheim et al. (2011, p.894) also indicate that one-size-fits-all regional policy models do not work.

2) The report also calls to change firm’s behavior being more innovative and taking more dynamic role by public sector including universities (p.19). It is suggested that a more platform and system-oriented as well as a more proactive innovation based regional policy should be promoted by the public sector (p.16, 73). Moreover, promotion of public-private partnership, policy intervention for reducing interaction or connectivity deficit, co-occurring of business interactions and knowledge flows need to be encouraged (p.31).

3) Cooke and Leydesdorff (2006, p.10) propose that CRA need to embrace new dynamics of innovation and the capacity to exploit them, so it requires interfacing developments in various directions such as economy, governance, knowledge infrastructure, and community and culture (Table 2).

The report indicates that the regional policy has to be considered in a mosaic and need to be

Table 2. A Synthesis for Constructed Advantage

Economy	<ul style="list-style-type: none"> - regionalization of economic development - ‘open systems’ interfirm interactions - integration of knowledge generation and commercialization - smart infrastructures; strong local and global business networks
Government	<ul style="list-style-type: none"> - multi-level governance of associational and stakeholder interests - strong policy-support for innovators - enhanced budgets for research - vision-led policy leadership - global positioning of local assets
Knowledge Infrastructure	<ul style="list-style-type: none"> - universities, public sector research, mediating agencies, professional consultancy, etc. have to be actively involved as structural puzzle-solving capacities
Community and Culture	<ul style="list-style-type: none"> - Cosmopolitanism - Sustainability - talented human capital - creative cultural environments - social tolerance. <p>(Providing a background for the dynamics in a Triple Helix of university-industry-government relations)</p>

Source: Cooke and Leydesdorff (2006, p.10)

built with pieces which are not pre-determined (p.13). Therefore, the report stresses, as key importance, the recognition of institutional and governance capabilities in regions (p.33), which enable to take variation of key elements into account, then, to find own solutions.

Key dimensions of policy model for CRA

Considering the policy model, three key dimensions; related variety, differentiated knowledge bases, distributed knowledge networks, are proposed as requirements for CRA (EUROPEAN COMMISSION, 2006; Asheim, 2011).

Firstly, related variety is accounted for spillover effect, i.e. knowledge spillover between sectors related in terms of complementary knowledge and competences. The report by EUROPEAN COMMISSION (2006) proposes that CRA based on related variety “may combine the advantages of regional specialization in complementary sectors (including knowledge spillovers) with the advantages of regional diversity, dampening the risk of sector-specific shocks (p.46)”.

Secondly, differentiated knowledge bases comes from the recognition that “the innovation process of firms and industries is strongly shaped by their specific knowledge base (EUROPEAN COMMISSION, 2006, p.45)” and the report suggests “One way of analyzing regional diversity with regard to its implication for regional economic development is to apply an industrial knowledge base approach (p.48)”. Here, Asheim et al. (2011, p.896 ~ 897) introduce three types of knowledge bases, “analytical (pursuing natural science/know-why)”, “synthetic (which is integrative knowledge creation and pursuing engineering science/know-how)”, and “symbolic (pursuing aesthetic attributes of product)” (Table 3). They indicate that most activities are comprised of more than one knowledge base, however, the degree to be dominated by certain knowledge bases is dependent on the characteristics of the firms and industries (p.898).

Table 3. A Typology of differentiated knowledge bases

Analytical (science based)	Synthetic (engineering based)	Symbolic (artistic based)
Innovation by creation of new knowledge	Innovation by application or novel combination of existing knowledge	Creating meaning, aesthetic qualities, affect; know who critical
Importance of scientific knowledge often based on deductive processes and formal models	Importance of applied, problem related knowledge (engineering) often through inductive processes	Creative process
Research collaboration between firms (R&D department) and research organizations	Interactive learning with clients and suppliers	Learning-by-doing in studio, project teams
Dominance of codified knowledge due to documentation in patents and publications	Dominance of tacit knowledge due to more concrete know-how, craft and practical skill (Partially codified knowledge)	Strong semiotic knowledge content, some forms highly context-specific
More radical innovation	Mainly incremental innovation	—
(Example of Industry) Drug development	(Example of Industry) Mechanical engineering	(Example of Industry) Advertising

Source: Drawn up from Asheim et al. (2011, p.898; Table 1) and Asheim and Coenen (2005, p.1174; Table 1).

Lastly, distributed knowledge networks is oriented to the transition from an internal knowledge base of firms to globally distributed knowledge networks and open innovation (Chesbrough, 2003). Here the report by EUROPEAN COMMISSION (2006, p.50) suggests that knowledge flows can take place between industries of different degrees of R&D-intensity and different knowledge bases. The report also stresses that it is still important to distinguish between locally/regionally versus globally distributed knowledge networks for production of goods and services. Moreover, Giuliani (2005, p.1) indicates heterogeneity of firms' knowledge bases where knowledge is unevenly distributed accelerate selective inter-firm learning. In this context, as Asheim et al. (2011, p.898) propose, firms increasingly need to acquire new knowledge to complement either by attracting human resource of different knowledge base or by collaborating with external organizations, therefore, importance of absorptive capacity of firms becomes to be focused. Moreover, they also indicate the importance to understand the effectiveness of "how different knowledge bases are combined and intertwined in a dynamic manner between firms and industries of related variety (p.899)".

(3) Platform policy for CRA: building "Regional Innovation System (RIS)" based on "Triple-Helix model"

Platform policy for promoting CRA

As a policy for promoting CRA which is based on the dimensions above, trans-sectoral platform policy is proposed. Asheim et al. (2011) explain the essence of a platform policy "represents a strategy based on related variety, which is defined on the basis of shared and complementary knowledge bases and competences. Moreover, this approach also clearly illustrates that knowledge is distributed across traditionally defined sectors in distributed knowledge networks (p.901)." The report by EUROPEAN COMMISSION (2006, p.21) also indicates the effectiveness of platform policy for learning aiming for behavioral value-added such as role of knowledge creation, absorption and diffusion under well-structured local and global knowledge flows. The report (p.16 ~ 17) explains that platform policies create more scope and flexibility, while needs connectivity and the creation of systems, therefore, have to include various actors, agencies and structures for strengthening territorial competence bases which include people, business climates, regional knowledge infrastructures, SME and entrepreneurship policies, and governance dimensions of upgrading and building regional innovation systems as creative knowledge environments. Based on these recognition, the report proposes "the need for more platform and system oriented as well as more pro-active innovation based regional policy in order to construct regional advantage (p.69)".

Building "regional innovation system (RIS)" based on "Triple-Helix model"

Concerning how to promote CRA through platform policy, the report by EUROPEAN COMMISSION (2006, p.17) shows the concept of Triple-Helix where university, industry and government collaborate and poses the key question how the collaboration is organized externally and how knowledge creation and innovation oriented work is organized internally among different parties. Triple-Helix is the model proposed by Etzkowitz, and Leydesdorff (1997) as an innovative dynamic model which is to capture multiple reciprocal linkages at different

stages of the capitalization of the knowledge (p.1)” through technology transfer, collaboration, and conflict moderation among the three actors. Ivanova (2014) explains “these three sub-dynamics.....exchange among themselves functions of knowledge production, wealth creation, and normative control (p.359)”. Ranga and Etzkowitz (2013, p.238) explain the “functions” described as processes taking place in “Triple-Helix spaces” where knowledge, innovation, and consensus are performed.

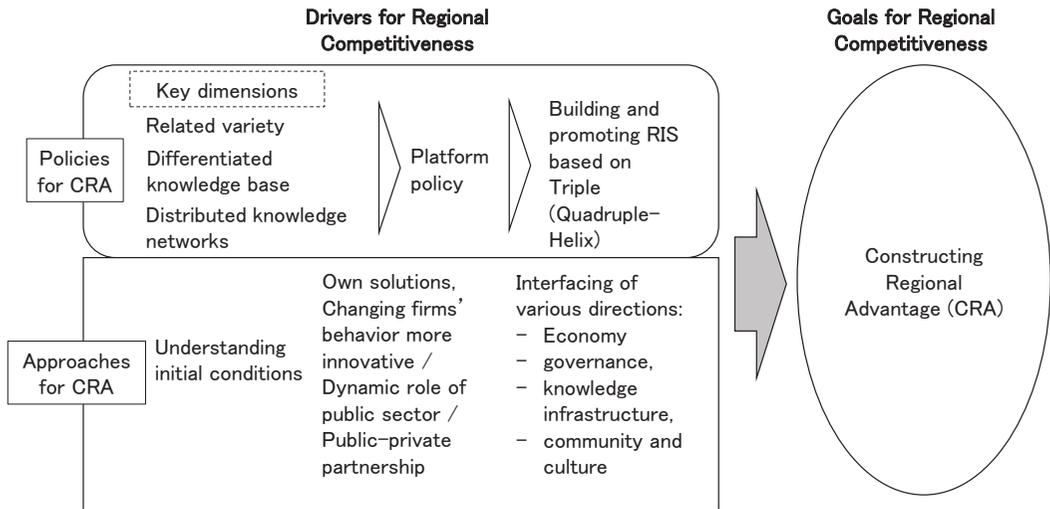
The report by EUROPEAN COMMISSION also proposes the importance of building and promoting regional innovation system (RIS) and strengthening territorial competence bases. Asheim and Coenen (2005) explain RIS “can be thought of as the institutional infrastructure supporting innovation within the production structure of a region (p.1177)”. Firstly, Asheim and Coenen (2005, p.1175) explain the underlying idea of RIS is, for considering innovation-based learning economy, understood as an interactive learning process. They (p.1174) also explain territorial agglomeration gives the best context because knowledge is sticky and grounded in social interaction (with interactive learning processes) at localized level. Secondly, concerning the relationship with clusters, Asheim and Coenen (2005, p.1174) explain clusters is sector specific and RIS is more generic sector orientation in a policy context, and since both concepts are closely related, clusters and RIS can and often do co-exist in the same territory. Lastly, Cooke and Leydesdorff (2006, p.5) explain paradigm of RIS sees regions with a systems perspective, which is generated by the recombination of the economic dynamics of the market, the dynamics of knowledge-based innovation, and governance (p.8). They also see the trajectory of a region can be the subject of evolution (p.5).

Regarding the relationship between Triple-Helix and RIS, Kerry and Danson (2016) indicate that RIS often involve organizations from differing backgrounds working together to enhance innovation efforts and the prominent theory that depicts the interaction is the Triple-Helix model (p.69). They also indicate (p.68) that both Triple-Helix stream and RIS stream are rooted in open innovation thinking which is “the use of purposive inflows and outflows of knowledge to accelerate internal innovation and expand the markets for external use of innovation (Chesbrough, 2006, p.1)”.

Evolution of helix model

As an evolution of Triple-Helix model, Yawson (2009) proposes the concept of Quadruple-Helix which includes public as fourth helix. The report by EUROPEAN UNION (2016) indicates, given the role of innovation for economic growth and competitiveness, both Triple-Helix and Quadruple-Helix approach come from the idea that “innovation is the outcome of an interactive process involving different spheres of actors, each contributing according to its ‘institutional’ function in society (p.5)” and public which is equivalent to “Citizens or users” in Arnkil et al. (2010) and “media-based and culture-based public” and “civil society” in Carayannis and Campbell (2012). Here, the report explains “civil society not only uses and applies knowledge, and demand for innovation in the form of goods and service, but also becomes an active part of the innovation system in terms of knowledge, inventiveness and creativity (p.7, 18)”. Arnkil et al. (2010) indicate while Triple-Helix is a systematic way of pursuing research/technology-driven innovations, Quadruple-Helix is a systematic way of pursuing demand or user-oriented innova-

Figure 1. Approaches and Policies for CRA



Source: Drawn up by author.

tion which is congruent with and extend the element of the RIS (p.17). Therefore, Quadruple-Helix perspective enable territories to follow non-traditional innovation paths such as non-technological improvements, service creation and creativity exploitation (EUROPEAN UNION, 2016, p.14, 18) and secure better conditions to commercialize R&D efforts (European Commission, 2012, p.37).

(4) Approaches and policies for CRA

Based on the arguments in section 1 and 2, approaches and policies for CRA can be described as follows (Figure 1). Firstly, even though the definition of regional competitiveness is complex and not unanimously agreed, the goals for regional competitiveness seems to correspond to CRA. Then, in order to achieve the goal, policies based on the approaches for CRA are required to activate the drivers for regional competitiveness.

3. Promoting regional competitive industries: actors, their role, and policy elements

In order to promote regional competitive industries, the arguments above suggests each region is required to seek its own solution with consideration of initial conditions and interfacing of various directions. Here it is expected that public sector to play a dynamic role and firms to behave more innovative ways. Based on this approach, a more system oriented and platform as well as a more proactive innovation based regional policy, with the 3 key dimensions above, should be deployed by building RIS based on Triple (Quadruple)-Helix model.

In this section, firstly, actors and their role for building RIS are clarified. Then, policy elements for building RIS, which is the core for deploying platform policy, are examined.

(1) Actors and their role for building RIS

Firstly, concerning the components to build RIS, the report by EUROPEAN COMMISSION (2006, p.79) explains that RIS is the institutional infrastructure which supports innovation and two subsystems of actors are systematically engaged in interactive learning. These subsystems are: (1) The regional supportive infrastructure or knowledge generation subsystem. This is composed of public and private research laboratories, universities and colleges, technology transfer agencies, vocational training organizations, etc. (2) The regional production structure or knowledge exploitation subsystem. This is mainly composed of firms, often displaying clustering tendencies.

Secondly, Kerry and Danson (2016, p.69) stress the importance of public policies by the government which aims to ensure the full deployment of RIS development factors proposed by Fiore et al. (2011). These factors are, as is introduced by Fiore et al. (p.1401), the crucial factors for the emergence and sustenance of competitive RIS:

- The presence of high-tech industries, potentially oriented towards international markets
- Relationships between firms and university system
- A specialized labor market and labor force, with readily available, highly skilled human capital
- Local traditions of cooperation and entrepreneurial approaches
- Supporting agencies and organizations (Asheim & Isaksen, 2002)
- The presence of social capital: shared norms, values and trust, which facilitate relationships and mutual understanding and learning (Lorenzen, 1998; Landry et al., 2002)
- Financial capacity

On the other hand, regarding the role of private-sector entrepreneurship, Feldman et al. (2005) explore how innovative clusters, which create economic competitiveness, wealth and jobs (p.130), emerge, take hold and transform regional economies. They see private-sector entrepreneurial growth as “a product of cumulative capacity building brought by exogenous shocks and involved human agency, adaptation and evolution (p.138)” and propose 3 phase model of evolution of entrepreneurial cluster (p.132):

- (1) Emergence, occurring when entrepreneurial innovation is ignited by a confluence of exogenous events.
- (2) Self-organization of the cluster and the deepening of self-reinforcing feed-backs among entrepreneurs, enterprises, institutions and resources.
- (3) Maturation of the industry into the well-functioning and rich innovative and entrepreneurial system.

Feldman et al. explain, in the genesis process of industrial clusters, which is path dependent and idiosyncratic, entrepreneurs play as economic-change agents (p.130) who shape local environments and build institutions through adaptive, self-organizing behavior as well as shaped by the environment.

Based on the arguments, it is inferred that in the process to build RIS for promoting regional competitive industries, initiated by entrepreneurs, business environment is created through involving other actors which include the two subsystems above and feed-backed by the environment for further development. These cycles occur as self-organizing process. On the other hand,

public policies by the government are implemented in order to create conditions for facilitating the cycles. These should be implemented as a more system oriented and platform as well as a more proactive innovation based regional policy. Therefore the process seems to be promoted through interaction between top-down public and bottom-up creative forces where the former provide a policy to facilitate the latter's self-organizing process. This view is supported by Asheim and Coenen (2005, p.1179 ~ 81), in which they propose "regionally networked innovation system", characterized by planned involvement of public-private cooperation by policy intervention, is most ideal among 3 types of RIS². The system allows firms and organizations deploy localized interactive learning while being supported by region's institutional infrastructure. The infrastructure is composed of regional based R&D institutes, vocational training organizations and other local organizations which are involved in firms' innovation process. They also explains the cluster is market driven, and firms gain access to wider pools of both analytical and synthetic knowledge and avoid technological and cognitive 'lock-ins' with dynamic ensemble of firms which may have informal knowledge and knowledge infrastructure which provides systematic research and development.

(2) Policy elements for building RIS

Concerning policy elements, which are essential for creating regional competitive industries through the interaction between top-down public and bottom-up creative forces as above, the following are proposed for building RIS.

Firstly, as is discussed in approaches for CRA, it is necessary to understand initial conditions of a region for considering policy options. On this point, Asheim and Coenen (2005, p.1187) indicate regional innovation policy should not be formulated based on the best practice of successful regions or expert manual, therefore, the regionalization of innovation policy is necessary. They propose "more accurate consideration can be paid to the region's specific context and circumstances in terms of the industrial structure, institutional set-up and knowledge base (p.1187)".

Secondly, the report by EUROPEAN COMMISSION (2006, p.56) proposes to increase the territorial competence bases of the region in terms of human resources and knowledge infrastructure such as universities and public R&D institutions. It also stresses to strengthen the "absorptive capacity" for acquiring external knowledge and for diffusing knowledge, as is indicated by Giuliani and Bell (2005), which are dependent on the level of knowledge of the firms. Related to this argument, based on the findings by Todtling and Trippel (2005), Asheim and Coenen (2005, p.1179) propose necessity to combine both local and non-local skills and competence in order to overcome the limits of the region.

Thirdly, the report by EUROPEAN COMMISSION (2006, p.56 ~ 58) indicates the importance of developing, attracting, and retaining talented and creative people. This is to strengthen intangible assets, which are more important than physical resources today, and to promote innovation, technological development. Therefore, the institutional supports are necessary to be open to creativity of all sorts to attract different knowledge bases and to address the issue of people's climate. On this point, Florida (2004, p.7) also stresses that, in order to attract creative people and to accelerate economic growth, not only business climate but also people's climate play important role to attract creative class who initiates to create new ideas, technology and contents.

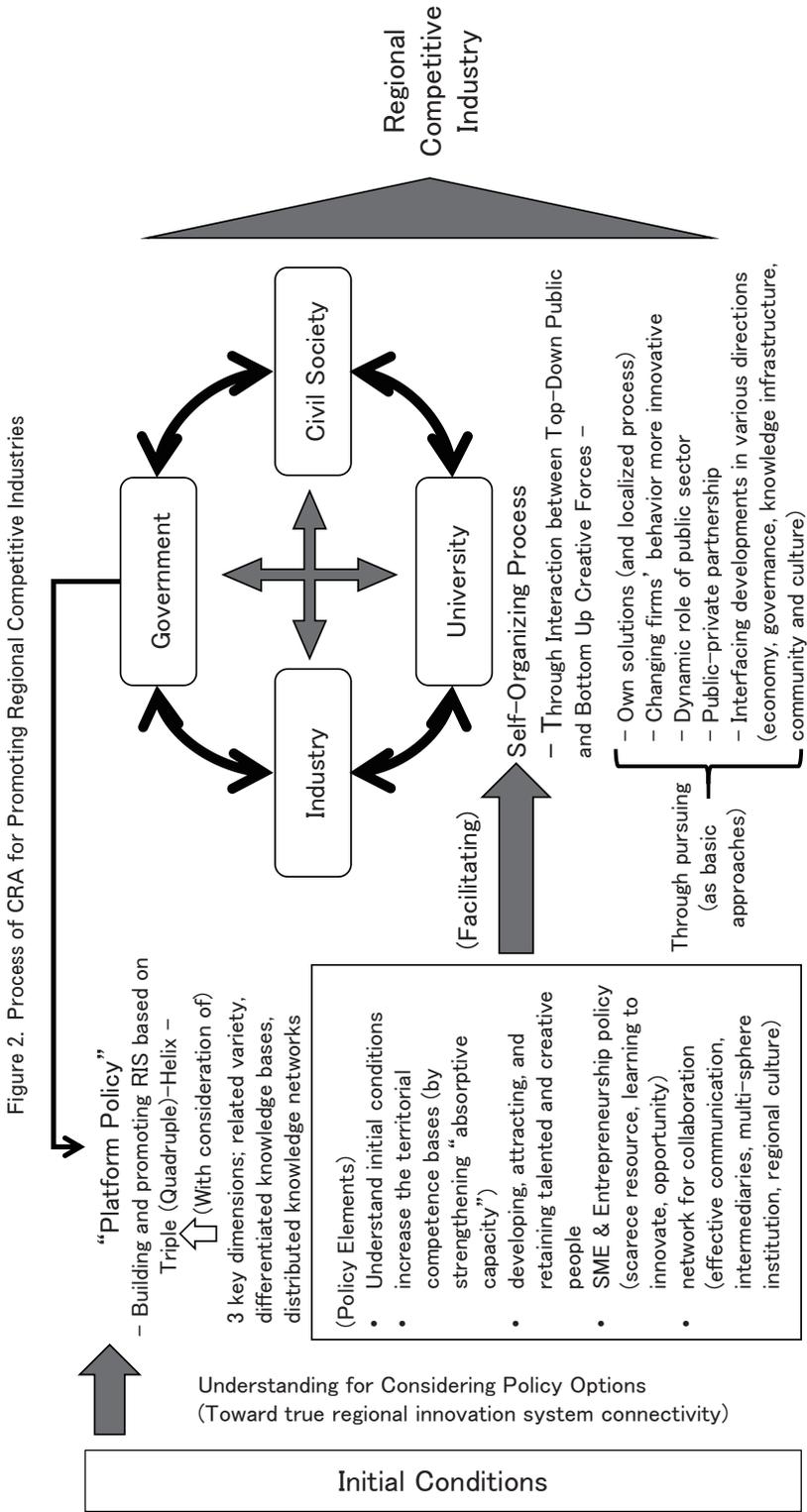
Fourthly, concerning policy for SMEs, the report by EUROPEAN COMMISSION (2006, p.59 ~ 62) stresses that it is required not only to provide scarce resources but also the policy to promote learning to innovate framework, especially for SMEs, under the trend where externalization of knowledge exploration is increasing. Moreover, in order to support entrepreneurship activity, Feldman et al. (2005) explain the importance of providing opportunity. Here, they point out the policy question is “how to translate latent entrepreneurship (individuals who desire to become entrepreneurs but who do not act) into active entrepreneurship (p.132)” and propose to show technological and market opportunities and incentives in order to induce and entrepreneurial response from individuals.

Lastly, regarding promotion of collaboration which is essential for RIS, the report by EUROPEAN COMMISSION (2006, p.42) indicates the importance of building social capital for increased cooperation and interaction. Related to this argument, Cooke and Leydesdorff (2006) indicate networking³ had become systematic in the regional perspective (p.11) and stresses effective communications between parties (p.12). In order to promote the interaction, with reference to Triple-Helix methodology, Kerry and Danson (2016) indicate the importance of role of intermediaries which “act as sponsors, brokers and boundary-spanners⁴ in the expansion of the domain of activities in the three helixes and by blurring boundaries following interactions between their actors (p.70)”, therefore, facilitate to form network for collaboration. In addition, as the institutions which facilitate collaboration between the three helixes, Ranga and Etzkowitz (2013) explain the role of “multi-sphere (hybrid) institutions⁵” which “operate at the intersection of the University, Industry and Government institutional spheres and synthesize in their institutional design elements of each sphere (p.244)”, in a balanced Triple Helix regime. Regarding cultural factors, Asheim and Coenen (2005, p.1177, 1178) stress to generate informal institutional context, such as norms, trust, and routines, therefore “regional culture”, for accelerating interactive learning among organizations.

4. Discussion and Conclusion

In this study, in order to examine how regional competitive industries are promoted through cross-sectoral inter-organizational collaboration, firstly, “why regions?” is considered and literature about the goals and the drivers for regional competitive industries are reviewed. Then, based on the concept of “Constructed Advantage”, approaches and key dimensions of “Constructing Regional Advantage (CRA)” are discussed, then, considered “Platform Policy” which aims to build “Regional Innovation System (RIS)” based on “Triple-Helix (or Quadruple-Helix) model” by promoting cross-sectoral inter-organizational collaboration. Lastly, actors and their role are clarified, then, policy elements are examined to consider more concretely about platform policy for promoting regional competitive industry.

From the review of literature above, the process of CRA which is the research theme, “how regional competitive industries are promoted through cross-sectoral inter-organizational collaboration”, can be described as follows (Figure 2). Firstly, initial conditions should be understood by policy makers as well as persons concerned who consider policy options in order to lead true regional innovation system connectivity. Then, “Platform Policy” which is to build RIS based on



4 Source: Drawn up by author.

triple (quadruple)-helix with consideration of three key dimensions (related variety, differentiated knowledge bases, distributed knowledge networks), is deployed. The policy is to facilitate the self-organizing process for cross-sectoral collaboration between industry-government-university-civil society through interaction between top-down public and bottom up creative forces. In addition, the policy implementation should be based on the “Approaches” presented in section 2.

The literature about CRA, RIS, and Triple (Quadruple)-Helix seems to help us consider overall framework for promoting regional competitive industries. It can also be inferred that, as indicated above, the key question is how the collaboration is organized externally and how knowledge creation and innovation oriented work is organized internally among different parties. This has to be promoted through a more platform and system-oriented as well as a more proactive innovation based regional policy where public sector plays a dynamic role. However, Kerry and Danson (2016, p.75), with reference to Parto (2004), indicate the concept of RIS need to be further developed. Moreover, Razak and White (2015) introduce criticisms of Triple-Helix model on its theoretical validity because “no studies have holistically examined the overall barriers and enablers when implementing and attempting to operationalise the Triple Helix model (p.279)”. The report by European Commission (2006) indicates the perspective “does not give much guidance concerning how a Triple Helix-based collaboration could be functional, operational and implemented in concrete policy settings (p.88)”. Therefore, in order to elaborate the arguments and to construct theory, key questions should be discussed and deepened further by exploring related studies such as network organization and its governance, self-organization, field, intervention, and change management, which seem to help us to find clues for elaborating theoretical framework.

REFERENCES

- Arnkil R., Järvensivu A., Koski P. and Piirainen T., (2010), “Exploring Quadruple Helix Outlining user-oriented innovation models”, Final Report on Quadruple Helix Research for the CLIQ project, under the Interreg IVC Programme
- Asheim B. T., Boschma R. and Cooke P., (2011), “Constructing regional advantage: platform policies based on related variety and differentiated knowledge bases”, *Regional Studies*, Vol. 45, Issue 7, pp.893-904
- Asheim, B.T., Coenen, L., (2005), “Knowledge bases and Regional Innovation Systems: Comparing Nordic Clusters”, *Research Policy*, Vol. 34, Issue 8, pp.1173-1190
- Asheim, B.T. And Isaksen, A., (2002), “Regional innovation systems: The integration of local “sticky” and global “ubiquitous” knowledge”, *Journal of Technology Transfer*, Vol.27, Issue 1, pp.77-86
- Borseková, K., Petříková K., and Vaňová K., (2012), “The Methodology of use and Building Competitive Advantage on the Regional Level”, *Journal of Security and Sustainability Issues*, Vol.2, No.1, pp.41-50
- Brioschi, M.S., Cassio, L. and Colombelli A., (2005), “Common frameworks for Regional Competitiveness: insight from a number of local knowledge economics”, paper presented at ERSA 2005, Amsterdam, pp.23-27, August.
- Camagni R., (2002), “On the concept of territorial competitiveness: sound or misleading?”, *Urban Studies*, Vol.39, pp.2395-2411
- Carayannis E.G. and Campbell D.F.J., (2012), “Mode 3 Knowledge Production in Quadruple Helix Innova-

- tion Systems - Twenty-first-Century Democracy, Innovation, and Entrepreneurship for Development”, SpringerBriefs in Business 7
- Cellini R. and Soci A., (2002), “Pop competitiveness”, BNL Quarterly Review, No. 220, pp.71-101
- Chesbrough H., (2003), “Open Innovation: The New Imperative for Creating and Profiting from Technology”, Harvard Business School Press (Boston).
- Chesbrough, H., (2006), “Open Business Models: How to Thrive in the New Innovation Landscape”, Harvard Business Press (Watertown, MA)
- Cooke, P. and Leydesdorff, L., (2006), “Regional Development in the Knowledge-Based Economy: The Construction of Advantage”, The Journal of Technology Transfer, Vol.31, Issue 1, pp.5-15.
- Etzkowitz, H., & Leydesdorff, L., (1997), “Universities and the Global Knowledge Economy: A Triple Helix of University-Industry-Government Relations”, Pinter (London)
- EUROPEAN COMMISSION (1995), “Green Paper on Innovation”, December 1995, EC (Brussels)
- EUROPEAN COMMISSION (1999), “Sixth Periodic Report on the Social and Economic Situation and Development of Regions of the European Union”, EC (Brussels)
- EUROPEAN COMMISSION (2006), Constructing regional advantage. Principles, perspectives, policies, final report, DG Research (Brussels)
- EUROPEAN COMMISSION (2012), “Guide to Research and Innovation Strategies for Smart Specialisation (RIS 3)”, May 2012, EC (Brussels)
- EUROPEAN UNION (2016), “Using the quadruple helix approach to accelerate the transfer of research and innovation results to regional growth”, EUROPEAN UNION, Committee of the Regions (Brussels)
- Feldman M. P., Francis J and Bercovitz, J., (2005), “Creating a cluster while building a firm: entrepreneurs and the formation of industrial clusters”, Regional Studies, Vol.39, pp.129-141
- Fiore, A., Grisorio, M.J., and Prota, F., (2011), “Regional innovation systems: which role for public policies and innovation agencies? Some insights from the experience of an Italian region”, European Planning Studies, Vol.19, No.8, pp.1399–1422
- Florida, R., (2002), “The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life”, Basic Books (New York)
- Giuliani, E., (2005), “The structure of cluster knowledge networks: uneven and selective, not pervasive and collective”, Paper presented at the DRUID tenth anniversary summer conference on ‘Dynamics of Industry and Innovation: Organizations, Networks and Systems’, Copenhagen, June 2005.
- Giuliani, E. and Bell, M., (2005), “The Micro-determinants of Meso-level Learning and Innovation: Evidence from a Chilean Wine Cluster”, Research Policy, Vol.34, Issue 1, pp.47-68.
- Ivanova, I., (2014), “Quadruple helix systems and symmetry: a step towards helix innovation system classification”, Journal of the Knowledge Economy, Vol.5, No.2, pp.357-369
- Kerry, C. and Danson, M., (2016), “Open innovation , Triple Helix and regional innovation systems – Exploring CATAPULT Centres in the UK –”, Industry & Higher Education, Vol.30, No.1, February 2016, pp.67-78
- Kitson, M., Martin, R. and Tyler, P., (2004), “Regional Competitiveness: An elusive yet key concept?”, Regional Studies, Vol. 38, Issue 9, pp.991-999
- Landry, R., Amara, N., and Lamari, M., (2002), “Does social capital determine innovation? To what extent?”, Technological Forecasting and Social Change, Vol.69, No.7, pp.681-701
- Lorenzen, M., eds., 1998), “Specialization and Localized Learning, Copenhagen Business School Press (Copenhagen)
- Maskell, P., (1998), “Successful low-tech industries in high-cost environments: The case of the Danish furniture industry”, European Urban and Regional Studies, Vol.5, Issue 2, pp.99-118

- Pessoa, A., (2008), "Tourism and Regional Competitiveness: the Case of the Portuguese Douro Valley," FEP Working Papers 299, Universidade do Porto, Faculdade de Economia do Porto
- Pessoa A., (2013), "Competitiveness, Clusters and Policy at the Regional Level: Rhetoric vs. Practice in Designing Policy for Depressed Regions", *Regional Science Inquiry Journal*, Vol.V, No.1, pp.101-116
- Pinch, S., Henry, N., Jenkins, M., & Tallman, S., (2003), "From "industrial districts" to "knowledge clusters": a model of knowledge dissemination and competition in industrial agglomerations", *Journal of Economic Geography*, Vol.3, pp.73-88
- Porter, M., (1990), "The Competitive Advantage of Nations", Macmillan (Basingstoke)
- Porter, M., (1998), "Clusters and the new economics of competitiveness", *Harvard Business Review*, December, Vol.76, No.6, pp.77-90
- Porter, M., (2003), "The economic performance of regions, *Regional Studies*", Vol.37, No.6&7, pp.549-578
- Ranga, M., and Etzkowitz, H., (2013), "Triple Helix systems: an analytical framework for innovation policy and practice in the knowledge society", *Industry and Higher Education*, Vol.27, No.4, pp.237-262
- Razak, A. A. and White, G., (2015), "The Triple Helix model for innovation: A holistic exploration of barriers and enablers", *International Journal of Business Performance and Supply Chain Modelling*, Vol.7, No.3. pp.278-291
- Tödting, F., Trippel, M. & Brathl, H., (2005), "Networking and Project Organisation in the Automotive Industry: the Case of Styria", in Legendijk, A., Oinas, P., eds. "Proximity, Distance and Diversity: Issues on Economic Interaction and Local Development", Ashgate (Aldershot)
- Viassone M., (2008), "Regional Competitive Index as a tool to improve regional foresight: theory and evidence from two Western-Europe Regions", 8th Global Conference on Business & Economics, pp.1-29
- Yawson R. M., (2009), "The Ecological System of Innovation: A New Architectural Framework for a Functional Evidence-Based Platform for Science and Innovation Policy", *The Future of Innovation Proceedings of the XXIV ISPIM 2009 Conference*, Vienna, Austria, June 21-24, 2009

Notes

- 1 The typology of the regions are: 1) peripheral regions, 2) old industrial regions, 3) fragmented metropolitan regions, 4) regions with cutting technological edge. The report indicates each category faces different problems and challenges and propose "specific and individual approaches to innovation policies in order to correct problems and promote economic and social development (p.37)".
- 2 The other types of RIS are "territorially embedded regional innovation system" which emphasizes localized, path dependent inter-firm learning processes, and "regionalized national innovation system" in which scientific research take a much more prominent position (Asheim and Coenen, 2005, p.1180).
- 3 Networking partners include universities, research laboratories, research associations, industry associations, training agencies, technology transfer organizations (TTOs), specialist consultancies, government development, technology and innovation advisory agency programme-funding, and private investors (Cooke and Leydesdorff, 2006, p.8).
- 4 Kerry and Danson (2016, p.70-71) explains, depending both on nature of organization and resources and the environment, the intermediaries plays the role of coordinator, gatekeeper or representative, and in some cases provide the financial capacity.
- 5 Ranga and Etzkowitz (2013) list the following multi-sphere (hybrid) institutions: technology transfer offices in universities, firms and government research labs, industrial liaison offices, business support institutions (science parks, business and technology incubators), financial support institutions (public and private venture capital firms, angel networks, seed capital funds, etc.).