

Boosting Enterprise-Support Services for Regional Industrial Development in Korea

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우리나라 기업지원서비스의 유형과 활성화 방안

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Abstract : This paper seeks to produce a typology of enterprise-support services. Drawing upon this typology, this study will attempt to identify the status quo of the government enterprise-support services system and also examine the demand for and supply of these services according to regional differences and industrial characteristics (old versus new). Based on results of the survey taken in the Seoul software industry cluster especially around the Seocho, Gangnam-Gu, the Daejeon ICT industry cluster and the Gumi electronics industry cluster, it can be said that the demand for and supply of enterprise-support services are differentiated by the nature of an industry, the characteristics of a region and the growth stage of a firm. Finally, some policy suggestions will be addressed.

Key Words : regional innovation system, core competencies, producer services, enterprise-support services, and regional industrial development.

요약 : 이 논문은 기업지원서비스의 유형화를 제시하고, 이러한 유형화를 토대로 우리나라 기업지원서비스의 현황을 파악하고자 한다. 또한 지역차이와 산업특성에 따른 기업지원서비스의 수요와 공급패턴을 분석한다. 서울소프트웨어산업 집적지(강남·서초구 일대), 대전의 ICT산업 집적지, 그리고 구미의 전자산업 집적지에 대한 설문지와 기업사례 조사를 바탕으로, 기업지원서비스의 수요와 공급이 산업특성, 지역의 성격, 그리고 기업의 성장단계에 따라 차별화된다는 것을 밝혀 내었다. 이러한 연구결과를 토대로 몇 가지 정책적 시사점을 제시하였다.

주요어 : 지역혁신체제, 핵심역량, 생산자서비스, 기업지원서비스, 지역산업발전

1. Introduction

As the vitalness of a knowledge-based economy in economic development has been widely recognized, the construction of a regional innovation system (RIS) has been accepted as a new paradigm for regional industrial development (Cooke, Uranga and Etxebarria, 1998). Since the forming of the RIS is recognized as an endogenous regional development strategy through amplifying regional innovation potentials, the nurturing of enterprise-support services necessary to encourage industrial clustering

and networking can be regarded as one of the most significant elements of the RIS.

The constructing of an enterprise-support service by the public sector can thus, be thought of as a critical policy tool in enhancing the competitiveness of firms through the accumulation of their core competencies and outsourcing of their complementary assets. At the same time it also can be regarded as a major policy tool to elevate the competitiveness of regions through the accumulation of the assets necessary for industrial development. In this regard, the

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broadening and upgrading of enterprise-support services seem to be no more than a regional industrial development strategy, which seeks economies of scope for firms and economies of scale for regions by enhancing the RIS.

In this paper, we will explore the present conditions and problems of government's enterprise-support services in Korea. We will then examine the demand for and supply of these services according to regional and industrial (old versus new) characteristics. In conclusion, we will consider the implications for broader policy issues.

2. Definition and Typology of and Provision of Enterprise-support Services

1) Definition and typology of enterprise-support services

Before examining the realities of the enterprise-support services system in Korea, there is a need to clarify the definition of the term enterprise-support services. Assuming that a firm's value-chain may be divided into the following: before production, production process, sale, and after sale, firms require a variety of services according to their value-chain including financial services, R&D, advertising, business counseling, technical consulting, safety, quality control, marketing, legal and accounting services, training and so on. The final demands for these services are in effect oriented to direct producers rather than individual consumers. These services are commonly named the term producer services (Marshall, 1985). That is, producer services are defined as those services that are intermediate inputs to other productive activities rather than being final consumption, in spite of some confusion and ambiguity in definition in the sense that a great deal of producer services are actually provided to even other service firms (Morris, 1988).

In this regard, enterprise-support services can be referred to as producer services-like, i.e. intermediate inputs needed for firms to operate their businesses and provided by public sector or non-profit agencies across their value-chain. Enterprise support services are provided by public or quasi-public agencies in many cases in order to enhance small and medium-sized enterprises' (SMEs) competitiveness. For SMEs, there can exist the opportunity to create core competencies and the capability to update the latest technology and information through the provision and linkage of external specialized business services (OECD, 1995). In this manner, producer and business services belong to the sphere of enterprise support services including finance, manpower, location (premises & sites), training and education, technology (and R&D), marketing, management consulting and so on. More importantly, enterprise support services can embrace cooperation and brokering services among individual companies and public organizations and networking services such as forums, conferences and seminars being held. These types of services are strongly recommended by the OECD (1995) to encourage networking through cooperation and competition among private and public spheres.

Where specialized services are provided, there is a likelihood a mismatch between market demand and supply may occur, leading to market failure and hence underproduction. If these services could be provided by the intermediation of the public sector, underproduction and market failure for these services, and thus social costs could be significantly avoidable.

Since the term enterprise-support services include all the services related to a firm's operation, it seems difficult to formulate them clearly. Thus, a sub-sectoral classification of enterprise-support services is needed both for theoretical clarification and empirical purposes. Following the categorization of Gibb and Scott (1986) on SMEs assistance policies and services provided: the provision of information; consulting; education and training; and the provision of

Table 1. Types and listings of enterprise-support services

	Intra-organization				Inter-organization	
	Mobilization of resources		Consultancy		Information	
	Premises & environment	Advice & direct support	Reception, facilities and basic information, referral	Professional information services	Cooperation & Brokering	Networking
Finance						
Equity finance	SME-specific training	Business planning	First-stop-shops	Legislation	SME-specific strategic measures	
	SME management	Business units	Official registration and documentation	Market information (incl. export markets and public procurement)	Trade missions	Conferences & seminars
Loans	Start-up	Business units	Advice on functional areas of business activity incl. marketing, design, finance, production, etc. Follow-up and accompanying measures		Supply chain development	Buyers' exhibitions
	Growth and Development	Technology parks	Consultancy (general management, quality, health & safety etc.)	Company & Finance	Cluster promotion	Trade fairs
Loan (direct & mutual) guarantees	Conversion courses		Development of business contacts (assistance with business cooperation, commercial agents, distribution, joint ventures etc.)	Technical - standards & certification - patents & copyrights - specific areas (e.g. environmental)		Promotion of networking
Grants and subsidies (e.g. participation in trade missions, assistance to the unemployed)	Targeted training (IT experts, women entrepreneurs etc.)		Mentoring	Promotional activities		
			Schemes to provide direct experience (e.g. of foreign markets and business practices)	Provision of facilities (e.g. meeting and office facilities, video-conferencing)		
			Initial diagnosis			
			Signposting			

Note: this categorization of enterprise-support services corresponds to that of the European Union (EU) (2001)

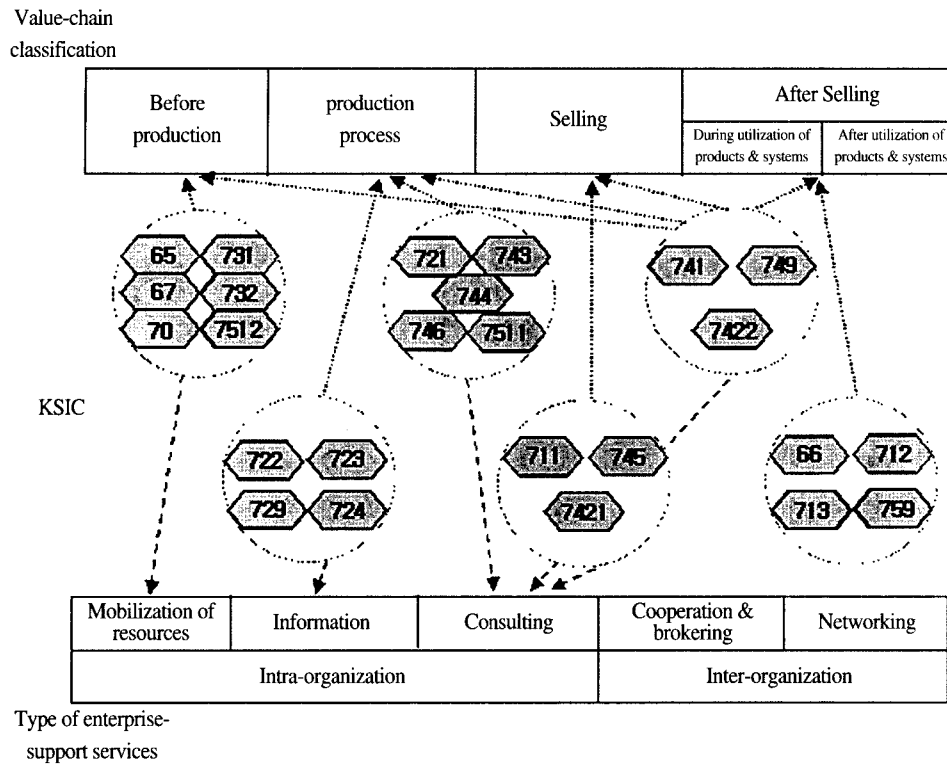


Figure 1. Typology of enterprise-support services corresponding to value-chain and KSIC

Notes: the classification of producer services according to KSIC is as follows:

- 65 (Financial institutions, except insurance and pension funding), 67 (Activities auxiliary to financial intermediation), 70 (Real estate activities), 731 (Research and experimental development on natural sciences and engineering), 732 (Research and experimental development on social sciences and humanities) and 7512 (Labor recruitment and provision of personnel)
- 722 (Software consulting and supply), 723 (Data processing and computer facilities management services), 724 (Database activities and on-line information provision services) and 729 (Other computer activities)
- 721 (Computer systems design and consulting), 743 (Architectural, engineering services), 744 (Scientific and technical services), 746 (Specialized design services) and 7511 (Facilities support services)
- 711 (Renting of transport equipment), 745 (Advertising) and 7421 (Market research and public opinion polling)
- 741 (Legal, accounting and tax preparation services), 7422 (Business and management consulting activities) and 749 (Other professional, scientific and technical services)
- 66 (Insurance and pension funding, except compulsory social security), 712 (Renting of machinery and equipment), 713 (Renting of personal and household goods) and 759 (Other business support services)

additional resources, a typology of government's enterprise-support services are made possible: the mobilization of resources, consulting, information services, cooperation and brokering, and networking services. Table 1 illustrates some forms of enterprise-support services compared with those of the EU. Also, it gives a listing of enterprise-support services that can be provided by the public sector. Although

the range of these services is very broad, the scope, significance and preference of their provision can be differentiated by region- and industry-specific conditions.

Figure 1 schematically shows how a classification of producer services by the Korean Standard Industry Classification (KSIC) are inter-related with a typology of services by function and the value-

chain of enterprise-support services. Two points can be made from this kind of schematization. First of all, there is no type of service equivalent to cooperation and brokering and networking services, which means that there is likely to be a market failure in the provision of these types of services. It should be stressed that since the SIC ex post reflects the trend of industrial development, these functions and services have not been yet classified into an independent type.

Second, producer services firms tend to migrate towards large metropolitan areas. That is, high-order services are concentrated in the capital region especially for Korea. Thus, it is found that there is a severe regional inequality and gap in the provision of these types of services. By implication, there may exist a market failure in that enterprise-support services mainly provided by market mechanism, which belong to the spheres of the mobilization of resources, information and consulting, are location-wise unevenly distributed in their provision. Although these types of services are inter-regionally tradable, face-to-face contacts is vital in providing such high quality services.

2) Provision system of enterprise-support services in Korea

(1) Provision of enterprise-support services by the public (or non-profit) sector

As listed in Table 2, the results of KIET's (1999) survey on the present conditions of local SME agencies' support functions are reconstructed by the typology of enterprise-support services made in the previous section. They show how and what enterprise-support services are provided. As implied in the previous section, a variety of services are being provided, including financing and taxes, training, business and technical consulting, marketing, information services and promotion services for networking, brokering and cooperation between public and private sectors.

Central and local governments have recently

designed and implemented a number of enterprise-support policies to promote and enhance regional industries (see Figure 2). Although it is difficult to differentiate them clearly because they have conveyed the policy aims of encouraging both the spatial network formation of related functions and the activation of technological innovation, they can be classified into two types: business location (premises) assistance policies; and innovation support ones. Among the following four forms of policies undertaken, the first and second type policies are oriented towards business location (premises) support policies, while the third and fourth policies towards innovation assistance policies.

First, there are business location (premises) assistance policies for venture firms and start-ups. For example, they include the S/W Support Center, IT-Business Incubators, IT-SoC Support Center, and the S/W Promotion District (see Figure 2). Second, the central government has attempted to upgrade existing industrial premises and estates through various, but overlapping and redundant, location (premises) policy initiatives, which embraces the High-tech Industrial Park, New Technology Nurturing Project, Techno-Park, Start-up Nurturing Center, Districts for promoting ventures business development and the Venture Business Cluster. Third, the central government has pursued local science and technology promotion programs directed to networking industry and academy for the further nurturing of SME's innovation capabilities. Some ministries such as the Ministry of Science and Technology, the Ministry of Commerce, Industry and Energy, the Small Medium Business Administration, the Ministry of Information and Telecommunications, and the Ministry of Construction and Transportation have supplied technical assistance through the intermediation of universities or as a part of location-support strategies. These projects include the Regional Research Center (RRC), the Sanhakyong Consortium, and the Technology Innovation Center, etc. Finally, local governments have designed and undertaken their own specific

Table 2. Provision of enterprise-support services by local SME assistance agencies

		Local government	SMBA regional office	SBC regional office	
Mobilization of resources	Finance and Taxes	Business restructuring loans	◆◇	×	◆
		Cooperative program loans	◇ ×	×	◆
		Business stability loans	◆	◇	◆
		Maximum total amounts of loans of the Bank of Korea	×	◆	◆ ×
		Start-up and venture business Loans	◆◇	×	◆
		Venture funds management	◆ ×	×	×
		Angel club assistance	◆ ×	◆◇ ×	×
		Special assistance areas	◇ ×	×	×
		SME technology innovation Business	×	◆	×
		Distribution sector restructuring Assistance	◆◇ ×	×	×
	Training	Management training	◆◇ ×	×	◆
		Technology training	◆◇ ×	×	◆
		Employment exhibitions	◆◇ ×	◆◇ ×	×
		Employment office & information	◆ ×	◆	×
	Location	Local industrial park	◆ ×	×	◆ ×
		Rural industrial park	◆ ×	×	◆ ×
		Apartment type factories	◆◇ ×	×	◆ ×
		Overseas industrial park	◆ ×	×	×
		Start-up business incubators	◆◇△ ×	◇	◆ ×
Venture business park		◆◇ ×	×	×	
Management	Management diagnosis and advice	◆◇ ×	◆	◆◇	
	Start-up business advice	◆ ×	◆	◆◇ ×	
	University business club Assistance	◆◇ ×	◆	×	
Consulting	Technology	Technology guidance	◆◇ ×	◆	◆◇
		Test, analysis, inspection and Appraisal	◆ ×	◆ ×	×
		ISO certification assistance	◆◇ ×	×	×
		International standard certification assistance	◆◇ ×	◆	×
		Folkcraft articles quality appraisal	×	◆	×
		Technology competitiveness evaluation business	×	◆	×
	Marketing	SMI exhibitions & shops	◆ △ ×	◆◇ ×	×
		Internet homepage services	◆◇ ×	◆ ×	◆
		Joint brand names development	◆ ×	×	×
		Opening up overseas markets	◆ △	×	×
		Promotion of conversion of SMEs to exporters	△	×	×
		Overseas trade office operation	◆ ×	×	×
Information	DB	Idle facilities and equipment Transaction assistance	◆◇ ×	◆	×
		Linked-production assistance	×	×	◆
Cooperation & Brokering	Industry, University, Research	RRC	◆ △ ×	×	×
		TIC	△ ×	×	×
		Sanhakyeon consortium	◇	◇	×
		Industrial design assistance	◆ △ ×	×	×
Networking	Community & Exchange	Venture business events	◆◇ ×	◆ ×	◆◇ ×
		Support for communication & exchange among different businesses	◆◇ ×	×	◆
-	-	Regionally specialized industry Assistance*	◆◇	◆◇ ×	×

Notes: ◆ where the local SME-support agency in question independently assists and has no contact with other local SME-support agencies.
 ◇ where the local SME-support agency in question assists and contacts other local SME-support agencies.
 △ where the local SME-support agency in question assists and contacts central government agencies or public organizations other than other local SME-support agencies.
 × where the local SME-support agency in question does not assist
 * where it is separately classified due to almost all kinds of enterprise-support services being provided
 SMBA (Small Medium Business Administration); and SBC (Small Business Corporation)

Source: adopted from KIET (1999)'s survey.

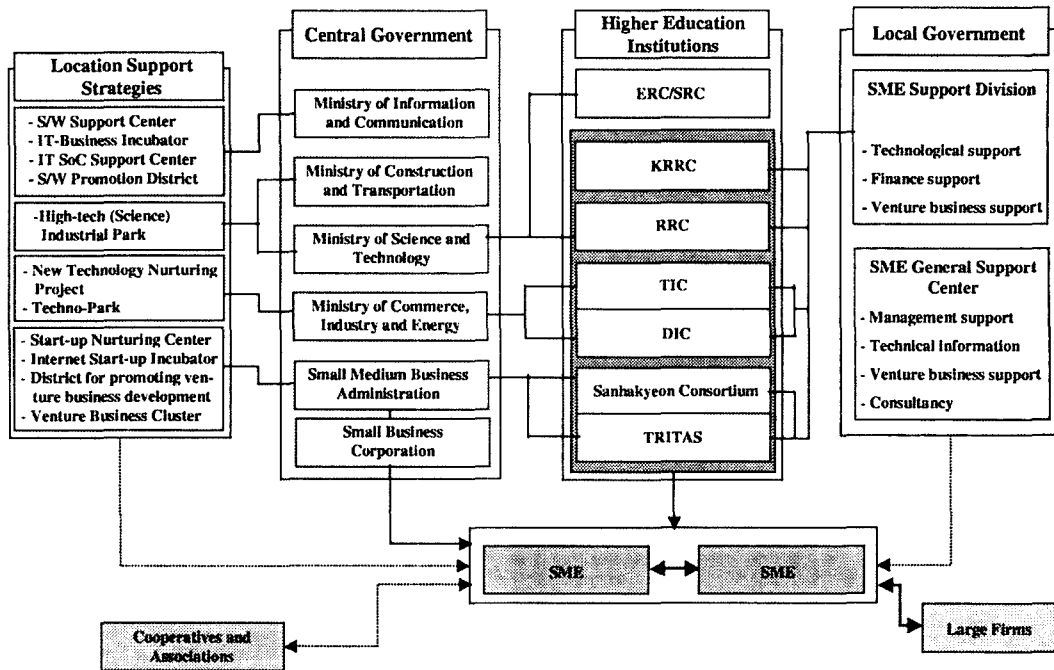


Figure 2. Support Structure of Public (or non-profit) Enterprise Support Services in Korea

programs for the support of science and technology through industry and academic links. Gyeonggi Province especially has launched the Kyeonggi Regional Research Center (KRRC). To support effectively these technological support programs, each province is running a SME General Support Center through initial supports from the Small and Medium Business Administration.

(2) Characteristics of enterprise-support services network

The Korean government has attempted to enhance SMEs' competitiveness and regional innovation potentials through providing a variety of enterprise-support services, which may have contributed to creating redistribution effects from zero customers to non-zero customers and to avoiding the market failure of underproduction of specialized services through encouraging the new market of business services, as earlier mentioned. Some characteristics of enterprise-support services system in

Korea can be given. First of all, enterprise-support services are provided across the whole value chain including finance, start-up, technical assistance, information and referrals service, consultancy, support for seminars and forums being held, etc.

Secondly, the Korean enterprise-support services network can be characterized as a decentralized support system, where services are provided by the network of local branches of the central government's ministries and individual industrial support agencies. In terms of regions and firms, some functions are excessively redundant, while others are not, which therefore leads to the creation of inefficiencies. Furthermore, the lack of real correspondence between the central government's ministries and individual support agencies could make firms' searching costs surprisingly high, and thus fewer benefits are gained. For example, the Ministry of Science and Technology (MOST) and the Ministry of Commerce, Industry and Energy (MOCIE) have respectively supported the growth and management

of the Science Research Center (SRC) and the Engineering Research Center (ERC) and Techno-Park projects for the formation of networks among industry, academy and government research institutes and the encouragement of technology transfer and cooperation in the provision of support services. These projects are redundant in terms of functions being performed and support contents being provided.

Thirdly, enterprise-support service systems have been mainly based upon financial policy instruments, whilst support systems for technological development and diffusion of innovation potentials have been established in a relatively weak form. For example, the projects of Techno-Park, Technology Innovation Center (TIC), etc. have focused upon the spatial clustering of innovative resources such as universities, research centers and government research institutes, rather, the development of support programs for functional linkages among them have been comparatively neglected. Also, in effect, these projects have paid most attention to utilizing and upgrading physical equipment and facilities for research and development. It seems difficult to expect to have real positive effects of technical assistance on firms.

Fourthly, although a variety of enterprise-support services are provided, marketing, management consulting, legal and accounting services and so on, whose demands are recently increasing, are formally provided because much attention has been given to the transfer of technology and the provision of business premises and sites as already mentioned.

Finally, no real services have been provided that meet the needs of firms. Real customers would need comprehensive and one-stop services provided through the construction of platforms including technical assistance, training, financing, marketing and so on, with each service being supplied by the network of individual enterprise support service agencies.

In sum, one of the major problems of the enterprise-support services network in Korea is that enterprise-support services encouraging communi-

cations and exchanges among different business fields and inter-firm linkages in similar business areas, have not been actually provided to firms. This might limit upgrading the bases of regional innovation potentials.

(3) Provision of private enterprise-support services (producer services)

As mentioned above, most of the producer services providers are located in the capital region (see Figure 3). Producer services do not supply only information but act as intermediaries as well. A great deal of information should be collected and interpreted in a series of production systems. Large metropolitan areas tend to be well equipped with performing these functions due to the formation of rich general supply conditions such as physical and social infrastructure, telecommunications, human resources and so on.

There is no need to geographically match the supply of and demand for producer services and these do not depend upon the level of economic activities in a region. Moreover, since these services are not produced by the information provided but by the expertise and knowledge accumulated mostly around large metropolitan areas well equipped with a network of specialized knowledge, they are exportable to other areas. Thus, it is likely a spatial mismatch between suppliers and demanders may occur.

As shown in Figure 3, the providers of producer services are severely concentrated especially in the capital region and large metropolitan areas. Seoul is spectacularly specialized in KSIC: there are 72 (computer and related activities) and 74 (professional, scientific and technical services), which are cores of business services. These services specifically include information processing, software development, marketing, management consulting, engineering, legal and accounting services and advertising and so on.

However, some services such as finance, insurance and real estate may be relatively more specialized for the regions other than the capital region in

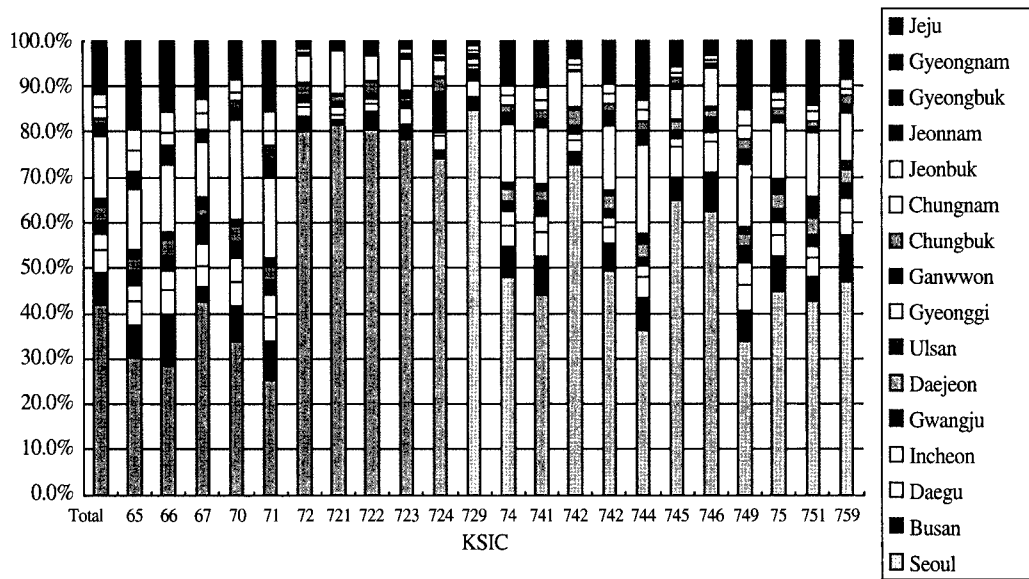


Figure 3. Spatial Distribution of Producer Services as % of Employees in 1999

Notes: 65 (Financial institutions, except insurance and pension funding), 66 (Insurance and pension funding, except compulsory social security), 67 (Activities auxiliary to financial intermediation), 70 (Real estate activities), 71 (Renting of machinery and equipment without operator and of personal and household goods), 72 (Computer and related activities), 721 (Computer system design and consulting), 722 (Software consulting and supply), 723 (Data processing and computer facilities management services), 724 (Database activities and on-line information provision services), 729 (Other computer activities), 74 (Professional, scientific and technical services), 741 (Legal, accounting and tax preparation services), 742 (Market research and management consulting services), 743 (Architectural, engineering services), 744 (Scientific and technical services), 745 (Advertising), 746 (Specialized design services), 749 (Other professional, scientific and technical services), 75 (Business support services), 751 (Facilities support and employment services) and 759(Other business support services).

terms of the number of employees (see Figure 3) because these services are not only part of specialized producer services but there are also industries in which generic or standardized and specialized or dedicated services are created and circulated at the same time. Generally, the foundation of specialized knowledge-based services are much more vulnerable in other areas of the capital region. Thus, there is the need for the public sector to supplement or complement the basis of producer services in the rest of the capital region in order to enhance regional innovation potentials. As earlier implied, this may avoid market failure or underproduction, and hence the market creation of business services through linking real demanders to specialized service providers.

3. An Empirical Analysis of Demand for and Supply of Enterprise-support Services

1) Methodology

The results presented in this paper are based upon the findings of on site-visit and mail-in survey of companies in the Information and Communication Technology (ICT) industry in Daejeon, the electronics industry in Gumi and the software industry in the Seocho and Gangnam-Gu area of Seoul, which could contrast the characteristics of old and new industries, during the period of September through October 2001¹⁾. Given the need to produce a questionnaire that was relevant to the issues faced by the compa-

nies, which could be readily understood by the respondents, and appreciative of the fact that some question areas were of a sensitive nature, in-depth interviews were conducted with some companies as a means of obtaining supplemental information for the survey. A small pilot survey was also conducted prior to posting the final questionnaire.

Three industrial clusters were selected. The Seoul software industry valley refers to as the agglomeration of software venture business start-ups around Gangnam-gu and Seocho-gu in Seoul, which has been naturally created in the 1990s. Since 1990s the Daejeon ICT cluster has been produced through the process of spin-off from a number of government-sponsored research institutes in the Daeduk Research Park (see Jeong and Park, 1999), whilst the Gumi electronics industry cluster was created by the logic of a spatial division of labor based upon a separation between execution and implementation during the 1970-80s. However, it has recently evolved into more integrated region than before.

There were 345 companies for the survey from Daejeon, 249 from Gumi and 1,673 from the Seocho and Gangnam-Gu area of Seoul (thereafter Seoul). A total of 2,267 questionnaires were released. 137 for Daejeon, 58 for Gumi, and 53 for the Seoul were returned. The response rate was 39.7%, 23.3% and 3.2% respectively. Given the limited absolute number of survey returns, where cross-tabulations were conducted, the majority of associations identified could not be tested for statistical significance. Furthermore, research will therefore be required before certain inferences can be fully verified. It should also be noted that as some questions in the survey deal with respondents' perceptions of the work that they themselves do, the possibility of response bias cannot be eliminated entirely and this should be recognized when reviewing the results.

For the majority of questions, respondents were asked to use a five point Likert scale to indicate the extent to which they agreed with a range of statements regarding the demand for and supply of

enterprise-support services issues identified earlier. Companies were also asked to rate the importance of a number of factors of possible significance to the provision of enterprise-support services. In addition, they were required to estimate the extent of their business transactions undertaken according to the scale of regions. A range of factual questions was asked in order to facilitate the categorization of companies on the basis of stage of growth, size (turnover and employees), location, major products, spatial business organization and so on.

2) Results and discussion

(1) Some characteristics of production systems

The results of the survey are considered in relation to key areas of the nature of production systems and the status quo of demand for and supply of the enterprise-support services provided by public (or quasi-public) agencies. The industrial clusters surveyed in Seoul and Daejeon mainly consist of small and medium venture start-ups. Thus, in terms of the stage of a firm's growth, they have entered into the 'stage of product development after start-up' or into the stage of product production and marketing (see Table 3). Although the Seoul software industry cluster seems to be more mature than Daejeon's ICT valley, both clusters are those that represent some features of new industries such as ICT and software. On the contrary, Gumi is typical of the mature cluster whose electronics industry has entered into the standardized stage in terms of its product life cycle.

The business transaction pattern of production systems (clusters) shows different aspects according to the stage of a firm's growth. Respondents in the Seoul and Daejeon clusters regard the most important business transaction as 'R&D and technology transfer', followed by 'selling'. The latter respectively accounts for 39.6% and 42.3%, while the former respectively amounts to 49.1% and 51.1%. However, the most important business transaction in Gumi cluster is the transaction 'selling', which accounts for 67.2%, accompanied by the transaction 'R&D and technology trans-

Table 3. Company's growth stages compared: Seoul and Daejeon (%)

Growth stages	Seoul	Daejeon
Product development after start-up	8 (15.1)	51 (37.2)
Production and marketing	23 (43.4)	54 (39.4)
Market share secured	11 (20.8)	12 (8.8)
Market expansion and follow-up product development	11 (20.8)	18 (13.1)
Others (e.g. preparatory start-up)	0 (0.0)	2 (1.5)
No. of available respondents	53 (100.0)	137 (100.0)

Table 4. The most important business transaction compared (%)

Categories	Seoul	Daejeon	Gumi
Purchasing (suppliers)	3 (5.7)	4 (2.9)	3 (5.2)
Selling (clients)	21 (39.6)	58 (42.3)	39 (67.2)
Financial services	1 (1.9)	3 (2.2)	4 (6.9)
Legal, accounting, consulting services	2 (3.8)	2 (1.5)	1 (1.7)
R&D and technology transfer	26 (49.1)	70 (51.1)	11 (19.0)
No. of available respondents	53 (100.0)	137 (100.0)	58 (100.0)

Table 5. Spatial linkages of business transactions compared (%) as of December 2000

Categories	Seoul		Daejeon		Gumi	
	within	outside	within	outside	within	Outside
Purchasing (suppliers)	50.1	49.9	28.2	71.8	35.1	64.9
Selling (clients)	46.8	53.2	25.6	74.4	56.9	43.1
Financial services	79.4	20.6	52.7	47.3	53.4	46.6
Legal, accounting, consulting services	60.9	39.1	54.8	45.2	59.4	40.6
R&D	77.8	22.2	39.4	60.6	68.7	31.3

Notes: the term 'within Seoul' indicates the Seocho and Gangnam-Gu area of Seoul and the terms 'within in Daejeon and within in Gumi' respectively refer to as in the vicinity of Daejeon-city and Gumi-city, while the term 'outside' refers other areas around the nation and or overseas.

fer' (19.2%). This implies that the electronics industry in Gumi has entered into the mature stage in its product life cycle as mentioned above, and hence the sale of standardized products could be regarded as the most important business activity.

(2) Demand for and supply of the enterprise-support services

As suggested in Table 6, demands for support programs necessary for a firm's competitiveness revealed a few different patterns with respect to industrial characteristics and regional differences. For the Seoul and Daejeon areas, most companies

desired finance and marketing-related services, followed respectively by one-stop-services for administrative registration and recruiting services for human capital resources. The needs of financial services reflect that the inflow of capital is not as easily channeled than in the past due to a recently widespread recognition of venture start-ups as part of a bubble economy and the coming of an economic recession. Since small and medium venture companies with less than 50 employees do not generally reach the minimum efficient scale when recruiting specialized staff members involved with business planning, marketing and so on, it would be efficient

and desirable to use external resources rather than internalizing the necessary resources. In this regard, small and medium venture companies with less than 50 employees substantially demand the support measures regarding management consulting, marketing services, etc.

In Gumi's case, marketing services is clearly demanded here, accompanied respectively by training and human resource recruiting services, one-stop-services for registration and technology transfer services. Because respondents of the Gumi electronics arena are almost client-oriented subcontracting firms to large corporations or specialized parts suppliers, it is necessary for marketing services to expand beyond existing markets or to be independent from the umbrella of existing large companies. Furthermore, the respondent companies recognize the need of restructuring in that they demand technology transfer and human capital resources recruiting services. They also want one-stop services for

registration. This reflects the reality of the regional economy, which is much less equipped with internal and external resources.

In this way, the respondents companies demand different support services according to regional industrial structure and a firm's growth stage. Since the Seoul and Daejeon areas have already been relatively well equipped with an enterprise-support services system, they recognize in effect the need of more specialized business consulting and marketing services. Also, the intensities of innovation are very high and a number of public and private research institutes and universities have already been concentrated in the two regions. Thus, this makes the demand for technology transfer services less than desirable. On the other hand, Gumi's region regards technology transfer services and general one-stop-services for registration as more important than the above two clusters respectively because of the need of renovating the mature industry and the absence

Table 6. Demands for enterprise-support services compared (%)

Types of support	Seoul				Daejeon				Gumi			
	1st	2nd	3rd	W ¹⁾	1st	2nd	3rd	W ¹⁾	1st	2nd	3rd	W ¹⁾
One-stop-shop services incl. start-up, general management, consulting, marketing, etc.	20.8	9.4	7.8	14.9	16.2	5.2	6.7	11.0	17.2	14.0	5.3	14.2
Legal, accounting, tax, translation, advertising services, etc.	0.0	9.4	15.7	5.7	2.9	8.1	14.2	6.5	1.7	3.5	7.0	3.2
Marketing, distribution and export support	37.7	22.6	5.9	27.5	33.1	18.5	11.2	24.6	31.0	21.1	8.8	24.1
Joint-use technological facilities and equipment	1.9	7.5	3.9	4.1	4.4	6.7	7.5	5.7	8.6	1.8	8.8	6.4
Technology transfer from higher education institutions and public research institutes	3.8	7.5	2.0	4.7	4.4	8.9	9.7	6.8	15.5	10.5	7.0	12.5
Provision of facilities (e.g. meeting and office facilities, video-conferencing, etc.)	1.9	0.0	3.9	1.6	0.7	3.0	5.2	2.2	1.7	0.0	3.5	1.4
Formation of close business cooperation within the area	0.0	13.2	7.8	5.7	4.4	11.9	9.7	7.8	3.4	14.0	7.0	7.5
Finance incl. venture capital funds, loans, loan guarantees, etc.	22.6	17.0	25.5	21.3	25.0	23.7	13.4	22.7	12.1	7.0	14.0	10.7
One-stop-services for administrative registration and documentation	1.9	1.9	7.8	2.8	0.0	4.4	5.2	2.3	1.7	5.3	12.3	4.6
Training and education of experts in information technology; IT, etc.)	9.4	11.3	19.6	11.7	8.8	9.6	17.2	10.5	6.9	22.8	26.3	15.4
No. of available respondents	53	53	51	-	136	135	134	-	58	57	57	-

Note: 1) W indicates a percentage obtained from giving respective weights of 3, 2, 1 points to the 1st, 2nd, 3rd ranking.

of a systematic enterprise-support system.

With regard to the provision of enterprise-support services, it contributes differently to business activities in terms of the providers of services and regions served (see Table 7). The Small and Medium Business Administration (SMBA) plays a pivotal role in providing real services in that it gains over an average of 3 points out of the five point Likert scale in the three industrial arenas surveyed. For the Seoul area, business associations and local financial institutions play an important role in the firm's assistance. It can be assumed that the majority of business support services are implemented by the private sector and not the public sector.

In Daejeon's case, business incubators contributed more positively to business activities than any other service providers. The business incubators from the Korea Advanced Institute of Science and Technology (KAIST) and government-sponsored research institutes provide a rich environment for a new start-up. They not only provide hard infrastructure such as business premises or sites needed for venture start-up and the utilization and sharing of

physical equipment and facilities but they also deliver soft support services related to business counseling, marketing, human resources and training, and so on. Moreover, the Daejeon metropolitan local government has focused upon the nurturing of venture businesses for regional industrial development.

On the other hand, Gumi represents different aspects compared with the above two cases. Local financial institutions, local government and local chambers of industry and commerce have a critical role in the provision of business support services because Gumi has closer relationships with local economies than the above two regions due to a relatively long history of industrialization. In particular, the role of financial institutions is very important in the regional economic environment where it is not easy for SMEs to raise the funds necessary for their business operation.

Technology-assistance agencies which have recently established the enhancement of networking among industry, academy and research (public institute), including Techno-Park, TIC, RRC, ERC, SRC, and so on, did not provide real services to compa-

Table 7. Comparison of contributions of enterprise-support service agencies to business operation (%)

Agencies	Seoul							Daejeon							Gumi						
	0	1	2	3	4	5	A ¹⁾	0	1	2	3	4	5	A ¹⁾	0	1	2	3	4	5	A ¹⁾
Central government (e.g.: SMBA)	26.4	7.5	15.1	18.9	30.2	1.9	3.1	10.2	5.8	5.1	19.7	39.4	19.7	3.7	50.0	1.7	12.1	10.3	20.7	5.2	3.3
Local government	41.5	11.3	20.8	18.9	7.5	0.0	2.4	13.1	3.6	10.2	24.8	34.3	13.9	3.5	29.3	1.7	8.6	19.0	29.3	12.1	3.6
Technology-assistance agencies ²⁾	35.8	7.5	18.9	24.5	11.3	1.9	2.7	25.5	8.8	16.1	35.0	10.9	3.6	2.8	56.9	5.2	8.6	19.0	10.3	0.0	2.8
Start-up incubators	39.6	15.1	22.6	15.1	3.8	3.8	2.3	14.6	4.4	5.1	14.6	32.8	28.5	3.9	-	-	-	-	-	-	-
Chamber of commerce & industry	34.0	9.4	24.5	20.8	11.3	0.0	2.5	19.7	8.8	19.0	35.0	15.3	2.2	2.8	24.1	6.9	5.2	19.0	36.2	8.6	3.5
Business associations	22.6	7.5	13.2	26.4	26.4	3.8	3.1	12.4	4.4	9.5	37.2	25.5	10.9	3.3	-	-	-	-	-	-	-
Local financial Institutions	22.6	9.4	9.4	28.3	22.6	7.5	3.1	8.8	7.3	6.6	27.0	27.0	41.6	3.4	17.2	3.4	5.2	15.5	41.4	17.2	3.8
Local business Networks	18.9	5.7	11.3	28.3	32.1	3.8	3.2	17.5	6.6	10.2	32.1	27.0	6.6	3.2	-	-	-	-	-	-	-
Others	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	93.1	1.7	3.4	0.0	1.7	0.0	2.3

Notes: 1) A refers to average scale; 2) they include Techno-Park (TP), TIC, RRC, ERC & SRC, etc. assisted and operated by governmental or public agencies; and 3) 0 means no relationship, 1 very insubstantial, 2 insubstantial, 3 neither, 4 substantial and 5 very substantial.

nies in the three industrial clusters surveyed, probably due to their very recent establishment. Although it is assumed that universities will basically act as pipelines for the transfer of technology, it is needed to recognize the likelihood that the role of universities could be less played than expected (OECD, 1995). The research and development activities of universities tend to be much more focused in terms of basic research fields. It would be hard to commercialize the results of research immediately. Moreover, universities are more inclined to fall behind private companies in terms of information interpretation and management system for undertaking and tracing technological development suited for commercial needs.

4. Conclusions and Policy Implications

From the above empirical study, it can be concluded that the demand for and supply of enterprise-support services are differentiated by the nature of an industry, the characteristics of a region, and the growth stage of a firm. For Seoul, there is the need for more specialized business services to be provided rather than the need to enhance the general supply condition of enterprise-support services. For example, the provision of marketing and business consulting services should meet the real needs of companies. On the other hand, since Daejeon and Gumi have a weak supply base of enterprise-support services, the provision of enterprise-support services in general should be established by the public sector. Also, there is the need to supply these services differentially with regard to regional industrial structure. Since Daejeon has a strong base of technological development, it is necessary to consolidate and improve the similar, but redundant services rather than amplifying technological transfer services. Specialized business services such as marketing should be more developed and broadened.

However, it is required for Gumi to formulate the basis of technological development and to cultivate human resources for the renovating and restructuring of a mature industry.

Some policy implications can be drawn from the discussion made above. In order to enhance enterprise-support services efficiently, the decentralized and supply-oriented provision of these services should be transformed into an integrated and demand-oriented provision of services. To do so, the basic policy lines for the formation of enterprise-support services network are created as follows: diversification, professionalization and differentiation. In relation to the diversification of enterprise-support services system, a variety of real business-support services should be provided including not only financial and technological transfer services but also other specialized business services such as marketing, business consulting, and promotion services for cooperation, brokering and networking. The professionalization of an enterprise-support service system is concerned with both encouraging the participation of private specialized business service providers and expanding public specialized enterprise-support service suppliers. The differentiation of the enterprise-support service system means that these services should be provided according to industrial characteristics, regional differences, the firm's growth stage and so on. Following these policy directions, it would be optimal to construct an enterprise-support services system by stage, based upon the needs of targeted industries. Also, the public provision of enterprise-support services should be differentially made by region to match the vision for regional industrial development and the innovation characteristics of the strategic industries chosen. The public provision of enterprise-support services should to some extent (probably up to 50% in some cases of OECD countries) be charged to avoid moral hazards and reverse selections and to provide more specialized services preventing any chance of running into any inconsistencies.

Note

- 1) For Gumi and Daejeon, the survey was conducted by Dr. Kwon Yeong Sub and Kim Dong Ju of the Korea Research Institute for Human Settlements (KRIHS), Dr. Hwang Joo Sung of the Korea Information Society Development Institute (KISDI) and Dr. Lee Jeong Hyop of Science and Technology Policy Institute (STPI). Here, we would like to express our gratitude for providing the survey results for our research. For Seoul, we at KIET conducted the survey.

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