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The Making of a Science Town: The Case of Daedeok, Korea

Ho Yeon Kim*

Abstract : This paper provides a general overview and critical assessment of Daedeok Science Town (DST) in Korea, mainly through the lens of the related literature. DST symbolizes the government-led creation of a new science town and represents a bold attempt to consolidate national R&D efforts in a designated area with a view to supplying basic scientific knowledge to industries nationwide. It has achieved considerable success by improving the research environment and promoting venture spin-offs and network formation. However, while DST has played a pivotal role in ushering in the era of the knowledge-based economy, new measures are required for it to remain viable. To this end, efforts should be made to direct government support toward new firm establishment, finance, and tighter networking. DST also needs to host large corporations in the area as these could both act as a market for venture businesses and serve as providers of funds.

Keywords : Daedeok Science Town, knowledge sharing, venture firms, networking

1. Introduction

Daedeok Science Town (DST) epitomizes South Korea's efforts to boost science and technology, and it has been generally successful in meeting these expectations. Located in the heartland of Korea, DST is a favored destination for companies seeking technological excellence. Korea's commitment to the development of DST represents its aspirations of creating a world-class center for the development and commercialization of industrial concepts. The string of industrial complexes in DST has become the country's premier incubator of venture firms. Companies gravitate there to take advantage of the superior workforce, superb amenities, favorable funding, and incentive packages.

In the 1960s, the Korean economy grew swiftly in the field of light industry with the aid of foreign capital. However, from the 1970s, and owing to rapid developments in science and technology and their protection by developed countries, it became more difficult to maintain high economic growth and competitiveness without embarking on

* Associate Professor, Department of Economics, Sungkyunkwan University

independent efforts in research and development. In response to these challenges, the government began development of the complex in Daejeon City, the fifth-largest urbanized area in Korea. Following the establishment of Daedeok Research Complex (DRC) in 1973, the transfer of national research institutes has strengthened its function as a basic research hub. Thereafter, the research institutes of several private business groups were also established.

Currently, about 22,000 people work in DST research centers. The technology accumulated by the institutes and venture companies has created a large network of quality researchers. Advanced information and the research of core industries, production, distribution, and support facilities are also there, along with the bases of companies involved in electronics, information and communications technology, precision equipment, new materials, bioengineering and medical equipment.

Through an extensive survey of the existing literature on DST, this paper traces and critically evaluates its past achievements and suggests directions for further development. Most of the findings are from various surveys, including one by this author, administered to researchers and entrepreneurs in the area. The structure of the remainder of this paper is as follows. Section 2 provides a brief history of the science town. Section 3 traces its track record in terms of an improved research environment, the spin-off of venture firms, and network formation. Section 4 covers any current problems and section 5 concludes.

2. Development of Daedeok Science Town

1) Daedeok Research Complex

While still achieving an average annual growth rate of 10.4% during the 1970s, Korea began to look for a new engine for sustained development. The government found the solution in heavy and chemical industries, and felt the need for expanded R&D capabilities to back these up. At the same time, the overconcentration of population and businesses in the capital city area was at the top of the list of other problems to be tackled.

DRC was conceived in 1973, modeled after Tsukuba Science City in Japan. The original plan envisaged a new science town with 50,000 inhabitants to be completed by 1981 (Yu, 1985a). According to Oh (2000), the objectives of the development of DRC were threefold: first, creating a foundation for joining the ranks of advanced countries in the 21st century based on science and technology; second, fostering closer links among research institutes, academia, and industry through effective placement of government-supported research institutes, private research institutes, and universities; and third, establishing a pollution-free science garden city with cultural facilities.

Daedeok was chosen over four other candidate regions because of its superior accessibility, natural surroundings, and capacity to accommodate future growth.[1] With a total ground area of 27.8km^2, DRC was about the same size as Tsukuba City (See Area I in Figure 1). In the original master plan, 47% was allotted for educational and research purposes, 8% for residential area, 1% for commercial area, and

44% for green space. This is in sharp contrast with Tsukuba where 54% of the total space was set aside for education and research, 39% for residences, 3% for businesses, and only 4% for green space.

The new and relocated institutes began operation starting in 1978. Originally, DRC was slated to be a self-contained satellite city. However, with a change of plan, it was annexed to Daejeon City in 1983 to function as a subcenter rather than as a fully fledged city. In retrospect, this worked for the benefit of DRC in the sense that the residents could secure better living environment, amenities, and municipal services. The relocation of KAIST (Korea Advanced Institute of Science and Technology), a prominent research university, completed the first phase of the complex development. Table 1 shows the overall trend in the number of research institutes, universities, and more recently, business incubators in the area. There are now twice as many private institutes as government-funded facilities.

As a planned city geared toward attracting well-trained brainpower, Daedeok boasts a large pool of qualified researchers. By 2000, DRC had 4,214 PhDs, 4,606 Masters, 1,254 Bachelors, 1,489 research assistants, and 3,350 administrative staff within its jurisdiction (Cho, 2001). DRC currently absorbs more than 30% of total government R&D expenditure (Kim and Kang, 2006). Newly generated knowledge soon began trickling down to local industries. Kim (2003), for instance, found rapid growth of the information technology industry in the Daejeon area during 1995~2000, in terms of both backward/forward linkages and output/income multiplier effects.

2) Daedeok Technovalley

Recently, agile startup businesses have received considerable attention as a potential engine of regional innovation systems. Clusters of dynamic venture companies are now expected to contribute to employment, income, productivity, and overall competitiveness of the region.

The 1997 economic crisis kindled a fresh spurt of interest in the role of small venture companies equipped with innovative ideas. The Korean government intended to nurture venture firms as foot soldiers in overcoming the crisis, providing them with generous subsidies and various incentive packages. In the country as a whole, the number of firms categorized as “venture” grew from 500 in 1997 to about 6,000 in 2000. These mostly specialized in software, information technology, biotechnology, and precision

Table 1. Growth of Daedeok Science Town

Year	1979	1993	1997	2000	2004	2007
Government institutes	5	15	16	20	19	21
Private institutes	3	8	25	25	30	43
Universities	1	3	4	4	4	6
Business incubators				16	22	20

Sources: Cho (2001), Choi (2006) and Daedeok Innopolis Administrative Agency

machinery.

Manufacturing activities had been prohibited in the area by law since 1993 in order to keep the park from becoming another industrial district riddled with smokestacks (Shin, 2001). An area adjacent to DRC was then declared the Daedeok Technovalley (Area II in Figure 1) in 2000 as a part of a concerted attempt to build up capacity to emulate Silicon Valley. It is noteworthy that, for the first time, production facilities were allowed in the park in order to facilitate the commercialization of research outcomes.

3) Daedeok Innopolis

The greater Daedeok area was designated the Daedeok R&D Special Zone (or Innopolis) in 2005, a scheme intended to foster the commercialization of research. As shown in Figure 1, this encompasses the original complex, Technovalley, several conventional industrial estates (Area III), and a large greenbelt (Area IV) to the north. It is now 2.5 times the size of the original park.

Daedeok Innopolis has the goals of assisting technological development in the research institutes and rendering support for researchers. A special law passed in 2005 stipulated that the Ministry of Science and Technology should make efforts to facilitate networking among universities, research institutes, and business firms in the zone, with a view to effectively commercializing their outputs. As at 2005, 5,637 PhDs and 6,216 Masters in the Innopolis made up 57% of the workforce pool in the zone. The Innopolis as a whole had 21,019 domestic patents and 5,745 patents registered abroad, representing a substantial increase from the 7,097 domestic and 1,238 foreign patents in 1998, respectively (Cho, 2007).

Apparently, the constituents appear to be quite optimistic. By questioning 114 professors, students, entrepreneurs, and researchers in the area, Cho (2007) found that they are generally positive about the role of Innopolis and its future prospects in terms of collaboration, personnel recruitment, and living conditions, although they still acknowledge that access to suppliers and business services needs improvement.

3. Performance of Daedeok Science Town

1) Working conditions for researchers

Did DST deliver on its promise to provide a superior environment for producing new scientific knowledge? Given the stickiness of Seoul, the results are quite mixed. In 1984, only 60% of the 120 researchers surveyed indicated that they resided in DRC, while 33% commuted from surrounding areas, and 7% still lived in the capital city region. All visited Seoul at least once a week. Forty-one percent went there for family reunions, surpassing the 33% for business purposes (Yu, 1985b). Kim (1989) solicited opinions on working conditions from 200 researchers in six government institutes. The majority (71%) responded that there was room for improvement in research management efficiency, mainly because of problems with poor administrative support systems.

On the other hand, Hong (1997), using a survey of 190 researchers, confirmed a high degree of

satisfaction with the research environment. Rho (1997) also found that researchers were quite happy with their natural surroundings and ease of commuting, although there was still some discontent with daily inconveniences, including a lack of hospitals, shopping centers, and cultural/recreational facilities.

Starting in the mid-1980s, the monopoly of government institutes was severely eroded by the growth of R&D capabilities in the private sector. The so-called "project-based system" was adopted in 1995 in an effort to reform these government institutes. They suddenly became exposed to head-to-head competition against private institutes. The decay of morale was inevitable due to the loss of autonomy and the top-down assignment of research projects (Cho, 2002). The system also brought about the more flexible adjustment of team size commensurate with the number of contracts signed, giving rise to preferences for more lowly-remunerated temporary workers over permanent employees. Unstable job status even led many researchers to refer to themselves as "disposable beings".

Park (1996) surveyed 547 professors and researchers in public and private institutes, only to confirm that professors as a group had the highest level of job satisfaction and were eager to keep their employment. University professors can usually exercise some liberty in selecting their research topics, a luxury that researchers elsewhere do not enjoy. It is noteworthy that researchers at government-run institutes had the least self-esteem in terms of job characteristics, opportunities for promotion, social recognition, and job security among the three groups. Things were hardly better for younger workers. According to Moon and Song (2002), most of the 154 IT firms surveyed were having difficulty recruiting qualified workers, while researchers felt underpaid with little prospect for career development.

To complement earlier findings, this author conducted a survey in February 2007 on 202 researchers in DRC. Table 2 reports how each local factor, if provided, affects innovative productivity. In particular, researchers were highly appreciative

Table 2. Local factors stimulating innovation

Factors	Positive	Negative	Indifferent	Unavailable	Total
Local infrastructure/facility	138	18	36	7	199
Proximity to co-researchers	119	25	47	6	197
Proximity to related business	100	30	65	3	198
Proximity to universities	114	29	52	3	198
Proximity to libraries	146	16	35	3	200
Social environment	92	40	45	22	199
Proximity to good manpower	103	43	40	13	199
Safety and tranquility	143	22	30	3	198
Low cost of living	71	58	41	26	196

Source: Author's survey (2007)

Table 3. Organizational factors stimulating innovation

Factors	Positive	Negative	Indifferent	Unavailable	Total
Job security	116	53	21	9	199
Stable availability of fund	90	64	38	6	198
Autonomy in research	93	62	35	9	199
Flexible time allocation	108	43	35	11	197
Chance of promotion	80	48	63	8	199
Stable salary	72	88	30	9	199
Pay for performance	69	74	47	9	199
Social prestige	73	55	61	10	199

Source: Author's survey (2007)

of the high quality of infrastructure and facilities, proximity to libraries, and safety and tranquility. The low quality of social (cultural, educational, and recreational) environment and the rising cost of living, on the other hand, were detrimental to productivity. Table 3 further reveals that the researchers were generally satisfied with job security at the institutes to which they belonged, as well as with their flexibility in time allocation.

As the data contain detailed information on the respondents' characteristics, achievements, and patterns of maintaining contacts, the results of the survey may reveal the effects of local factors and networking on the productivity of researchers in DST. While specific analyses are relegated to future study, they would hopefully confirm the notion that face-to-face communication is still a major driving force of innovation and that agglomeration is good, not only for traditional manufacturing activities, but also for knowledge workers who exchange ideas through formal and informal relationships.

2) Venture spin-offs

In 1994, there were only 25 spin-offs in DST (Hwang, 2004). The general atmosphere was not friendly to would-be entrepreneurs until the late 1990s. According to Kang et al. (1997), researchers were not allowed to use their findings for their own private benefit; indeed, only four of the 27 institutes surveyed allowed this. Within academia, 53% of 102 university professors responded they were ready to establish their own businesses if circumstances permitted. However, they were afraid of unseen barriers such as the high cost of securing capital and a lack of managerial expertise.

Many researchers lost jobs at the outbreak of the economic crisis, and this unwittingly triggered a process of creative destruction, with the 2,800 people dismissed in 1997~1998 representing some 16% of all employees in DRC. Some private institutes closed down, while others reduced their number of personnel by up to 40%. The retirement age at government institutes fell from 65 to 62 years (Lim et al., 2004). This string of events accelerated the spin-off of startup firms.

As the largest research center in the park, ETRI (Electronics and Telecommunications Research Institute) actively supported spin-off firms. According to Lee (2003), 576 researchers left ETRI in the two-year period following the crisis. There were 67 ETRI spin-offs in the precrisis years, but this had skyrocketed to 220 by 2001. From these, 125 found homes in DRC. Kee et al. (1997) noted ETRI's efforts to support its former employees by providing startup funds, test facilities, and quality assurance services. In particular, researchers embarking on a business venture were granted leave of up to three years as insurance against failure. In general, former employers, including ETRI, act as consumers for the venture firms' products, thereby assisting these firms to go through the tough initial phase and muster enough strength and competitiveness to stand on their own feet.

Along with a rich pool of human resources and sophisticated physical infrastructure, various support packages for venture startups provided by local public agencies have also played a vital role. As of June 2008, there are 18 business incubators in Daedeok nursing 314 firms with 3,107 employees, most of which are headed by former researchers. Being an internationally recognized research university, the KAIST is also a major operator of a business incubator providing offices, test equipment, and technology evaluation serviced for some 90 prospective entrepreneurs. Interestingly, many of the 118 graduates or tenants of the business incubators responded to Sung et al. (2003) that "they did it all" without external support, which the authors seriously doubted.

What are the general characteristics of the venture firms? Yang and Jeon (2004) observe that startup firms heavily invest in R&D compared with marketing, have flexible organizational structures in which roles and duties are clearly defined for quick decision making, and yet have limited external sources for operating capital. In addition, the founders appear to retain a key feature of Korean entrepreneurship; they exert considerable influence on business affairs. By investigating 100 startup firms, Hwang et al. (2004) identified support by senior management as a crucial element in the adoption and implementation of information technology. Hwang and Moon (2007) further reported on the positive role of supportive CEOs in 117 venture companies in adopting various e-business tools. This indicates that they are ready to take risks and adopt new technology, and do not hesitate in investing in the equipment needed.

3) Network formation

A successful regional innovation system requires a good cluster of firms, universities, research institutes, governments, and financial services that foster interaction and the transfer of explicit and implicit (tacit) knowledge. An efficient flow of knowledge is what sets innovative clusters apart from the mere concentration of seemingly related entities. Frequent interpersonal contacts, formal or informal, are essential to build the trust needed for any kind of collaborative work. Not surprisingly, the 260 researchers who responded to Kim and Han (2004) recognized that factors such as open communication and expected contribution affected the degree and amount of knowledge sharing as well as an objective evaluation and reward scheme.

Creating strong linkages between the R&D sector and industrial communities was somewhat implausible in the early years of DRC. Yang (1988) surveyed 39 firms that cooperated with government-run research institutes. They responded that technical assistance and technology transfer were often hampered by the small size of the domestic market and fluctuations in the demand for high-tech products. In their view, what was also responsible was a lack of understanding as to what the other party needed, not to mention the inconvenient location of the corresponding research institutes.

There have been criticisms that the park has seen only a few networks created among its research institutes. Castells and Hall (1994) concluded that no milieu of innovation was formed in the Daedeok area, and no linkage or application of any kind could be found in the first two decades of its existence. It is often argued that DRC has not developed into a fully fledged innovative cluster because of the lack of cultural and social amenities, easy access to financial and commercial centers, diversified producer services, and an efficient market mechanism that stimulates research of an applied nature.

Shin (2004) found few linkages formed among the 100 firms in incubators and the R&D sector. One-third of the respondents obtained information from other firms in the same industry, 25% from research institutes, and only 12% from universities. As Sohn and Kenney (2007) point out, the traditional role of Korean universities was supplying well-educated graduates to industries, rather than transferring their research results. Some were more successful than others. ETRI, for example, accumulated some 1,400 cases of technology transfer to 2,700 firms by 2004, although two-thirds went to firms in the capital region (Kang, 2006). It should be stressed, however, that ETRI's achievement does not represent the general health of research-industry networking, as it absorbs 78% of all royalty and license fee revenues generated in DRC.

After examining 135 firms in business incubators in Daejeon, Shin (2000) confirmed that most new entrepreneurs were former researchers from the same area. They procure labor, capital, technology, and information locally, but source raw materials from and market their products to outside the region. Hwang (2004) reports on some illuminating results of a survey on 137 IT firms in Daejeon: 58% of new recruits were from nearby areas and 22% were from the capital city region. Young firms value R&D more than marketing, while the opposite is true for established firms. For order entry, 35% are from Daejeon and 45% are from the capital, while the corresponding figures for order placement are 45% and 40%. Most financial and legal services are contracted locally, while half of all marketing efforts are outsourced to Seoul. Lastly, 89% actively participate in joint research with suppliers, customers, and competing firms.

4. Remaining issues

There are several issues to be addressed for the continued growth of Daedeok Science Town. First, it is ironic that the spacious layout, intended to provide comfortable environment for creative research, inadvertently hampers the efficient flow of knowledge and interpersonal contacts. The

tranquility of the surroundings is generally regarded as the best feature offered by DST. However, self-sufficient and sparsely located units often act as physical barriers to face-to-face communication (Kwon, 2000).

Second, since government institutes specialized in large-scale and future-oriented areas such as nuclear energy, information technology, biotechnology, and aerospace, they had few potential linkages with local businesses. For example, they were unable to link with labor-intensive local industries specializing in leather and textiles. Given their role of providing breakthrough knowledge at the national level, it is only natural that they contributed little to local industries. There is simply too big a gap between what local firms (other than high-tech ventures) require and what government-run institutes can provide. As Sohn and Kenney (2007) correctly point out, decentralization in Korea has involved the movement of functions outside Seoul, while control remained centralized. It also has meant that efforts to encourage the development of innovative clusters have been concentrated in locations with few prerequisites for success. This is gradually changing with the central government's diminishing grip on the actions of local officials.

Third, most venture CEOs are scientists and engineers by training who lack knowledge in humanities and social sciences, and are experiencing problems in devising effective strategies to attract capital, package their ideas, and market products. For example, Cho (2006) notes that venture firms in DRC pay little attention to exchange rate risk. In fact, about half of the 75 surveyed firms were making decisions regarding risk management and currency rate forecasting in quite an arbitrary manner, without any outside help from experts in the field.

5. Conclusion

This paper has provided an overview of Daedeok Science Town in Korea. DST represents a bold attempt to concentrate national R&D efforts in a designated area with a view to supply basic scientific knowledge to industries nationwide. Daedeok symbolizes the creation of a science town led by the government, which also shows that it takes much more than just thoughtful planning to properly nurture the settlement.

DST has achieved considerable success with tangible benefits to industries. Overcoming a variety of obstacles, it has played a pivotal role in ushering in the knowledge-based economy. People there are now realizing the importance of marketing efforts for the successful transfer of technology. To remain viable, there needs to be a financial market to effectively channel funds to venture companies. They also need large corporations in the area both to act as a market for venture businesses and to serve as a source of funds. Lastly, more government support should be directed toward new firm establishment, finance, and new sources of growth such as overseas marketing.

Note

1. The romanization of Korean names has undergone several changes over the years. For example,

Daeduck, Taeduk, and Taedok in the literature all refer to the same location.

References

Castells, M. and P. Hall, 1994, *Technopolis of the World: The Making of Twenty-first Century Industrial Complexes*, London: Routledge.

Cho, Dae Woo, 2001, "The role of business schools in Daedeok Valley (in Korean)," *Studies in Management and Economics*, 24(1), pp.131-150.

Cho, Dae Woo, 2006, "Exchange rate risk management of venture firms in Daedeok Valley (in Korean)," *Studies in Management and Economics*, 28(2), pp.59-84.

Cho, Dae Woo, 2007, "Business environment in Daedeok R&D Special Zone (in Korean)," *Studies in Management and Economics*, 30(1), pp.61-79.

Cho, Surin, 2002, "A study on the changes in science-technology management policies and the reactions of research workers: Focused on the government institutes in Daeduk Research Complex (in Korean)," *Information and Society*, 4, pp.34-62.

Choi, Young Chool, 2006, "Prioritizing the critical factors associated with the regional innovation system in Korea, with particular reference to Daedeok Valley," *International Review of Public Administration*, 10(2), pp.49-59.

Hong, Hyung Deuk, 1997, "Regional innovation systems in Daejeon (in Korean)," *Journal of the Korean Association for Policy Studies*, 6(2), pp.101-127.

Hwang, Kyung Yun and Hee Cheol Moon, 2007, "Factors affecting the intensity of E-business usage and performance of venture firms in Daedeok Valley and Hsinchu Science Park (in Korean), *The e-Business Studies*, 8(2), pp.3-32.

Hwang, Kyung Yun, Hee Cheol Moon and Woo Yong Song, 2004, "Adoption and implementation of information technologies in Daedeok Valley venture firms (in Korean), *Venture Management Studies*, 7(1), pp.37-64.

Hwang, Joo Seong, 2007, "IT cluster evolved from research park: Taeduk Valley in Korea (in Korean)," *Journal of the Economic Geographical Society of Korea*, 7(3), pp.359-384.

Kang, Byung Su, Pan Wook Kim and Deog Seong Oh, 1997, "Cooperative strategies of advanced technology and regional development: With relevance to nurturing venture business in Taedok Research Complex," *The Journal of Korean Planners Association*, 32(5), pp.351-372.

Kang, Hyun Soo, 2006, "A study on the roles of national laboratories in the regional innovation systems: Comparative analyses of Taedok Science Park in Korea and some European experiences (in Korean)," *Journal of the Korean Society of Regional Geography*, 12(1), pp.108-123.

Kee, Young Seok, Eui Young Yun and Tae Bum Yoon, 1997, "Technology policy for endogenous regional development: The case of Daedeok (in Korean)," *Journal of Korean Association of Governmental Studies*, 9(1), pp.97-118.

Kim, Dong Young and In Soo Han, 2004, A study on individual and organizational factors affecting knowledge sharing-Focused on the R&D Organization in Daedeok Science Town (in Korean)," *Studies in Knowledge Managemen*t, 5(1), pp.83-99.

Kim, Neung Jin, 1989, "R&D management of government institutes in Daedeok (in Korean)," *Studies in Management*, 5(2), pp.97-119.

Kim, Tae Myung and Young Tae Kim, 2003, "Regional economic effects of the high-tech venture firms in Daedeok Valley (in Korean)," *Venture Management Studies*, 6(1), pp.107-140.

Kwon, O-Hyeok, 2000, "Strategies to create a new industrial district of Taedok Research Complex by evaluating R&D productivity (in Korean)," *Journal of the Korean Regional Development Association*, 12(1),

pp.17-40.

Lee, Sung Cheol, 2003, "Building an innovation system of Daeduck Valley based on knowledge production network (in Korean)," *Journal of Korean Geographical Society*, 38(2), pp.237-256.

Lim, Deok Soon, Wang Dong Kim and Jeong Hwa Yu, 2004, "Development of Daedeok Research Park and international comparisons (in Korean)," *Journal of Korea Technology Innovation Society*, 7(2) pp.373-395.

Moon, Hee Cheol and Woo Yong Song, 2002, "Manpower management in Daedeok Valley IT industry (in Korean)," *Studies in Management and Economics*, 25(1), pp.39-59.

Oh, Deog Seong, 2000, "Technopolis and the promotion of high-tech venture businesses: The case of Taedok Research Complex," *Journal of the Korean Regional Development Association*, 12(3), pp.45-61.

Park, Dae Shik, 1996, "Job satisfaction of researchers in Daedeok Research Park (in Korean)," *Studies in Social Sciences*, 7, pp.199-212.

Rho, Tae Cheon, 1997, "The research environment of Taeduk Research Complex and the development directions in the future (in Korean)," *Journal of the Korean Institute of Industrial Educators*, 22(1), pp.156-169.

Shin, Dong Ho, 2000, "Networks of high-tech venture firms in Taejon (in Korean)," *Journal of the Korean Regional Development Association*, 12(1), pp.1-15.

Shin, Dong Ho, 2001, "An alternative approach to developing science parks: A case study from Korea," *Papers in Regional Science*, 80, pp.103-111.

Shin, Dong Ho, 2004, "R&D networks of technology-intensive firms of Daeduck Research Complex (in Korean)," *Journal of the Korean Regional Development Association*, 16(1), pp.1-22.

Sohn, Dong Won and Martin Kenney, 2007, "Universities, clusters, and innovation systems: The case of Seoul, Korea," *World Development*, 35(6), pp.991-1004.

Sung, Tae Kyung, David V. Gibson and Byung Su Kang, 2003, "Characteristics of technology transfer in business ventures: The case of Daejeon, Korea," *Technological Forecasting and Social Change*, 70, pp.449-466.

Yang, Tae Yong and Eui Ju Jeon, 2004, "A study on impeding factors of venture firms in Daedeok Valley," *Journal of Korea Technology Innovation Society*, 7(2), pp.305-324.

Yang, Young Shik, 1988, "Development and diffusion of technology in Daedeok Research Park (in Korean)," *Studies in Economics*, 4, pp.23-64.

Yu, Wan Jong, 1985a, "A study for application scheme of technopolis to Daeduk Science Town (I) (in Korean)," *The Journal of Korean Planners Association*, 20(1), pp.189-201.

Yu, Wan Jong, 1985b, "A study for application scheme of technopolis to Daeduk Science Town (II) (in Korean)," *The Journal of Korean Planners Association*, 20(2), pp.164-178.

교신: 김호연, 서울시 종로구 명륜동 3가 53, 성균관대학교 경제학부, Tel: (02) 760-0436, Fax: (02) 744-5717, E-mail: hykim@skku.edu

Correspondence: Department of Economics, Sungkyunkwan University, Seoul 110-745, Korea, Tel: +82 2 760 0436, Fax: +82 2 744 5717, E-mail: hykim@skku.edu

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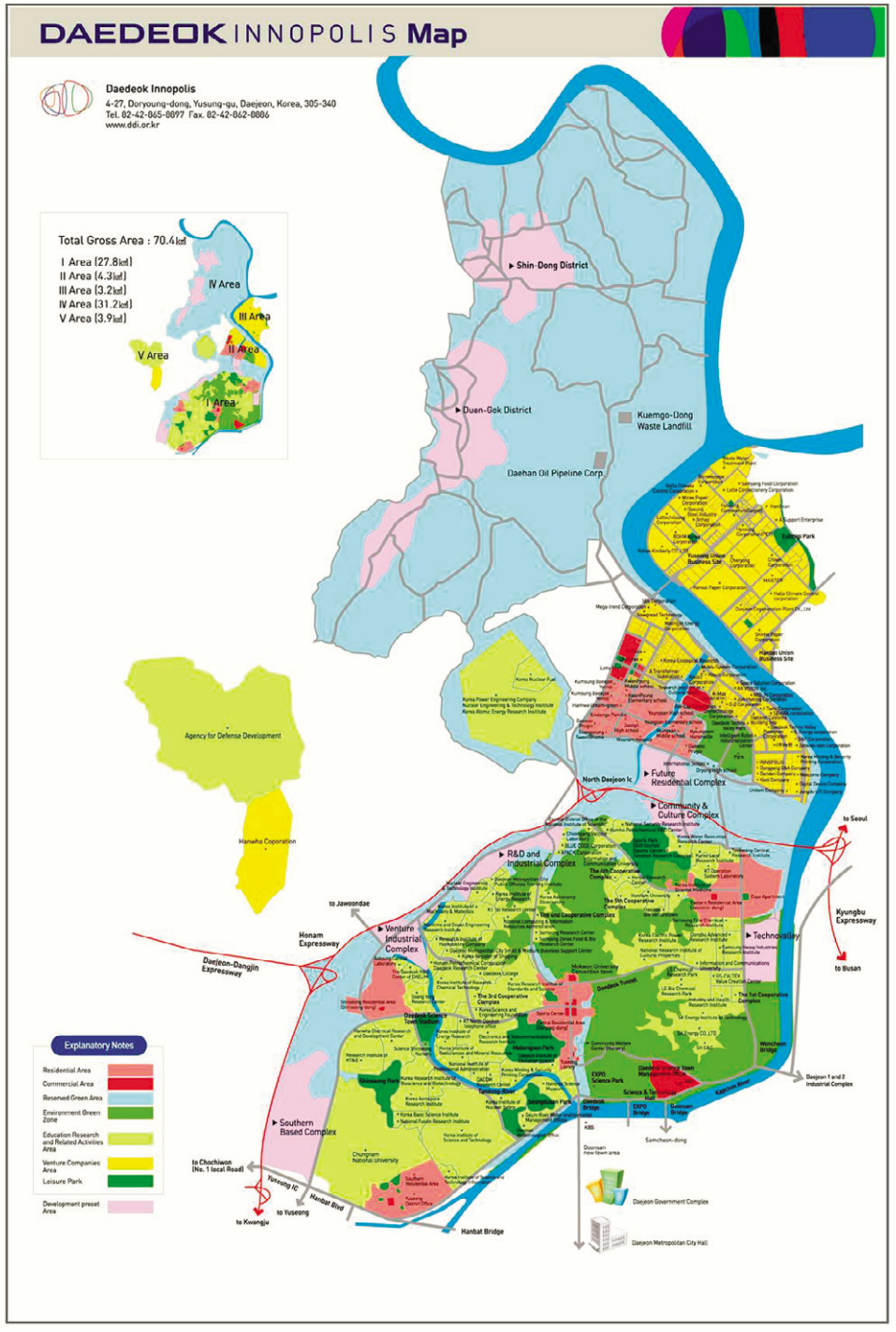

Figure 1: A map of Daedeok area

Source: Daedeok Innopolis Administrative Agency

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과학도시의 생성과 발전: 대덕연구단지의 경우

김호연*

요약: 본 논문은 기존 문헌의 광범위한 검토 및 비교분석을 통해 대덕연구단지의 조성과정을 살펴보고 그간 도출된 성과에 대해 고찰한다. 대덕단지는 국가적 연구개발 노력을 특정 지역에 집중하여 전국의 산업 전반에 기초 과학기술을 제공하려는 노력의 일환으로 구상되었다. 대덕은 정부 주도로 건설된 새로운 과학도시의 상징으로서, 향상된 연구환경을 제공하고 벤처기업의 창업을 활성화하며 산학연 네트워크를 창출하는 등 상당한 수준의 성공을 거둔 것으로 평가된다. 전반적으로 지식기반경제의 도래를 앞당기는 긍정적 역할을 수행했음이 인정되나, 대덕단지의 활력을 유지하기 위해서는 신규 업체의 설립, 해외 마케팅, 자금조달, 보다 긴밀한 네트워크 구축 등에 있어 정부의 지속적인 지원이 필요하다. 또한 벤처기업의 판로 및 자금원으로 기능할 수 있는 대기업들을 해당 지역에 보다 적극적으로 유치해야 할 것이다.

주요어: 대덕연구단지, 지식공유, 벤처기업, 네트워킹

* 성균관대학교 경제학부 부교수