IMITATION TO INNOVATION: CHANGING GOVERNMENT ROLE IN REGIONAL CLUSTER DEVELOPMENT IN KOREA

By

LEE, Eunchong

THESIS

Submitted to
KDI School of Public Policy and Management
in partial fulfillment of the requirements
for the degree of

MASTER OF DEVELOPMENT POLICY

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Committee in charge:

Professor Hun Joo PARK, Supervisor

Professor Tae Jong KIM

Professor Ju Ho LEE

Approval as of April, 2015

ABSTRACT

The Korean government started the construction of Daedeok Science Town in 1973 after recognizing that the Korean industrial structure based on a few conglomerates revealed certain vulnerabilities with the slowdown of the world economy and the rise of international currency and trade pressures. With the increasing importance of regional clusters of sustainable development over the last few decades, the Dadeok Science Town was re-designed as Daedeok Innopolis (DI) in 2006 in pursuance of the Special Act on Fostering Daedeok Innopolis enacted in July, 2005 (www.innopolis.co.kr).

The purpose of this qualitative research is to explore and understand the role of governments in regional cluster formation through a case study of the Korean government's role in the development history and current status of DI. By constructively analyzing a series of literature and quantitative studies on regional clusters and on DI, this paper finds that while the Korean government successfully achieved many of the pre-requisites for establishing a vibrant regional cluster including human capital, infrastructure, technology, and competitive research institutes, it efforts had limitations in promoting other critical components of regional clusters such as intensive inter-firm interaction, shared know-how, spill-over expertise, and strong firm-support systems. This is because these "software" elements grow "organically" over time in a social-capital abundant environment. Lee refers this to an "innovative habitat," which not only includes "people, firms and institutions – their networks and modes of interaction" but also their complex, dynamic and interdependent relationships which the state has little control over (Lee et al. 2000, 4).

While the government has limitations in directly facilitating networks among entities and individuals it can support the next stage of DI's innovative system by strengthening mechanisms to promote social capital and social trust. Although there is still very little research conducted on "what works" in the promotion of social capital, in general, the realm of civil society is regarded as the most fundamental in the building of the attitudinal aspects of social capital, such as trust and

cooperation (Stolle 2003, 20).

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INTRODUCTION

In the age of globalization, where technology rapidly changes, competition is fierce and conventional economic development approaches show limitations, governments are continually searching for new policies and instruments to improve economic performance and remain competitive (Singh 2003, 1; "Competitive Regional Clusters: National Policy Approaches" 2007). In this context, governments have been more proactive and strategic in supporting cluster-based economic development (Singh 2003; "Competitive Regional Clusters: National Policy Approaches" 2007). While common practices exist in cluster development, governments use different instruments and implement different policies depending on the specific context of their country ("Competitive Regional Clusters: National Policy Approaches" 2007).

The objective of this paper is to examine the Korean government's role and its limitations in cluster development by conducting a case study on Korea's most successful regional cluster, Daedeok Innopolis (DI). Specifically, this paper wishes to highlight the evolutions of government's role in the different life cycle stages of Daedeok Innoplis (DI) and suggest the next government's role in effectively creating an innovative habitat for the next stage of DI's development. While the focus of this paper is on government policies and role, the importance of other organizations such as private firms, institutions, and non-profit organizations on cluster development is recognized and emphasized in the paper by underscoring the importance of networks among these different actors.

The paper is organized as follows: section 1 reviews the existing literature on regional clusters, the definitions, and the development from theory to practice; section 2 conducts a case study of DI looking from its historical development to its current limitations; section three 3 explores the possible explanation of DI's lack of competitiveness and brings social capital into the discussion; and section 4

assesses the implications of the findings and argues for a shift in the focus of the government's role in regional cluster development.

LITERATURE REVIEW

Theoretical Origins and Developments

Economists have long observed that specific locations specialize in particular industries and firms engaged in the same or related fields tend to cluster together (Piperopoulos 2012). The concept of national and regional specialization was introduced in the early 19th through Ricardo's work on comparative advantage. Ricardo's theory of comparative advantages assumes that one place is able to produce in a given industry more competitive than another based on the differences in endowments such as geographical location and thereby to specialize in that activity (Ricardo 1817). A century later, Alfred Marshall's *Principles of Economics* (1890) elaborated reasons for greater firm productivity when several firms in the same industry are located in close geographical proximity to one another, "notably labor market pooling, knowledge spillovers and supplier specialization" (cited in Piperopoulos 2012). Subsequent studies have confirmed that the close proximity of the firms reduces transaction costs, makes it easier for people to connect with one another outside their own firm to trade products, ideas and even people (Halpern 2005, 55). Additionally, investments tend to concentrate in these concentrated regions which offer better access to infrastructure and human capital, lower risks and better access to markets (Krugman and Venables, 1990).

With globalization and the increase in efficiency and effectiveness of transportation and communication means, some may think that the significance of regions and locations have been reduced

or eliminated (Smedlund and Toivonen 2007). In contrast, though, "networking, developing strong regional clusters, capitalizing on spatial proximity and tacit knowledge and achieving synergies through competition alongside co-operation in geographical proximity, has never been more crucial for the economic development and competitiveness of regions and SMEs" (Piperopoulos 2012; Smedlund and Toivonen 2007). Michael Porter's work on regional clusters, *Clusters and the New Economics of Competition* (1998), states that as the world economy becomes more complex, knowledge based, and dynamic, the more important geographical, cultural, and institutional proximity becomes as "enduring competitive advantages in a global economy lie increasingly in local things – knowledge, relationships, and motivation – that distant rivals cannot match" (Porter 1998, 90).

Table 1. Theoretical benefits of clusters

Concept	Benefit
Marshallian externalities	
Labour market pooling	Labour cost savings due to access to specialised skills, especially inanenvironment where quick turnaround is important
Greater variety of specialised intermediate goods and service	Access to a local supplier base that has more product variety and a high degree of specialization
(Tacit) knowledge spillovers	Access to tacit knowledge in geographic proximity by means of both formal processes as well as through such informal channels as knowledge leakages made possible by casual inter-firm interactions
Porter's market conditions	
Demanding customers	Motivational effects due to demands of highly competitive local customers thatimprove quality, cost, etc.
Rivalry	Motivational effects related to social/peer pressure
Complementarities	Better sales opportunities of firms due to search cost savings for the buyers of complementary products offered in proximity and privileged opportunities for co-operation (sales, marketing, etc.) between nearby suppliers ofcomplementary products
Cost advantages	
Transportation	Transportation cost savings due to geographic proximity, especially in the case of just in time delivery contracts
Trust	Transaction cost savings due to an environment that encourages trust

Source: "Competitive Regional Clusters: National Policy Approaches." OECD 2007, 33.

Definition

The Organization for Economic Co-operation and Development (OECD) defines a "cluster" as "networks of strongly interdependent firms, knowledge production organizations (universities, research institutes, knowledge-intensive business services), bridging institutions (brokers, consultants) and

customers, linked to each other in a value-adding production chain" ("Competitive Regional Clusters: National Policy Approaches" 2007). Michael Porter defines clusters as "geographic concentrations of interconnected companies, specialized suppliers and service providers, firms in related industries, and associated institutions (e.g. Universities, standard agencies, and trade associations) in particular fields that compete, but also cooperate" (1980).

These definitions, however, extend beyond the notion of geographical proximity and incorporates other concepts such as networking and co-operating in regional clusters. In need of a more narrow and precise definition, the European Commission's study on "*Regional Clusters in Europe*" (2002) distinguishes regional clusters in a hierarchy of three concepts. The first, *regional cluster*, refers to the "geographical concentrations of interconnected firms; the second, *regional innovation network*, denotes "more organized co-operation (agreement) between firms, stimulated by trust, norms, and conventions, which encourages firms' innovation activity; and the third, *regional innovation system*, describes a system involving co-operation also between firms and different entities such as universities, R&D institutes, and finance institutions for knowledge development and diffusion ("Regional Clusters in Europe" 2002, 14). These distinctions are valuable for policy makers in assessing and the innovative capacity and evaluating the development and significance of a regional cluster.

Table 2. A hierarchy of three concepts

Concepts	Definitions and differences
Regional Cluster	A concentration of 'interdependent' firms within the same or adjacent industrial sectors in a small geographical area
Regional Innovation Network	More organised co-operation (agreement) between firms, stimulated by trust, norms and conventions, which encourages firms' innovation activity
Regional Innovation System	Co-operation also between firms and different organisations for knowledge development and diffusion

Source: "Regional Cluster in Europe." European Commission, 2002.

From Theory to Policy

While there is strong evidence that clusters are good for cultivating entrepreneurship and innovation, it is less clear whether or not states have the ability to generate those clusters by policies or programs. While some of the most successful regional clusters such as the Silicon Valley certainly benefited from government research funds, they did not emerge out of any national vision or plan

(Chatterji et al. 2013, 22). In such cases, clustering usually occurred because companies wanted to build on the back of an existing network of expertise, such as a university with particular strength in the field (Halpern 2005, 55).

Porter argues that while clusters usually emerge spontaneously based on market forces, since clusters involve powerful externalities, there is a strong rationale for public policy (Porter 2007, 5). In theory, various public policies and initiatives can impact the founding and growth of startups in specific geographic regions (Porter 2007, 5). Public policy can increase private sector investment efficiency and foster new business formation by assembling information about cluster composition, membership, employment and performance (Porter 2007, 5). The government can also convene cluster participants and actively converse with them to assess and support their needs (Porter 2007, 5). Cluster policies can also establish university research centers, training facilities, and other assets that may collectively benefit firms inside the clusters (Porter 2007, 5). However, in reality, the role of public policy in creating and sustaining regional clusters, as hubs of innovation and entrepreneurship is complex (Chatterji et al. 2013, 22).

The challenge for policy makers in regional clustering is to design programs or policies that can help achieve specific objectives ("Competitive Regional Clusters: National Policy Approaches" 2007, 37). The single or multiple objectives of state programs and policies or the instruments they use to achieve them may also change over time ("Competitive Regional Clusters: National Policy Approaches" 2007, 62). In recent years, many countries are promoting policies and programs seeking to strengthen or replicate the success factors that have encouraged the concentration of innovative firms ("Competitive Regional Clusters: National Policy Approaches" 2007, 2). The new approach to regional cluster policy in mature economies focuses on “making domestic firms more competitive, emphasizing innovation and better use of knowledge and technology in the region” ("Competitive Regional Clusters: National Policy

Approaches" 2007, 41).

Gap in literature

While there is extensive literature examining and evaluating regional clusters, there are few studies on the evolutionary path regional clusters have taken and their relationship with governments, especially ones in Asia. This paper attempts to contribute to the relatively little literature on the changing roles of government policy and programs at different stages of regional cluster development in Korea by conducting a case study of DI. While there have been few studies examining the role of the Korean government in the establishment of DI (Kim et al. 2014), this paper will be the first to include the role of social capital in the discussion.

CASE STUDY: DAEDEOK INNOPOLIS

From Daedeok Science Town to Daedeok Innopolis

In the 1970s, the Korean government gave specific attention to the role of SMEs and regional innovation systems for economic development and regional competitiveness (Park S. 2002, 2). Specifically, the government realized the need for “regional decentralization and the upgrading of the industrial structure pursuing technological transition from an imported technology to developing nation's own technology” (Park S. 2002, 2). Based on this rationale, the government of Korea, under president Park Chung Hee’s leadership in the 1970s established Daedeok Science Town with the purpose of enhancing “the national competitiveness of high technology and economic prosperity through the

agglomeration of research institutes" (Oh and Yeom 2012, 144).

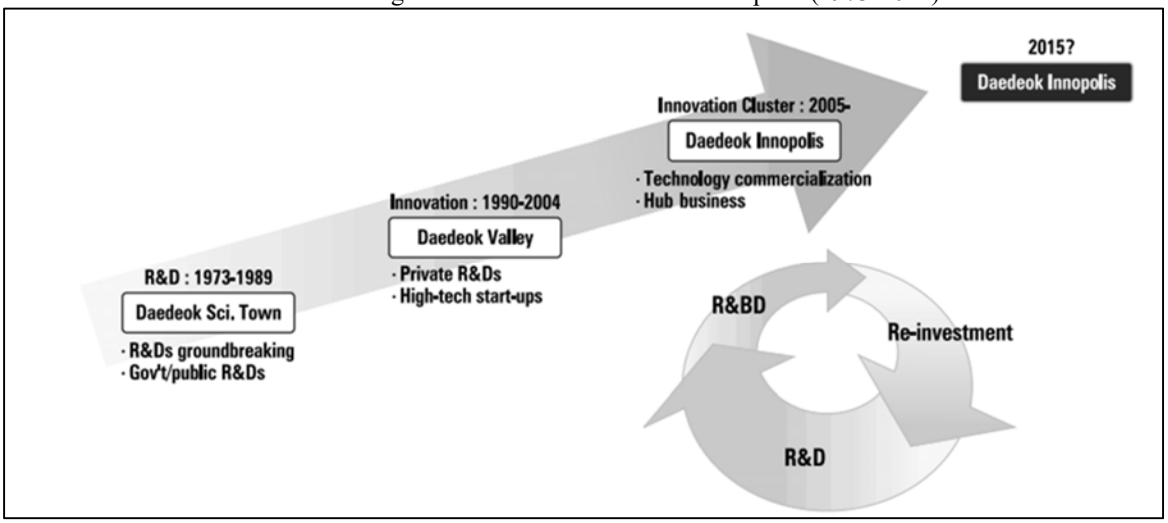
According to policy makers, there were three distinct processes in the development of DI (see Fig. 1). The initial development stage of the Daedeok Science Town in the 1970s focused on creating a R&D cluster by establishing public sector research institutes and nationally funded universities (Oh and Yeom 2012, 144). However, with the need to apply research to commercialization, since the mid 1990s, the government increased efforts in establishing high-tech venture firms in Daedeok and mechanisms to commercialize R&D results (Oh and Yeom 2012, 144). In this consideration, the government developed a high-tech industrial district known as the Daedeok Techno-Valley and re-designated the area composed on Daedeok Science Town and Daedeok Techno-Valley as the first National Special R&D Zone (Oh and Yeom 2012, 145).

In 2005, as part of the country's Plan for National Balanced Development, Korea introduced the Innovative Cluster Cities policy which aims to transfer "seven key regional industrial complexes from manufacturing centers into more innovation-oriented regional hubs" ("Competitive Regional Clusters: National Policy Approaches" 2007, 242). The Korean government established the Korea Industrial Complex Corporation (KICOX) under the Ministry of Commerce to provide various services to clusters such as "development of an integrated information network, management and operation of the complexes, services (including loans to firms for specific programs), and support for factory development" ("Competitive Regional Clusters: National Policy Approaches" 2007, 244). Under this new initiative, policy makers assessed that the Dadeok Science Town will obtain even further growth and re-designed the cluster as Daedeok Innopolis (DI) with the objective of developing it into an innovative regional cluster of national and local strategic industries (Oh and Yeom 2012, 149)

As of December 2012, there are 1,403 tenant institutes in total (30 government research institutes, 11 public research institutes, 14 national and public agencies, 29 non-profit organizations, 7 universities,

and 1,312 corporations) and 64,321 employees working in Daedeok Innopolis (www.innopolis.com). DI is widely regarded by both Korean policy makers and scholars to have contributed to Korea's industrial and technology development as a national R&D hub (Kim et al. 2014, 844).

Figure 1: Evolution of Daedeok Innopolis (1973-2012)



Source: Daedeok Innopolis Management Office (Dec. 2008) in Oh and Yeom 2012, 143.

Table 3. Comparison of two Asian clusters with Silicon Valley (as of 2008)

	Patent	Area (km^2)	Employees	Output
Silicon Valley	9,474	2966	1,322,634,	c.a. 220 billion US dollar
Daedok Innopolis	4,949	27	18,796	c.a. 10 billion US dollar
Hsinchu Science Park	3,026	7	98,685	30.6 billion US dollar

Source: Park 2011, 462

Daedeok Innopolis Competitiveness

While there is no doubt that DI made some significant progress over the past several decades with its growing economy, highly skilled workforce, and advancements in technology, whether it has become Korea's 'Silicon Valley' and has a habitat for sustaining innovation and entrepreneurship is questionable to say the least. According to a comprehensive study by Soklkovo an expert rating agency in 2012, DI was ranked 34th among 35 global regional clusters for effectiveness and was categorized as

"innovation centre of regional scale" along with only two clusters while the rest were categorized as either "innovation centre of national scale" or "innovation centre of international scale" ("Creating and Developing Innovative Clusters" 2012, 8-9). Kim and An (2012) also find that while DI has made meaningful performance, it has not contributed to improving the regional innovation system, especially in regards to active networking among R&D organizations, universities, and industries (119).

In the case of the Silicon Valley, collaboration among many entities such as firms, universities, and government research institutes (GRI) is key for innovation and a regional innovation ecosystem in which the different entities form and maintain a mutual and interdependent relationship as collaborators are in place (Yun and Lee 2013, 278). However, Yun and Lee's study (2013) which examine the strength of collaborations among DI and Hsinchu Science Park by measuring network densities in the regional clusters, find that DI could not create cooperative networks among the GRIs and universities and thus could not generate significant economic results (Yun and Lee 2013, 286).

Yun and Lee (2013) attempt to understand part relationships of the entities within Daedeok by examining the university-industry-government (UIG) collaborative relations in Daedeok through the Triple Helix model (Yun and Lee 2013, 278). The concept of the Triple Helix was initiated in the 1990s by Etzkowitz (1993) and Etzkoqitz and Leydesdorff (1995), and shifts the focus from an industry-government dominant dyad in the industrial ecosystem to a university-industry-government triadic relationship. The Triple Helix model is effective in examining knowledge-based cluster development in different countries because "it can help suggest innovation policies that emphasize interaction between demands, supplies, and other environmental factors" (Yun and Lee 2013, 278).

Their comparative study result showed that the network density level of 22 UIG entities in DI was 0.4372 while the network density level of 24 UIG entities in Hsinchu Science Park was 1.8732 which was significantly higher than Daedeok (Yun and Lee 2013, 282).

Table 4. Selection of representative UIG entities in Science Parks

Categories	Daedeok Innopolis	Hsinchu Science Park
University	KAIST, Chungnam National Univeristy	National Chiao Tung Univeristy, National sing Hua University
Industry	Silicon Works, Lihtron	TSMC, AU Optronics
GRIs	ETRI, Korean Institute of Science and Technology Information	ITRI, National Chip Implementation Centre

Source: Yun and Lee (2013)

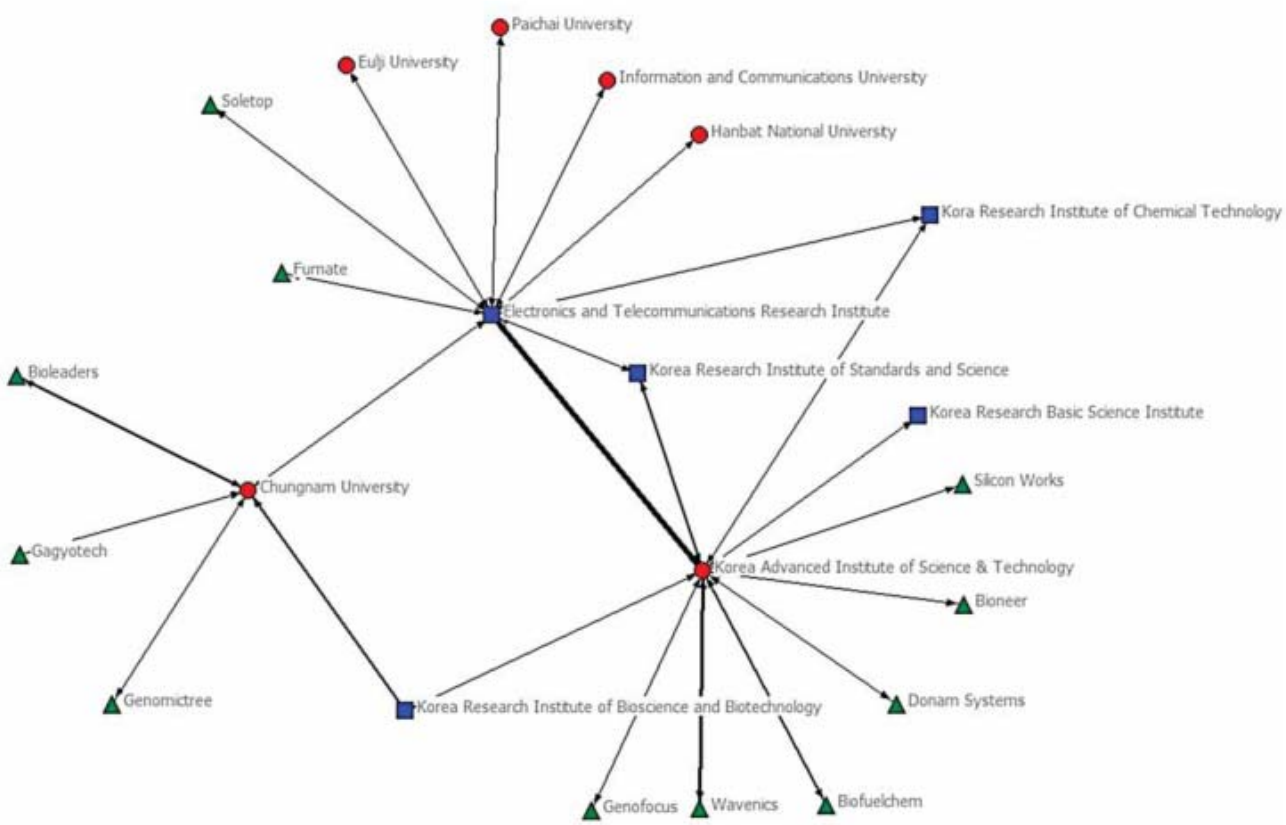
Table 5. Co-patenting network density

Region	Entities	Network Density	
		Average Value	Standard deviation
Daedeok Innopolis	Universities Companies GRIs	0.4372	2.5199
Hsinchu Science Park	Universities Companies GRIs	1.8732	9.4651

Source: Yun and Lee (2013)

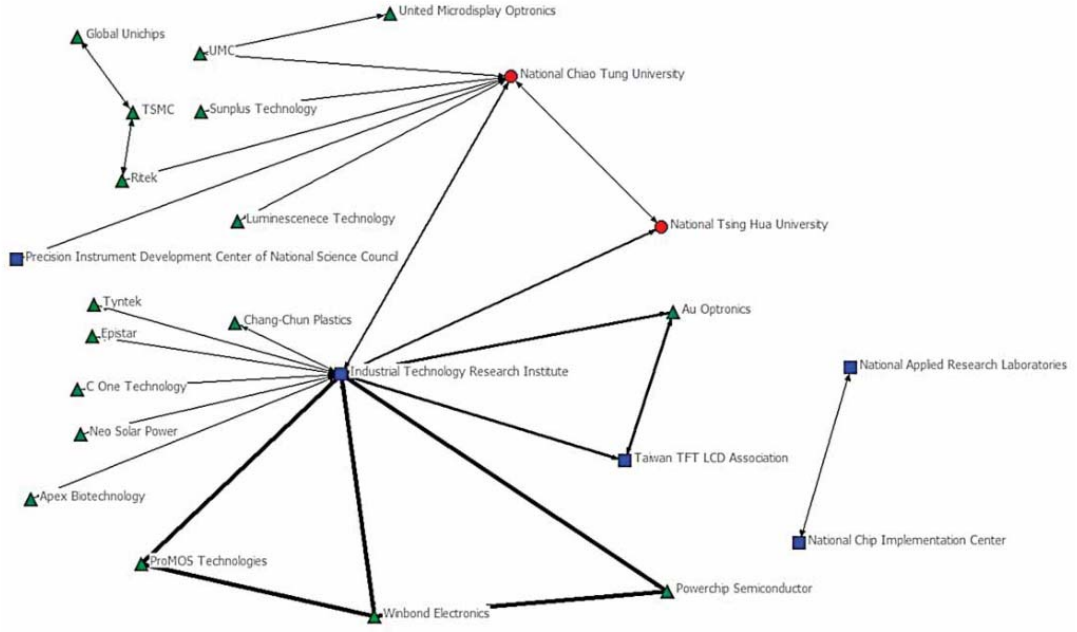
Analysis of network nodes also indicated that the comprehensiveness and connectedness between the network nodes in Daedeok are not high with the exception of ETRI and KAIST (Yun and Lee 2013, 282). The UIG entities in Daedeok formed exclusive networks with weak horizontal cooperative networks between the different groups. (Yun and Lee 2013, 282). On the contrary, the comprehensiveness and connectedness between the network nodes in Hsinchu Science Park was high and companies are well-connected (Yun and Lee 2013, 282). This finding is also supported by other scholars such as Park (2011) who also finds that DI had "weak collaboration between industry and university, limited synergy effect, low number of venture businesses, and weak amenity" (Park 2011, 463).

Figure 2: UIG network of Daedeok Innopolis



Source: Yun and Lee (2013)

Figure 3: UIG network of Hsinchu Science Park



Source: Yun and Lee (2013)

Yun and Lee's study also reveals that the knowledge creator role (or gatekeeper role) is restricted to GRIs and universities in Daedeok, while in Hsinchu Science Park, companies as well as universities and GRIs play the role of gatekeepers. The advantage of the latter structure is "in its capacity to create a cooperative ecosystem and subsequently, cooperation is actively practiced among UG entities (Yun and Lee 2013, 285). What this suggests is that research institutes in Daedeok Innoplis are competing for intellectual property rather than "embracing a culture of mutual information sharing" (Yun and Lee 2013, 28.)

However, creating an environment "that promotes learning and mutual adjustment among specialist producers of a complex of related technologies," is critical to encouraging entrepreneurship and experimentation (Saxenian 1996, 45). In the Silicon Valley, companies compete intensively while simultaneously learning from one another about changing markets and technologies through information, communication and collaborative practices (Saxenian 1996, 45). This creative mix of local cooperation and competition was coined as 'co-optition' (Halpern 2005, 55). The open business environment encourages horizontal communication among firm's divisions and with outside suppliers and customers as well (Saxenian 1996, 45).

However, other studies also show that DI is still much like the Route 128 region, which is dominated by independent corporations that internalize a wide range of productive activities (Saxenian 1996, 45). "Practices of secrecy and corporate loyalty govern relations between these firms and their customers, suppliers, and competitors, reinforcing a regional culture that encourages stability and self-reliance" (Saxenian 1996, 45). Authority within firms tends to remain centralized and information tends to flow vertically. Social and knowledge networks remain internal to the firm, and the boundaries between firms and between firms and local institutions remain for more distinct in this model of industrial cluster (Saxenian 1996, 45). While the Korean government seems to have succeeded in

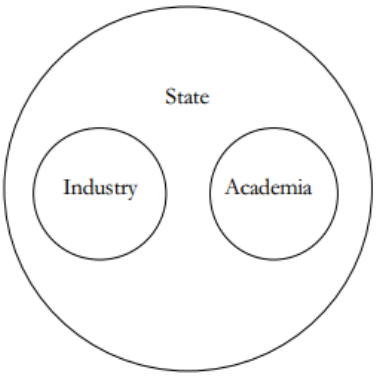
developing excellent hardware such as infrastructure, it has limitations in creating the software consisting of inter and intra firm collaborations and networks.

Limitations of government efforts

As observed, DI is an artificial creation of the Korean government, formed and developed with the direct intervention and subsidization by the Korean government (Park 2012). This government-led development is what Etzkowitz (2000) refers to as the static Triple Helix model where the "state adjusts the relationship between innovation entities, provides new initiative and project resources as well as plays the lead role for the three types of entities" (cited in Yun and Lee 2013, 285). The statist Triple Helix model can be extremely advantageous in the development stage as it can reap efficient results from intensive nurturing of technology development ("such as strong leadership, clear goal-setting, and resource mobilization by the government") (cited in Yun and Lee 2013, 285). Additionally, educational organizations and institutes can grow under government leadership and have a positive impact on regional development (Yun and Lee 2013, 285). In the case of DI, KAIST, an education institute founded in 1971 by the government, and ETRI, a GRI within DI can be given as examples of outstanding achievements of government efforts in the static Triple Helix model.

Many scholars agree that a strong government with competent technocrats is an essential factor in the early stages of industrialization of successful development (Kim 2001, 219). Yet while scholars acknowledge that Korea's highly centralized and hierarchical structure had been an asset in early rapid industrial growth, they now recognize the need for a more decentralized, flexible, and lateral bottom-up organization in order to achieve an innovative creative economy (Kim 2001, 242).

Figure 4: Statist Triple Helix model



Source: Etzkowitz (2002)

MISSING LINK: REGIONAL CLUSTERS AND SOCIAL CAPITAL

Silicon Valley and Social Capital

Unlike DI, Silicon Valley's innovative habitat, which encompasses all the resources, high-tech entrepreneurial firms need to flourish, grew "organically" over time (Lee et al. 2000, 4). And like a natural habitat, it not only includes "people, firms and institutions – their networks and modes of interaction" but also their complex, dynamic and interdependent relationships which the state has little control over (Lee et al. 2000, 4).

Silicon Valley's vast networks in the Silicon Valley are actually agglomerations of many smaller social networks and relationship (Lee et al. 2000, 6). According to Saxenian, "proximity facilitates the repeated, face-to-face interactions that foster the mix of competitions and collaboration required in today's fast-paced technology industries" (Saxenian 1996, 57). Informal conversations were pervasive and served as an important source of up-to-date information on various topics including competitors, customers, markets and technologies (Saxenian 1996). Entrepreneurs came to regard social relationships and interactions as a crucial part of their business. Saxenian claims that these open-minded approaches

to co-operation and communication between rivalry enterprises, private and public institutes, customers and suppliers laid the foundation for Silicon Valley's innovation capabilities and competitiveness (Saxenian 1996).

In addition to social relationships, the people in the valley have many overlapping kinds of associations – they may have been colleagues at an established firm, or share universities, or share an ethnic identity and belong to a group such as Monte Jae, or may share a profession as a lawyer, engineer, or designer (Lee et al. 2000, 6). These ties may be formal (e.g. a university or a firm) or informal (e.g. Homebrew Computing Club) but in whichever case, opportunity seekers can collect information from the different communities they belong to and from associational activities they are involved in, that eventually might materialize into serious business propositions (Raluca 2013, 581).

These social networks also contributed to creating Silicon Valley's open labor market. Recruitment can occur not only through close relationships, but what Granovetter (1973) calls "weak ties" – e.g. friends of friends, acquaintances, etc. Studies show that employees hired through personal networks tend to stay with the firm longer, experience faster mobility within the organization, and perform superior to those recruited by other means (Castialla et.al 2000, 220). Due to these higher economic returns, firms are willing to pay financial rewards for successful referrals (Castilla et.al 2000, 220).

Since the process of decision making becomes dependent on the information collected from suppliers, distributors, clients and even competitors, the providing sources of information need to be reliable; this way the presence of trust becomes mandatory for successful networking (Raluca 2013, 581). Social trust generally refers to the way people relate to each other. Kenneth Newton describes it as "the collective attitudes people have about their fellow citizens" while Pamela Paxton considers trust as the 'types of ties between individuals, where the presence of positive ties is essential' (quoted in Park

and Shin 2005, 68). Bernard Barber sees trust as "expectations that people have about each other" while Toshio Yamagishi and Midori Yamagishi define it as 'expectation of goodwill and benign intent" (quoted in Park and Shin 2005, 68).

Korea and Social Capital

In the case of Korea, studies and surveys consistently show that Korea fundamentally lacks these social networks and social trust to generate active collaborations and interactions among individuals. Park and Shin (2005) find through a series of surveys that Koreans, regardless of any socio-demographic categories, have minimal social involvement, as measured by formal and informal group membership. In their studies, as show in in Table 3, the absolute majority (91%) of Koreans (as compared with 33% for Japan and 71% in Taiwan) are not associated with any formal groups such as professional associations, labor unions, and civic associations. Out of the 9% that join formal groups, only 2% join two or more which is a very tiny minority when compared with Japan (40%) and Taiwan (10%) (*Refer to Table 4)* (Park and Shin 2005, 11). Among the Korean people who were members of formal organizations, a plurality (39%) belonged to alumni associations which was higher than in Japan (19%) and Taiwan (3%) (Park and Shin 2005, 11).

Table 6. Levels of social involvement in Korea, Japan and Taiwan

	Korea			**Japan**			**Taiwan**		
Number of membership	Formal group	Informal group	Either	Formal group	Informal group	Either	Formal group	Informal group	Either
0	91.2%	52.9%	49.2%	32.9%	51.0%	24.8%	70.5%	63.0%	4.1%
1	6.9	34.3	33.2	27.0	23.6	19.7	19.8	25.1	28.6
2	1.5	11.0	13.8	18.8	14.5	15.3	6.2	8.2	12.0
3 or more	0.4	1.9	3.8	21.2	11.0	40.1	3.5	3.7	12.3
(N)	*1,500*	*1,500*	*1,500*	*1,418*	*1,418*	*1,418*	*1,415*	*1,415*	*1,415*

Source: 2003 EAB survey in Korea, 2003 EAB survey in Japan and 2001 EAB survey in Taiwan

Table 7. Formal group memberships

Types of formal groups	**Percent affiliated**
Residential association	8.3%
PTA	7.6
Trade association	12.1
Agricultural Association	3.8
Labor union	4.5
Volunteer group	20.5
Citizen movement organization	2.3
Religious group	6.1
Alumni association	39.4
Candidate support organization	2.3
Sports or leisure group	15.2
Others	3.8
(N)	*(132)*

Source: Park and Shin (2005)

More Korean people are involved in at least one informal network (47%), yet nearly a half (51%) of the people connected with informal networks belonging exclusively to informal alumni circles (*refer to Table 5*) (Park and Shin 2005, 13). This is unique when compared with its neighboring countries; in Japan the most popular type of informal group is friends who have common hobbies and in Taiwan only one among ten of those in informal groups mention circle of classmates (Park and Shin 2005, 12). The prevalence of school ties in both formal and informal networks in Korea shows that school ties remain an important basis for social connections. This shows us that Koreans prefer to connect themselves to other people through informal friendship networks, which tend to be highly homogeneous, especially in social and cultural identities (Park and Shin 2005, 13).

Table 8. Informal group memberships

Types of informal group	**Percent affiliated**
Circle of colleagues who interact out of work	12.4%
Group at community schools or other place of learning	1.6
Circle of friends who share common hobbies or favorite past time	17.8
Circle of friends who do business together or help out each other	5.9
Informal credit/loan circle	3.6
Informal circle of alumni	51.3
Informal circle of veterans	0.4
Informal circle of hometown natives	2.1
Informal circle of parents with students	1.1
Informal circle of co-believers	0.8
Family gathering	1.6
Mutual aid circle	0.3
Clan meeting	0.8

General social gathering	26.4
Others	1.7
(N)	*(708)*

Source: Park and Shin (2005)

A further analysis shows that the number of associations or groups the Korean people join matters very little for trust, either generalized or institutionalized (Park and Shin 2005). When the EAB survey asked the standard interpersonal trust question, less than two-fifths (39%) of the Korean people expressed trust in other people (as compared to 29% for Japan, a surprisingly low figure, and 40% in Taiwan) (Woo et al. 2007, 22). Even in principle, a substantial majority were reluctant to trust most of those whom they do not know personally with only one-quarter of ordinary Koreans expressing their commitment limited to relatives and friends because they believed strangers, even competent ones, could not be trusted in the business context (Woo et al. 2007, 22). Table 2 shows a comparison of percentages of trusting people in selected countries, according to the World Value Survey.

Table 9. Comparison of percentages of trusting people in selected countries

Year	Korea	Japan	US	China	Taiwan	Philippines
1981	38.0%	40.8%	46.8%			
1990	34.2%	41.7%	50.0%	56.7%		
1995	30.3%	46.0%	35.6%	52.7%	41.8%	5.5%
2000	27.3%	43.1%	35.8%	54.5%		8.4%
Average	32.5%	42.9%	42.1%	54.6%	41.8%	7.0%

Source: World Value Survey

Several studies such as those published by IMD also report that Korean citizens' trust and confidence various political institutions and private sector institutions has continuously declined and that the decline is particularly pronounced for political trust (You 2005, 20).

Table 10. Institutional Trust and Social Trust in Korea, 1981-2000

Year	1981	1990	1995	2000
Confidence in political institutions:				
Court	3.16	2.75	2.62	
Police	2.97	2.51	2.47	2.46
Government			2.31	2.19

Political Party			2.07	1.76
Parliament	2.87	2.19	2.17	1.73
Civil Service	3.34	2.66	2.90	2.67
Army	3.40	3.05	2.84	2.71
Average	3.15	2.64	2.50	2.27
Confidence in private sector institutions:				
Church	2.77	2.63	2.39	2.52
Press	2.90	2.72	2.70	2.69
TV			2.66	2.69
Union	2.73	2.71	2.55	2.51
Major companies	2.58	2.17	2.23	2.16
Average	2.75	2.56	2.51	2.52
Social trust	**38.0%**	**34.2%**	**30.3%**	**27.3%**

Source: You (2005)

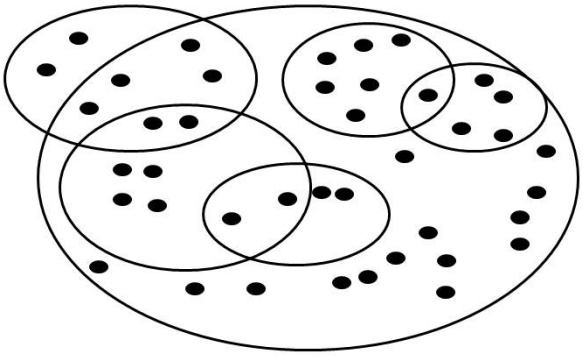
Why does social involvement not lead to higher trust among the Korean public? This is because the groups that Koreans tend to associate with are exclusive and composed of people with similar backgrounds (Park and Shin 2005, 13). By not having to overcome social differences, these groups are not likely to generate 'identity-bridging' social capital which can serve as a base for the kinds of networks that span culturally defined differences such as ethnicity, religion, and national origin (Wuthnow 2002, 670).

Rather than promoting generalized trust - the trust that involves strangers or the people whom one does not know personally is important for civic virtues, these exclusive membership groups affirms institutional trust - the type of trust in particular individuals or members of their group are likely to grow among those who share similar demographic backgrounds, or socioeconomic statuses may not contribute to the formation of a civic community (Dakhli and Clercq 2004). These associations tend to promote trust in members of one's own group and distrust towards others and thus in this regard, may actually promote 'unsocial' rather than 'social capital' outside of the group's 'radius of trust' (Park and Shin 2005, 13; Fukuyama 2001).

Francis Fukuyama, a leading scholar in the study of social capital, states that all groups, ranging from friends and cliques to NGOs and religious groups, embodying social capital have a certain radius of trust, that is, the "the circle of people among whom cooperative norms are operative" (Fukuyama

2001, 8). If a group's social capital generates positive externalities, the radius of trust can be larger than the group itself. However, if the group fosters cooperative norms only among the group's leadership or prominent members, then the radius of trust can be smaller than the membership of the group (Fukuyama 2001, 8). Fukuyama depicts modern society as a "series of concentric and overlapping radii of trust" as shown in Figure 2 below.

Figure 5. Networks of trust



Source: Fukuyama (1995)

According to Fukuyama (2001), Korea's low social capital society is "a byproduct of religion, tradition, shared historical experience, and other factors that lie outside the control of any government." Fukuyama states that in Korea as in other East Asian countries, social capital resides largely in families and a rather narrow circle of personal friends due to its familistic culture (Fukuyama 2001, 9). This makes it difficult for Koreans to trust those outside of these narrow circles of kinship. In addition, Korea's long roots of Confucianism characterized by rigid and strong hierarchical and highly patriarchal social structures formed a foundation which is difficult to build mutual respect and trust between citizens, and the consequences of these settlements last through generations (Halpern 2005, 269).

Woo, Kim, and Jang (2007) in a working paper for the Korea Development Institute titled, "Social Capital and Policy in Korea," also claim that historical forces such as the Korean War compelled individuals to distrust others for survival and self-preservation and that frequent dislocation during rapid

urbanization eroded the traditional sense of community (Woo et al. 2007, 11). Outdated laws and the lack of legitimacy of the legal authority also created distrust in the legal institutions in Korea (Woo et al. 2007, 12). The distorted development of the democratic policy process also created a low trust in the national government and other public institutions and pubic conflicts lead to even further distrust, forming a vicious cycle. (Woo et al. 2007, 12). The government's lack of conflict resolution due to the limitation of conflict management during the authoritative political regimes also contributes to the low trust in governments (Woo et al. 2007, 12).

While it may be true that generalized trust as well as forms and density of social interactions are shaped through historical forces, it is also true that "present-day social and political institutions and local, regional and national governments are also able to make an impact" (Stolle 2003, 22). The government policies on education, training, transport, the voluntary sector, family policy, crime prevention, and others are affecting social capital every day.

IMPLICATIONS: THE NEED FOR NEW GOVERNMENT ROLE IN REGIONAL CLUSTER DEVELOPMENT

Limitations

What is clear though from having examined DI though, is that the Korean government has limitations in directly fostering a habitat for innovation and entrepreneurship, specifically in artificially creating networks in regional clusters, which should actually grow "organically" over time with the accumulation of social interactions and norms. Fukuyama (2001) cautions that governments can have serious negative impact on social capital when they start to undertake activities that are better left to the private sector or to civil society.

For example, Sohn and Kenney (2007) argue that the Korean government's decentralization

policy is partially responsible for the lack of an innovative, high-technology, global-class cluster in Korea. They argue that the government's policy to expand away from Seoul diverted national support and investments away from the city, even though it had the greatest potential for experiencing university-industry interaction and entrepreneurial cluster formation (Sohn and Kenny 2007, 1001). Though the decentralization policy might have been effective for achieving regional equity, it concentrated resources for the development of innovative clusters in locations that had few pre-requisitions for being successful (Sohn and Kenney 2007, 1001).

Sohn and Kenney examine a variety of government programs and policies to prove that the decentralization policy assigned the lowest priority to Seoul's local government, yet do not provide any supporting evidence to argue that Seoul had the strongest support environment for entrepreneurship in Korea. While Seoul may have had the infrastructure for firms to flourish, it is hard to conclude that a vibrant, innovative cluster would have formed without high social capital. The Seoul Venture Town and the Seoul Business Incubator, two government programs aimed at supporting SMEs which had little progress in cluster effect can be stated as examples. Nonetheless, Sohn and Kenny make a point in concluding that the government actually discouraged individual and institutional entrepreneurship by being involved in the microlevel management (2007, 1002).

Opportunities

While the government has limitations in directly facilitating networks among entities and individuals it can support the next stage of DI's innovation habitat by strengthening mechanisms to promote social capital and facilitate social networks, which as presented earlier are the fundament components to creating an innovative cluster. One of the few studies on the government's role in promoting social capital in Korea conducted by the Korea Development Institute (KDI) developed a

tentative framework for social capital policy in Korea with social trust at the focal point (Woo et al. 2007, 13). The framework suggests three main approaches. The first is to strengthen institutions and norms informing democracy and the market economy (Woo et al. 2007, 13). The second is to nurture open and civic communities which hold memberships of individuals from diverse backgrounds (Woo et al. 2007, 14). The third is to cultivate social capital-friendly norms through education (Woo et al. 2007, 13).

There is still very little research conducted on "what works" in the promotion of social capital and Woo, Kim and Jang (2007) state that policy makers should be careful and conservative when it comes to promoting social capital because the knowledge of the formation of social capital is still very shallow (Woo et al. 2007, 14). In general, the realm of civil society is regarded as the most fundamental in the building of the attitudinal aspects of social capital, such as trust and cooperation (Stolle 2003, 20).

Korea's Civil Society

Unlike the civil societies in Western Europe, the civil society in South Korea did not emerge in a domain outside the realms of the state and market (H.R. Kim 596). The civil society emerged in a traditionally strong centralized state authority and thus developed not separately from the state, but as integrally related to the state, "part of the same organic whole" and this creates implications in terms of social capital (Hale 309). Although the civil society in Korea grew impressively in 1987, not only in terms of size and density but also in the influence they wielded in the policy-making arena (Koo, P. Kim, H.R. Kim), it is important to note that the civil society in Korea did not develop independently of the state, but still integrally, and thus is defined as a *statist model of state-society relations* (Hale 309).

In this model, the state and civil society are characterized by "mutually restricted cooperation" where the civil society completes, rather than diminishes the existence of the state (Hale 309). Thus the

state plays a strong role in the formation and ongoing activities of civil society organizations. The state must also protect the civil society and ensure its continued existence while simultaneously "restricting" the civil society's activities when the civil society poses a threat to the nation or the state (Hale 309-310).

At the present time, it is evident that civil society in Korea has become more active in presenting possible alternatives to meet societal needs, monitoring and criticizing the existing socio-political systems, and applying pressure for the sound development of broad areas in South Korean society (P. Kim 86). Bidget (2012) also highlights the emergence of a new form of collaboration between civil society and government. In the late 1990s, to deal with the sudden mass unemployment caused by the economic crisis, the South Korean government contracted a significant part of public works to civil society (Bidget 1221). The involvement of civil society organizations in the public work programs has been considered the first balanced collaboration between government and civil society (Bidget 1221, 2012). Also, whereas the government was used to designing laws through a typically top-down process, important welfare reforms began to be introduced through active lobbying by influential civil organizations such as the National Basic Livelihood System Act that came into effect in 2000.

Although the role of civil society has increased, it is premature to argue that civil society is an alternative institution to pursue objectives neglected by the state, or to state that civil society has been fully developed (H.R. Kim 608). It is possible, even in a statist model for the state and civil society to intimately cooperate with each other, especially when they are not in a conflicting relationship (Hale 309). The most recent trends and orientations still show a strong influence and control by public authorities on civil society groups that address social issues (T. Kim 1227). This may imply that the partnership between civil society and government that emerged in the framework of the late 1990s was an illusion in a South Korean context shaped by both a state-monitoring tradition and a recent liberal

orientation governed by an ideology of workfare (Bidget 1228, 2012).

Even scholars such as S. Kim who boldly asserts that “there no longer are civil society groups that are openly sponsored and controlled by the state” (“Contentious Democracy in South Korea” 58) acknowledge that governments give preferential financial support to NPOs that have been favorably inclined toward them and that the leadership composition of such civil society organizations has been affected by the government’s preferences (“Contentious Democracy in South Korea” 58). In fact, the state has been rapidly increasing financial support for civil society organizations since the late 1990s due to the policy change made in early 1999 promoting government support in the form of grants which is advocated by key civil society organizations as well (H.R. Kim 602).

Many scholars assert that the inability to develop independently from the state is the reason why civil society remains relatively immature even until this day. In order to increase social capital, the civil society should mature into an exclusive independent entity that can coexist between the state and the economy and should be able to present persuasive alternative programs for sustainable development (H.K. Kim 245). Ryoo claims that the complex relationship between the state and civil society should be considered in terms of “mutual empowerment and synergy” where civil society organizations and groups acquire their effective negotiation power to change political, social and cultural environments rather than passively carrying out state orders and responding to propaganda (Ryoo).

CONCLUSION

Clusters are increasingly attracting the attention of governments, businesses, and academics and practitioners as cluster-based economic development proves to be at the forefront of promoting innovation, productivity growth and regional development ("Competitive Regional Clusters: National

Policy Approaches" 2007). While the origins and developments of clusters vary around the world, the key contributing factors to the success of a cluster development, especially in the latter stage of its development, are intangible assets such as social networks and trust.

This paper attempted to contribute to the existing literature on the role of governments in cluster development by discussing the Korean government's evolving role in the promotion of regional clusters, in particular the government's role in the creation and development of DI. By examining DI's competitiveness through a number of key indicators such as UIG networks, studies show that DI is still not advanced enough in terms of inter and intra firm collaborations and networks to be considered as a regional or international scale innovation center. While the Korean government seems to have succeeded in developing excellent hardware such as DI's infrastructure, it has limitations in creating the software such as social networks and trusts. In this way, the DI experience provides useful insights for policy makers and cluster strategists interested in promoting regional clusters through government efforts.

However, the DI experience is unique and thus the DI practices and findings in this paper should be taken with caution when applying them to other contexts. To develop the findings of this study, further research can be conducted on specific government policies to promote social capital in regional clusters and their effect on innovation, productivity, and growth.

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