

## RESOURCE MOBILIZATION AND BUSINESS INCUBATION: THE CASE OF KOREAN INCUBATORS\*

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*The rapid expansion of business incubators in Korea is one of the most important phenomena affecting the high-tech industries in Korea. This paper presents the current conditions of Korean incubators and proposes what factors are important for their continual development. First, we present how rapidly this new organizational model, business incubation, expanded in Korea after the IMF bailout crisis. Second, we explore factors that lead these incubators to perform better. We emphasize that better qualified technical, managerial, and administrative support of incubators are important success factors. However, we also argue that better networked incubators perform better. By better networked incubators, we mean the incubators that can provide the incubatees (start-ups) with effective internal networking (e.g., alliance among incubatees) and sufficient external networking as well (e.g., technical support from outside experts, professional assistance from outside consultants, support from the central and local governments, etc.). We agree to the earlier literature that encouraging networking among incubatees is an important success factor for incubators. In this paper, we also suggest that external networking and outsourcing are significant components in the case of Korea where most of incubators are not self-sufficient in providing services and support to incubatees.*

**Key Words:** *Incubation, Inter-firm network, Resource mobilization*

### BUSINESS INCUBATION IN THE GLOBAL AND LOCAL CONTEXT

The rapid expansion of business incubators in Korea is one of the most important phenomena affecting the high-tech industries in Korea. After the 1997 financial crisis, Korean economy in general and the high-tech industry in particular attempt to shift its business paradigm. The "economy of scale" models of large businesses have been seriously criticized and given way to

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the entrepreneurial models of small firms. From the perspective of employees, capital markets, and even the government, the emphasis has shifted from the old economy, dominated by big business groups, to the new economy, led by startups and entrepreneurs. This shift was evident in the establishment of a new capital market, the KOSDAQ, a market modeled after the NASDAQ and devised for technology and small startup firms. The emergence of venture capital industry represented a diffusion of the Silicon Valley model to Korea. This shift has created a large group of entrepreneurs who establish their own firms and pursue their ideas rather than being employees of Chaebol companies. In addition, this change has produced the proliferation of a new type of organizations, business incubators that provide physical workspace as well as technical, legal, managerial, and financial support to new startup companies. This study explores the history and present state of the Korean business incubating industry and examines factors that lead incubators to better perform.

Business incubator is a broad umbrella term referring to any organization that provides physical workspace, management assistance, access to financing, and technical and other supporting services to young firms and helps them survive and grow during the startup stage. The concept of business incubation, which emerged during the 1970's in the US and Europe, is exploding in popularity all over the world as a modern business model. According to the National Business Incubation Association (NBIA) estimates, there were approximately 15 incubators in North America as of 1980, but today 600 incubators are located in North America alone. There are approximately 2,500 incubators worldwide (NBIA 1997; Lalkaka and Schaffer, 1998).<sup>1</sup>

Nowadays, we can easily find this concept and business activity in developing economies and non-Western countries. There are close to 100 incubators in the People's Republic of China. Also, in the Ukraine and Poland incubators are being developed in an attempt to create an entrepreneurial economy. The Japanese government recently announced a new initiative aimed at encouraging such an entrepreneurial culture. In the Republic of Korea, the incubation industry is growing fast with the proliferation of e-

<sup>1</sup> This concept also rapidly expands into various industries. The earliest incubation programs were focused on a variety of technology companies or on a combination of light industrial, technology and service firms — today referred to as general purpose incubators. However, in more recent years, new incubators have been developed targeting industries such as food processing, medical technologies, space and ceramics technologies, and wood-working. Incubators have even been created for arts and crafts and for retail firms. Programs have also been targeted to the needs of women and minorities, environmental endeavors, and telecommunications.

businesses and the boom of the venture-funded economy. As of March 2006 there are 274 business incubators in Korea which are registered in and sponsored by a governmental unit, Small and Medium Business Administration.

In the case of Korea, the number of incubators grew dramatically following the 1997 IMF financial bailout crisis. The central government initiated the incubating programs and provided subsidies to universities, research institutes, and local governments who wanted to establish business incubators. In addition to the support of the Small and Medium Business Administration, for instance, the Ministry of Information and Communication (MIC) has highlighted its supporting plans for start-up companies through their Software Support Centers and Information/Telecommunication Start-up Support Centers. The MIC is also operating high-tech business incubators in the Silicon Valley. In Korea, Business incubators have proliferated after the financial crisis as a means of invigorating the economy through venture-funded companies and re-organizing the national industrial structure to a high-tech oriented one, which has been led and supported by the central government.

Despite the increasing number of business incubators, many problems in the operation of those incubators have surfaced due to the lack of training of capable incubation managers and staffs, poorly structured incubator post-management and networking, and failure to adapt to the local business environments. This paper presents the current conditions of Korean incubators and proposes factors that are important for their continual development. In the following sections we briefly sketch the historical development and the current state of business incubation in Korea.

## DEVELOPMENT OF BUSINESS INCUBATION IN KOREA

The origins of business incubation in Korea can be traced to the early 1990's. The practice, however, did not gain widespread momentum until 1998 when the Small and Medium Business Administration (SMBA) and several other governmental agencies started to finance business incubators and placed entrepreneurial companies in those incubators. The concept of business incubation was first introduced in Korea in 1991 when the Production Technology Research Center was established and operated "Technology Incubators," the predecessor of today's Technology Business Incubators (TBI). This was a benchmarking of the NASA technology transfer project. Support to entrepreneurs came in the form of a three-step process: pre-foundation consulting, supervision of the start-up stage, and production of a test-product - from technology development to commercial-

ization. Such support, however, was "out-of-wall." The center did not provide physical workspace, managerial skills, and access to financing. Rather, it narrowly focused on support with technological development.

The business incubation model of companies physically being located within the incubator was set up in 1993 with the establishment of the Youngdong Business Incubation Center. This concept of in-house business incubation was even more elaborated and developed after the Small Business Corporations (SBC) started designating and supporting incubators. Currently the SBC operates 9 incubators, including the Ansan Business Incubation Center. In 1994, Korea Advanced Institute for Science and Technology (KAIST) started an incubating center as a predecessor of their current new-technology support arm.

Business incubation in Korea only came into full swing following the 1997 IMF bailout crisis. Prompted by the IMF bailout, light was shed on the necessity to restructuring the economy from a traditional industry-based, large scale economy to a knowledge-based, small scale one. In addition, unemployment issue was raised as a serious must-solve problem at the time. Accordingly, from 1998 the Small and Medium Business Administration (SMBA) and the Ministry of Information and Communication (MIC) kick-started support operations on business incubation projects as a measure of consolidating the foundation of new technology-based industries, establishing a knowledge-based economy, and creating new jobs.

On a parallel front, as the decentralization and regionalization of economic power became prevalent, local governments began a race to specialize and develop their local economies, and this turned their attention to business incubation. Nowadays, the number of business incubation projects with private sector involvement is also increasing. Technology in the telecommunications and biotechnology sectors is advancing at an amazing pace and so is the number of new companies in this area. Companies in the private sector are positioning themselves to gain the edge in these sectors by operating business incubators of their own in order to obtain cutting-edge technologies or establish partnerships with start-ups in such areas.

## PRESENT STATE OF BUSINESS INCUBATION IN KOREA

In Korea, central government-led business incubation is the most prevalent. Among such incubation projects, SMBA's designation and support of business incubators and MIC's Software Support Centers and Information/Telecommunications Start-up Support Centers take up the

largest piece of the governmental incubation pie. Public sector-led business incubation operations are also run by the Ministry of Commerce Industry and Energy (MOCIE)'s TBI arm, the Ministry of Science and Technology's new-technology business incubation support arm, Ministry of Culture and Tourism's Culture Industry Support Centers, and the direct or indirect involvement of local governments. Business incubation in the private sector has also gained momentum recently, and such projects are actively being pursued.

In this study, we focus on the business incubators designated by SMBA as of January 2002. SMBA's involvement in business incubation started with Small Business Corporation's (SBC) Ansan Business Incubation Center in 1992. Extensive involvement in business incubation, however, started in 1998. Until 1997 the SMBA designated and supported only 12 business incubators. The number of incubators increased to 30 by 1998. In 1999 and 2000, 89 and 96 were added respectively. As of January 2002 there were 259 business incubators that are, on average, 23 months old (see Figure 1).

The Small Medium Business Administration designates host organizations (e.g., universities) and supports them to establish incubators in the form of direct financial aid for construction, expansion, renovations, and facilities costs. From 2001, aid for operating costs is also provided to the incubators classified as Distinguished Business Incubators. In addition, the SMBA is focusing on enhancing the incubation capabilities of the centers through indirect support. Indirect support includes encouraging networks

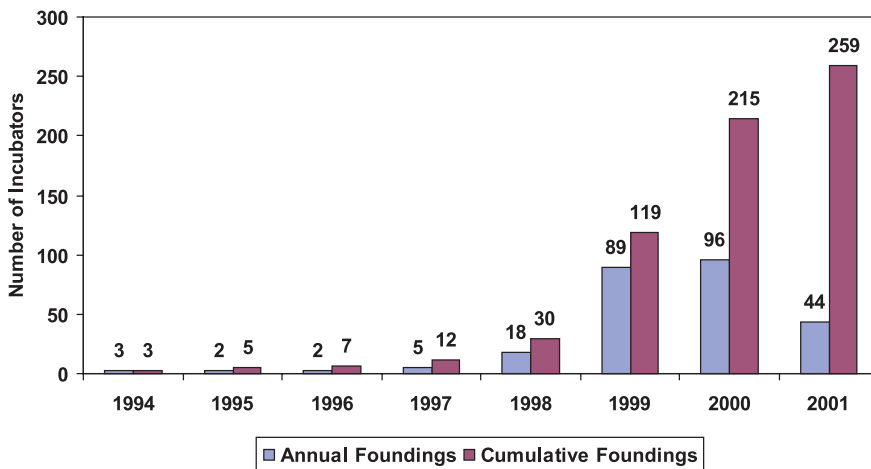


FIGURE 1. GROWTH IN NUMBER OF INCUBATORS

among incubators through the formation of the Korea Business Incubation Association, training incubation managers, SMBA managers supporting incubatees through site visits, and providing incubatees with professional support through SMBA's expert pools in various fields.

There are mainly two different types of business incubators: Business Incubator (BI) for incubation operations open to all industry-types and Internet Business Incubator (IBI) for operations targeting Internet related incubatees. As of January 2002 there are 27 Internet business incubators and 232 general business incubators. The majority of the incubators (84.2%) are hosted by universities, and the rest of them (15.8%) are run by private companies, local governments, research institutes, and Small Business Corporations (SBC). The incubators are also unevenly but widely distributed all over the country. The geographical breakdown is: 75 incubators in Seoul and Kyunggi areas, 41 in Busan/Kyungnam/Ulsan, 37 in Daejon/Chungnam, 31 in Daegu/Kyungbuk, 25 in Kwangu/Chonnam, 15 in Chonbuk, 13 in Kangwon, 13 in Chungbuk, and 2 in Cheju.

Of the incubators, 79.9 % have less than 20 available incubating rooms to rent out to startup companies. Only 8.9 % of the incubators have more than 30 rooms. The 259 incubators have an average of 17.26 (a median of 15) rooms. In total, the 259 incubators possess 4,471 incubating rooms. Most of incubators (89.2%) report that they nurture less than 20 incubatees (tenant startup companies). 10.8 % of incubators report that they house and provide services for more than 21 incubatees. As of January 2002 the 259 incubators take care of an average of 13.15 (a median of 12) incubatees. On average, every incubator has 3 to 4 unoccupied rooms. In total, the 259 incubators are nurturing 3,045 incubatees and leave 1,426 rooms unoccupied. By incubatees we mean startup companies that are located in and nurtured by an incubator.

In terms of the length of incubation, 169 incubators (65 %) provide 2 year hatching (incubation) programs and 90 incubators (35 %) offer 1 year programs. In most cases, if the tenant companies want, incubators extend one more year of hatching time. By hatching time we mean the period (the number of months or years) an incubatee spends in the incubator.

The incubators also report an average of 5.4 (a median of 2) graduates since they have founded. However, many incubators (36%), especially young ones, have not produced a graduate. 84 % of incubators report that they have graduated less than 10 companies. Only 16 % of the 259 incubators report that they have produced 11 or more graduates. In total, the 259 incubators have graduated 1,398 companies. Among them, 7 companies have made initial public offerings (IPO) by 2002. By graduates we mean

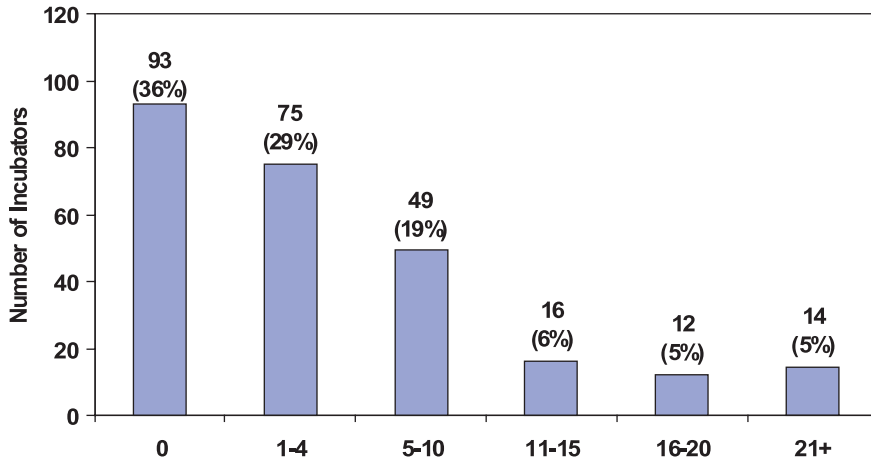


FIGURE. 2. NUMBER OF GRADUATES

incubatees that have left the incubators and no longer receive the services from the incubators. This indicator (the number of graduates) will be used as our dependent variable to measure the performance of incubators in the later section of this paper.

The 259 Korean incubators employ a median of 3 people (people working for the incubators, not the incubatees) that include full-time managers and administrators. 78 % of incubators have fewer than 4 full time employees. These figures clearly show that most incubators in Korea do not employ enough people. According to Hansen et al (2000) the 169 incubators worldwide in their survey sample employed a median of 15 people. In this respect, it is crucial for the incubators in Korea to find qualified partners and experts to outsource their services.

Throughout the historical background of Korean incubators, we find how rapidly this new organization model, business incubation, has expanded in Korea since the IMF bailout crisis. In the following section, we explore what factors lead these incubators to perform better.

## FEATURES OF SUCCESSFUL INCUBATORS

Several earlier studies (Campbell, 1989; Latona & LeHere, 1989; Allen & McCluskey, 1990; Rice & Matthews, 1995; Martin, 1997; OECD, 1997; Hansen, Chesbrough, Nohria, & Sull, 2000; Hansen, Nohria & Berger, 2000) identify the features of successful incubation programs. Examining either a

single case or a sample of incubators, these studies explore various issues such as the identity of the partners, the range of services offered, the networks in place, the mix of companies, and the skills of the management team.

Campbell (1989) identifies low costs of developing and operating incubators as well as quality management of facilities as features contributing to the effectiveness of incubators. Latona and LeHere (1989) isolate several success factors including an aggressive entrepreneurial outreach program, a small business assistance center, access to sources of capital, and incubator facilities. Allen and McCluskey (1990) find that age and size of incubators are important determinants of successful incubation programs indicated with the number of jobs created and firms graduated. Rice and Matthews (1995) highlighted effective intervention as a critical feature. Martin (1997) identifies flexible space, clear entry criteria, a maximum length of stay, management by a business development agency, and clear priority placed on networking. However, in the same year the OECD (1997) isolates a different series of factors: the objectives and mission, an entrepreneurial manager, focus on cluster based technologies, tenant selection, local and international linkages, and diversified sources of finance.

In later studies, the ability to facilitate networking emerges as a key differentiating factor (Hansen, Chesbrough, Nohria, & Sull, 2000; Hansen, Nohria, & Berger, 2000). Hansen and the colleagues argue that one type of incubator, called a networked incubator, represents a new organizational model successfully suited to growing high-tech businesses. It shares common features with other incubators in the sense that it provides incubatees with physical workspace, equipment, and administrative and managerial support. However, its key distinguishable feature is its ability to encourage networking among incubatees and help start-ups to meet with potential business allies. Networking among start-ups includes a wide variety of activities from informal interactions such as having daily casual conversations and idea sharing to more formal activities such as forming technology partnerships and sharing interlocking directorates. Hansen et al. stress that networking among incubatees is a crucial component to make incubators more successful.

We agree that encouraging networking among incubatees is an important success factor for incubators. In this paper, we also suggest that in addition to the activities of internal networking, external networking and outsourcing are significant components in the case of Korea where most of incubators are not self-sufficient in providing services and support to incubatees. In the following section, we hypothesize what factors lead incubators to bet-



ter perform.

## THEORY AND HYPOTHESES

A resource dependence perspective emphasizes the importance of the continuing provision of resources - personnel, money, technology, and social legitimacy -for organizational survival in an uncertain environment (Pfeffer & Salancik, 1978). In particular, studies from the resource dependence perspective have focused on the process by which organizations mobilize resources through external ties with other organizations. These studies suggest that the ability of organizations to manage resource dependence relations is determined largely by the structural context, such as the distribution of resources among organizations (e.g., Burt, 1983; Pfeffer, 1987; Baker, 1990). More recently, some scholars have begun to study the path-dependency of interorganizational resource dependence by showing that the accumulation of prior interorganizational ties affects the formation of future ties (e.g., Gulati, 1995; Gulati & Gargiulo, 1999). A broad finding in this research is that an organization's performance is mainly dependent upon the organization's position in the structural or historical resource dependence context.

However, few empirical resource dependence studies to date have examined how emerging small firms survive the competition with more established larger firms. Compared with mature firms, start-up firms are at a disadvantage when accessing critical information and resources, and they have less experience in interorganizational resource exchange. According to the resource dependence prediction, the start-up firms will have a very low chance of survival or, at most, will struggle to compete for a short time. However, we observe that there are many start-ups, and some even flourish. How can start-ups overcome the lack of access to external resources?

Our study assumes that, among others, incubating form of organizations is devised to help start-ups to mobilize external resource critical to their survival and success. Incubators enable their incubatees to gain access to human/financial resources and management expertise. Given this role of the incubating system on resource mobilization, our study investigates which incubators are more successful in making a start-up independent and self-sustaining. More specifically, we focus on two dimensions in the incubating relationship: an incubator's *direct* and *indirect* provision of resources.

*The Range and Quality of Services*

In addition to physical workspace, incubators provide incubatees with a wide range of services as a way to strengthen the ability of the incubatees to survive and prosper. They offer important direct services such as shared administrative services, management and marketing assistance, accounting and legal services, and technology consulting. In more detail, the services provided by incubators include photocopying, fax, secretarial assistance, business and marketing planning, legal assistance, bookkeeping service, recruiting assistance, intellectual property assistance, and so on. By taking all the mundane cares of building business and management, incubators enable startup companies to focus solely on product development (Finer & Holberton, 2002).

**Hypothesis 1.** Incubators that provide a wider range of services and resources perform better.

To accomplish better quality services, we also argue that incubators need more full-time staffs and experts. Incubators need a substantial number of employees who are able to guide and support incubatees through the early stages of growth.

**Hypothesis 2.** Incubators with more number of full time staffs perform better.

*Outsourcing — Leveraging Existing Services*

Incubators in Korea are often too small to provide an extensive scale of management and technology services. As we have presented, the 259 Korean incubators employ a median of 3 people that include full-time managers and administrators. 78% of incubators have fewer than 4 full time employees. These figures show that although incubators need a relatively sizable complement of business experts, technical personnel, and administrators to guide and help tenant companies through the early stages of growth, most of incubators in Korea do not employ enough number of people. According to Hansen et al. (2000), The 169 incubators worldwide in their survey sample employed a median of 15 people. In this respect, it is crucial for incubators in Korea to find qualified partners and experts to outsource their services. Outsourcing and alliance strategies of incubators can help tenant startups better access existing resources and assistance such as technical support from outside experts, managerial assistance from consul-

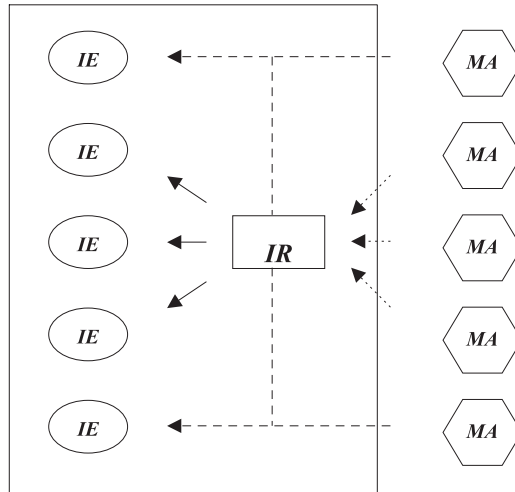


FIGURE 3. RESOURCE FLOWS IN THE INCUBATING FORM OF ORGANIZATIONS

tants, legal advices from law firms, and accounting and bookkeeping services from outside accountants.

**Hypothesis 3.** Incubators that do not outsource their services perform worse.

*Networking Activities*

So far, we emphasize that better qualified technical, managerial, and administrative support of incubators are important success factors. However, we also argue that better networked incubators perform better. By better networked incubators, we mean the incubators that can provide the incubatees with effective internal networking (e.g., networking activities among incubatees) and sufficient external networking as well (e.g., networking with graduates, outside companies, financial institutions, local governments, research institutions, and venture capitals).

**Hypothesis 4.** Incubators that provide more networking activities perform better.

In sum, Figure 3 illustrates an incubating system, where IR denotes an incubator, IE denotes an incubatee, and MA denotes other market actors including bankers, suppliers, and customers. Our first and second hypothe-

ses concerns how the diversity and intensity of the services an incubator provides directly help the incubatees to be an independent firm (solid line in Figure 3). Our third and fourth hypotheses emphasize the role of an incubator as an agent, or gatekeeper of mobilizing external resources for its incubatees. On the one hand, an incubator's resource ties with external actors (subcontractors in our paper) may provide its incubatees with indirect access to those resources (dotted line). On the other hand, the incubator may introduce critical market actors to their incubatees so that the incubatees can utilize the actors as their resource ties (dashed line).

## DATA, VARIABLES, AND METHOD

### *Data and Sample*

We are primarily studying and collecting data on 259 incubators registered in Small and Medium Business Administration as of January 2002. Initial data on those incubators were collected from the Small and Medium Business Administration to assess the characteristics of Korean incubators (e.g., age, size, types of service, full-time support, outsourcing, networking activities, etc.) and their performance (e.g., number of graduates). For the main analyses to evaluate the present performance, we selected 123 incubators founded before February of 2000.

As presented in Table 1, the mean age of the sample is 36 months (3 years) as of January 2002. They have an average of 19 available rooms. They employ 3 full time workers to nurture 14 startups on average. They have produced a mean of 9.1 graduates since they established.

### *Dependant Variable*

We use the total number of graduates (logged) as of May 2002 as a dependent variable to measure the performance of incubators. We sampled rela-

**TABLE 1.** THE CHARACTERISTICS OF INCUBATORS IN KOREA, 2002

	Population (259 Incubators)	Sample (123 Incubators)
Mean Age (as of January 2002)	23 Month	36 months
Mean Size (available room numbers)	17 rooms	19 rooms
Mean Number of Incubatees	13 startups	14 startups
Mean Number of Graduates	5 companies	9 companies
Mean Number of Full-Time Workers	3.3 people	3.3 people

tively mature incubators that already experienced one cycle of hatching time (12 or 24 months) which allows sufficient time to produce graduates.

### *Independent Variables*

**Service Coverage.** Incubators were asked if they covered the following 20 areas of service: (1) secretarial assistance (2) photocopying (3) fax and telephone service (4) mailing service (5) computer program support (6) data processing support (7) documentation assistance (8) Bookkeeping assistance (9) security service (10) webpage support (11) business plan writing support (12) recruiting assistance (13) corporation/factory establishment support (14) contracting and licensing assistance (15) IPO/M&A support (16) patent and intellectual property assistance (17) various legal issue support (18) 24 hour open system support (19) unrestrained facility usage support, and (20) facility rental fee discount. We added up the responses for the 20 service areas and compiled an index of 0 to 20. If an incubator covers all the service areas mentioned above, it gets 20, and if an incubator provides none of the services, it scores 0.

**Full-Time Support.** We employed the number of full time employees of incubator as an indicator of measuring an organizational capacity for better quality support. The full time workers include managers and administrators.

**Outsourcing.** We surveyed if any of the 10 major supporting areas of incubators is outsourced or not. The 10 major supporting activities include (1) management consulting (2) technology and engineering support (3) research and development support (4) legal support (5) marketing and sales support (6) administration support (7) financing support (8) patenting support (9) accounting support and (10) other company/industry specific demand support. We created a dummy variable coded 1 if none of these supporting areas is outsourced.

**Networking Activities.** We surveyed if incubators support six internal and external networking activities. Six networking activities include (1) networking among incubatees (2) networking with graduates (3) networking with outside companies (4) networking with financial institutions (5) networking with research institutions and (6) networking with venture capitals. We include in the model a dummy variable to represent high networking actives. If an incubator supports 5 or 6 networking activities, we consider it as a high networking incubator.

### Control Variables

We also control several organizational capacity variables such as size (total number of available incubating rooms), age (in month), and location of incubators (if the incubator is located in Seoul or Kyongki areas).

## ANALYSIS

We perform a multiple regression analysis that examines what factors affect the performance of incubators in Korea.

## RESULTS

As shown in Table 2, the results present that general organizational capacity matters as the effects of control variables show. Incubator's size and age show positive and significant effects on incubator's performance. Big and old incubators are more likely to produce graduates. The location of incubator does not show a significant relationship with the incubator's performance in our model.

Table 2 also shows that the results support the hypotheses. As stated in Hypothesis 1, Incubators produce more graduates when they offer a broader coverage of service areas, if other conditions being equal. The 123 incuba-

**TABLE 2.** THE PERFORMANCE OF BUSINESS INCUBATORS IN KOREA, 2002

Variable	Expected Sign and Hypothesis	Unstandardized Coefficient
Incubator Size (total number of rooms)	+	.015** (.007)
Incubator Age (in month)	+	.027** (.006)
Location (Seoul or Kyongki areas)	+/-	-.283 (.179)
The coverage of Service Areas	+, Hypothesis 1	.058** (.029)
Full Time Support (Number of Full Time Staff)	+, Hypothesis 2	.154** (.071)
No Outsourcing	-, Hypothesis 3	-.289* (.159)
Strong Networking Support	+, Hypothesis 4	.386** (.201)
Constant		-.257 (.552)
R Square		.304
Number of Cases		123

(1) Dependent Variable: Total Number of Graduates (logged).

(2) Numbers in parentheses are standard errors.

(3) \*  $p < .10$

\*\*  $p < .05$

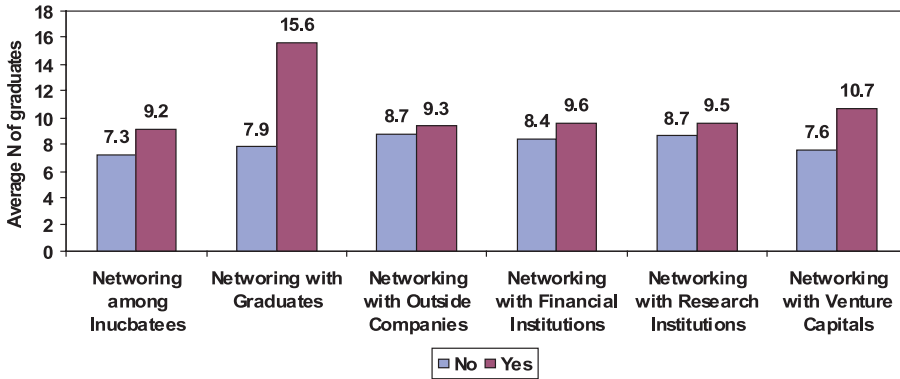


FIGURE 4. NETWORKING ACTIVITIES AND PERFORMANCE

tors cover a mean of 15.6 (a median of 16) out of 20 service areas. When incubators provide large service coverage (19 or 20 service areas), they produce 13.4 graduates on average, while they graduate only 7.5 startups when they offer below-average service coverage (16 or less areas).

The number of full time employees of an incubator shows a significant and positive effect on the performance (Hypothesis 2). Simple mean comparisons also support this finding. Incubators that employ 3 or more full time workers produce an average of 12.8 graduates, while incubators with fewer full time employees produce 8.5 graduates on average.

As predicted in Hypothesis 3, when incubators do not outsource, they perform worse. In our sample the 64 incubators that outsource at least one of their major supporting areas produce more number of graduates (an average of 10 graduates) than the 59 incubators that do not outsource the services (an average of 8 graduates).

Finally, as predicted in hypothesis 4, better networked incubators produce more graduates. Incubators providing high networking support (5 or 6 networking activities) in our sample graduate more startups (an average of 12.5 graduates) than low networking incubators (that produce 8.2 graduates on average). In particular, incubators that support networking between tenant startups and graduates produce significantly larger number of graduates (an average of 15.6) than incubators that do not offer networking with graduates. As illustrated in Figure 4, through all six networking indicators, we observe the positive relationships between networking activities and the performance of incubators. Supporting Hansen et al. (2000), Figure 4 illustrates that the internal networking activities (networking among incubatees) are important. In addition, according to our results, the external networking

activities are also significant factors to make incubators perform better.

## CONCLUDING REMARKS

This study explores the history and present state of business incubation program in Korea. The incubation program in Korea has expanded rapidly with full support of the central government after the 1997 IMF bailout crisis. The Korean government has encouraged the expansion of incubation program as a way to restructure the national economy from a traditional industry-based, large scale economy to a knowledge-based, small scale one. In addition, unemployment was being raised a serious must-solve problem after the financial crisis hit Korea. Accordingly, from 1998 the Small and Medium Business Administration (SMBA) and the Ministry of Information and Communication (MIC) started support operations on business incubation projects as a measure of enhancing the foundation for new technology-based industries, establishing a knowledge-based economy, and creating new jobs.

This paper also examines what factors lead incubators to perform better. Specifically, we find that incubators become more productive when they provide incubatees with a wide variety of technical, managerial, and administrative supports of better quality. Better quality service becomes possible when incubators employ enough full time workers. However, 78% of incubators in Korea employ fewer than 4 full time workers. As a result, the incubators not only need to hire more number of employees but also should develop effective strategies to utilize their alliances and to outsource the services in order to better support the incubatees. For highly labor intensive situations, we argue that effective outsourcing is another crucial factor to increase the productivity of incubators.

In addition, we argue that better networked incubators perform better. Only 20% of the incubators in our sample are offering active networking services to their tenant companies. According to previous research and our results, active internal and external networking is a key source of successful incubation programs. Successful incubators should be able to promote internal networking among incubatees and develop external networking with various actors such as graduates, venture capitals, local governments, and research institutions.

## REFERENCES

Allen, D. N., and McCluskey, R. 1990. "Structure, policy, services and performance



- in the business incubator industry." *Entrepreneurship Theory and Practice*, 15: 61-77.
- Baker, W. E. 1990. "Market networks and corporate behaviour." *American Journal of Sociology*, 90(3): 147-177.
- Burt, R. S. 1983. *Corporate Profits and Cooptation: Networks of Market Constraints and Directorate Ties in the American Economy*. New York: Academic Press.
- Campbell, C. 1989. "Change agents in the new economy: Business incubators and economic development." *Economic Development Review*, 7(2): 56-59.
- Finer, B., and Holberton, P. 2002. "Incubators: There and back." *Journal of Business Strategy*, May/June: 23-25.
- Gulati, R. 1995. "Social structure and alliance formation pattern: A longitudinal pattern." *Administrative Science Quarterly*, 40(4): 619-652.
- Gulati, R., and Gargiulo, M. 1999. "Where do interorganizational networks come from?" *American Journal of Sociology*, 104(5): 1439-1493.
- Hansen, M. T., Chesbrough, H. W., Nohria, N., and Sull, D. N. 2000. "Networked incubators: Hothouses of the new economy." *Harvard Business Review*, September/October.
- Hansen, M. T., Nohria, N., and Berger, J. A. 2000. "The state of the incubator market space." *Harvard Business Review Report*, June.
- Lalkaka, R., and Shaffer, D. 1998. *Nurturing entrepreneurs, creating enterprises: Technology business incubation in Brazil*. International Labor Organization. <http://www.ilo.org/public/english/employment/ent/papers/incuba.htm>
- Latona, J. C., and LeHere, M. D. 1989. *Business incubators in Ohio: Identifying elements for success*. Conference Paper to the Small Business Institute Director's Association. <http://www.sbaer.uca.edu/research/1989/SBIDA/89sbi107.htm>
- Martin, F. 1997. *Business incubators and enterprise development: Neither tried or tested?* University of Stirling Conference Paper to the International Council for Small Business. <http://www.sbaer.uca.edu/research/1997/ICSB/97ics051.htm>
- National Business Incubation Association. 1997. *Tenth Anniversary Survey of Business Incubators 1985 — 1995 :A Decade of Growth*. NBIA, Ohio.
- OECD. 1997. *Technology incubators - Nurturing small firms*. OECD Publications, Paris [http://www.oecd.org/dsti/sti/s\\_t/inte/prod/e\\_97-202.pdf](http://www.oecd.org/dsti/sti/s_t/inte/prod/e_97-202.pdf)
- Pfeffer, J. 1987. "A resource dependence perspective on intercorporate relations." M. S. Mizruchi & M. Schwartz ed., *Intercorporate Relations: The Structural Analysis of Business*: 25-55. Cambridge: Cambridge University Press.
- Pfeffer, J., and Salancik, G. R. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper & Row.
- Rice, M., and Matthews, J. 1995. *Growing New Ventures, Creating New Jobs - Principles and Practices of Successful Business Incubation*. Centre for Entrepreneurial Leadership Inc. Quorum Books.

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