

Business Incubators and Entrepreneurship in Korea: Analyzing Historical Development and Current Situation

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Abstract

This paper examines the overall status and differences of business incubators in Korea. The successful incubation of new firms can contribute to job creation and regional economic development. In the past decade, many new business incubators have been established in Korea with strong government support. This paper reviews how they have developed and what characteristics they have. Based on the data of 263 business incubators in Korea, this paper analyzes the systematic differences in resource endowments and performances by size, sponsoring organization, and geographical location. The results show that there are significant performance differences among business incubators in Korea. The implications of these results are studied and ways to improve the performance of business incubators are suggested.

Keywords: *Business Incubator, Performance, Korea*

1. INTRODUCTION

Entrepreneurship has contributed significantly to economic development and job creation (Shane and Venkataraman 2000). Governments and policy makers all over the world have continuously deployed a variety of policies to promote and support the creation and growth of new ventures (OECD 1998). Although many entrepreneurs and new ventures pursue prospective business opportunities, it is not easy to succeed in highly competitive and uncertain business environment. Most problems that entrepreneurs encounter in the early stages of business development are a lack of legitimacy, tangible resources, and accumulated knowledge, which are critical factors to recognize and seize business opportunities (Stinchcombe 1965). For entrepreneurs who have just started their own business, many difficulties need to be overcome, such as planning the business, securing an office, recruiting talent, marketing, and financing (Kazanjian 1988, Kazanjian and Drazin 1989).

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A business incubator (BI) is an organization that provides physical space and support programs for entrepreneurs or early stage start-ups to deal with difficulties in the initial stages (Mian 1997, Smilor 1987, Smilor and Gill 1986). Entrepreneurs and new ventures in early stages are offered not only inexpensive physical facilities, like office space, but also a wide range of advice and services, such as business planning, new product development, and access to investor networks. Globally, many developed nations as well as developing countries have adopted business incubation as a critical tool for boosting local economies and creating new jobs (OECD 1997). Korea has also joined this stream to promote entrepreneurship through business incubators (Park et al 2000). In order to overcome the increase in unemployment and the local economic recession since Asian Financial crisis, the Korean government has fostered business incubators and provided financial support for their establishment and operation. By the end of 2004, there were more than 300 established business incubators nationwide and more than 8,000 new companies had been created. In spite of this rapid increase of business incubators within only a decade, there are few studies on their characteristics and performance in Korea.

The purpose of this study is to investigate the characteristics of and performance differences between business incubators. Differing from prior studies on perceived performance, this study focuses on the realized performance measured by financial performance of and job creation by tenants of the business incubators. The next section deals with literature on business incubators. The historical development and overview of business incubators are then reviewed. Our research methodology and the analytical results showing the key characteristics of and performance differences among business incubators are discussed. Finally, major issues in Korean business incubators and the policy implications are addressed.

2. LITERATURE REVIEW

A business incubator is an organization that helps entrepreneurs establish their new businesses and supports new ventures in the early stages by providing business advice, contact with business experts, access to external investors, and inexpensive office space and facilities (Smilor 1987). Most business incubators are operated or sponsored by

universities to commercialize technologies invented by their researchers or by regional governments to help regional entrepreneurs develop new local ventures (Mian 1997, OECD 1997). Business incubators have been regarded as an important measure to commercialize technological innovations, create new jobs, and revitalize regional economies. According to the National Business Incubation Association, an estimated 587 business incubators were operating in the North America region in 1998, a huge increase from the approximate 10 in 1981. OECD reported that more than 2,000 business incubators were operating worldwide as of 1992. In addition, more and more countries in both developed nations and developing countries have steadily set up business incubators to foster national cutting-edge industries and to generate more new jobs (Lalkaka 1997).

The literature on business incubators has reported numerous success factors based on multiple case studies on successful incubators and empirical studies with a limited number of incubators (Allen and McClusky 1990, Allen and Rahmam 1985, Sherman 1999). For instance, the key success factors of business incubators include the goal and operational strategies (resident/graduate regulations, management over resident companies), organizational structure (board of executives, professional group, center head), resources (center size, operation budget), support service (tangible and intangible support service), and outreach to outside networks (central and regional government, university and research institute) (OECD 1997, Lalkaka 1997, Molnar et al. 1997, Park et al. 2000, Smilor 1987).

Business incubators around the world have similar business services for their tenants under their organizational mission and objectives. Lee and Osteryoung (2004) comparatively analyzed the success factors between business incubators in Korea and those in the US. They revealed that there were no significant differences between business incubators in the two countries in terms of goals and operations strategy, physical and human resources, incubator services, and networking programs.

Park et al. (2000) investigated key issues of business incubators in Korea. They assessed that business incubators in Korea operated under unclear objectives and provided undifferentiated programs for their tenants. As most business incubators were developed within relatively short time periods with government support, they lacked experience in and knowledge of business incubating programs. Park et al. also found that entrepreneurs and new ventures in business incubators are faced with many difficulties in effectively developing their businesses, getting advice from external experts, and

accessing valuable resources such as technological developments and financial investments.

Previous studies on business incubators rely on experience and statistical analyses of a limited number of business incubators (Mian 1997, Lee and Osteryoung 2004). These studies also analyzed the performance of business incubators by measuring cognitive performance, such as the general satisfaction of tenant firms, rather than by evaluating objective performance, like financial performance and job creation by tenant firms. As their eventual goal is to help residents succeed in their businesses, the performance of business incubators can only be assessed by the success and growth of entrepreneurs and tenant firms. Recently, Mian (1997) developed a conceptual framework that systematically assesses business incubators by performance outcome, effectiveness of management policies and practices, provision of services, and the value of that service. The performance outcomes of business incubators are sub-categorized into sustainability and growth of business incubating programs, survival and growth of tenant firms, contributions to sponsoring university's mission, and community related impacts. Unlike previous studies, the framework incorporates the realized performance of entrepreneurs and start-ups in business incubators as the most important indicators for measuring the performance of the incubators.

3. HISTORICAL OVERVIEW of BUSINESS INCUBATORS in KOREA

Business incubators in Korea can trace their beginnings to 1993, when the first professional business incubator was founded by a private firm. This private business incubator cultivated only a small number of entrepreneurs and had little impact on regional economic development and job creation. In the 1990s, there was an increasing demand to commercialize new technology or support regional start-up companies. With the financial support of the Ministry of Science and Technology (MOST), a new business incubator was established and operated by KAIST (Korea Advanced Institute of Science and Technology, a leading research university in Korea. This incubator has helped entrepreneurs and new ventures to develop their businesses by using relatively inexpensive physical facilities and by collaborating with researchers in the university.

The upheaval of the Asian financial crises in the late 1990s served as the turning point for the development of business incubators in Korea. Because of corporate restructuring and decrease in firm performances, a number of employees were laid off and had difficulty in finding new jobs. Job creation and revitalization of the regional economy were poised to become the most pressing social problems. Considering the promotion of entrepreneurship as an important tool to create new jobs and recover economically, the Korean government actively supported the establishment of business incubators in order to promote start-ups and their steady growth. Many business incubators were simultaneously established and financially supported by diverse government departments such as MOCIE (Ministry of Commerce, Industry and Energy), MIC (Ministry of Information and Communication), MCT (Ministry of Culture and Tourism), and the SMBA (Small and Medium Business Administration).

As a result, the number of Korean business incubators skyrocketed and reached 289 in 2004, ten times the 29 business incubators in 1998. Initial government support focused on constructing and establishing physical facilities such as new buildings and business office facilities. As shown in Table 1, a total of 3,972 entrepreneurs and new start-ups resided in the 289 business incubators across the nation. Also, the number of graduate firms steadily increased to 3,415 from the 258 in 2000. The 3,972 tenant firms hired 19,387 employees, creating 5 new jobs in each firm. The total revenue of all the tenants within the business incubators reached KRW 1.2 trillion, with an average of KRW 0.3 billion per tenant.

The Korean business incubators have gradually contributed to job creation and economic development over the years. This means that they have successfully helped entrepreneurs and new ventures in early stages to successfully setup and run their businesses. The average number of employees in tenant firms increased from 3 employees in 2000 to 5 employees in 2004 (a 65.9% increase), and the average sales revenue amounted to KRW 302 million in 2004 from KRW 166 million in 2000 (a 81.9% growth). Despite the growing performance of business incubators, there are little information and studies on what the key characteristics are and whether there are significant differences among business incubators.

Recently, the Korean government redirected policies on business incubators toward the stable operation and performance enhancement of existing ones rather than the creation of new ones. As existing funding systems on business incubators mostly depends

on size and total number of tenants firms, incubator managers have paid little attention on overall performances of incubator. Under new policy directions on business incubators, the performance of business incubators is very important to get operating budgets and financial subsidy in developing diverse supporting programs for their tenant firms.

Table 1. Growth and Statistics of Business Incubators in Korea

	1998	2000	2002	2004
Total number of BIs	29	220	275	289
Total number of tenants in BIs	240	2,188	3,717	3,972
Total employees of tenants in BIs	n.a.	6,442	19,762	19,387
Total sales volume (KRW bil.)	n.a.	366	830	1,202
Total number of graduate firms	27	258	1,577	3,415
Average number of full-time employees in tenant firms	n.a.	2.94	5.32	4.88
Average sales volume (KRW mil.)	n.a.	166	223	303

Source: Korean Small and Medium Business Administration

4. METHODOLOGY

4.1 Sample and data collection

The purpose of this study is to present the overall status of Korean business incubators and comparatively analyze the characteristics and performance of different types of business incubators. For this, this study used data from 263 Korean business incubators. The data was originally collected by the SMBA (Small and Medium Business Administration), the Korean government authority responsible for policies on SMEs, to assess the overall status and management systems of Korean business incubators. The SMBA collected objective data, for instance physical size, annual budget, and performances, to review overall situations and management. Each business incubator made its general characteristics and performance publicly available to attract promising entrepreneurs and new ventures. Of the total 289 business incubators, overall 263 data are used for analysis excluding 26 with in information.

Previous studies on business incubators have investigated with little sample data or case studies on successful business incubators. We used sample data covering 91% of all Korean business incubators, which is a dataset appropriate for studying the overall status of business incubators in Korea and for investigating the key characteristics and performance differences among diverse types.

4.2 Measurement

The variables of this study can be broadly categorized into independent variables on types of business incubators and dependent variables on key characteristics and performances of business incubators.

The types of business incubators were categorized according to their total size, sponsoring organization, and geographical location. The size classifications were small-sized (less than 10 tenant firms), medium-sized (10 to 20 tenant firms), and large-sized (more than 20 tenants) depending on the total number of entrepreneurs, new ventures, and tenant firms cultivated at the same time. Although the size of a business incubator can be measured by physical area which is highly related to the number of tenant firms. The number of tenant firms can also be practically used to assess the size of the incubators, so this study measured the size of a business incubator as the total number of its tenant firms.

Most business incubators in Korea are sponsored by one of three different organizations: 4-year universities, 2-year colleges, or government-related organizations, such as government research institutes and government agencies specializing in supporting small and medium-sized businesses. In this paper, business incubator sponsoring organizations were categorized into the above three types, with different objectives and capabilities within each organization.

Business incubators can also be classified by geographical location. Depending on the population of the region where each business incubator is located, each one was categorized into a metro region or non-metro region. In this study, a region with a population of more than one million within the local government's authority was regarded as a metro. A region with a population less than a million was classified as non-metro. Of the total of 16 regions, 6 were regarded as metro and the other 10 were classified as non-metro.

The key characteristics of business incubators were measured on the general status and resource endowment of each incubator. The general status includes operation years from inception, physical space size, and total number of tenant firms.

The resource endowment of a business incubator was measured in terms of human and financial resources. For human resources, the number of BI managers and the administrative work force were measured. Human resources are very important for business incubators to manage different tenant firms and help each one to succeed in their residence period. Also, they can provide valuable information and connect external resource holders to tenant firms. Talented managers can play important roles in nurturing tenant firms to success and in effectively managing business incubators.

The financial resources of a business incubator were measured by the total annual financial budget and the internal investment ratio of that budget. The more the financial budget, the more business incubators can develop support programs for their entrepreneurs and new ventures. As a business incubator can be affordable to invest internal financial resources, it can develop diverse programs and operates by itself without external financial support.

The performances of business incubators were measured by the average revenue and the average number of employees per tenant within a business incubator. Although previous researchers tended to use cognitive performance, measured as a level of satisfaction, this study measured more realized and objective performances of business incubators. The eventual goal of an incubating program is to help entrepreneurs and new ventures to develop and sustain their businesses successfully. Only the financial performance of and job creation in tenant firms indicates the effectiveness and operating performances of business incubators. Sales revenue indicates how successful the businesses of each tenant are in competitive markets. The number of employees is another measure of the operational success of the tenant. Both performance measurements indicate how business incubators contribute to job creation and regional economic development.

The general overview of Korean business incubators can be summarized as follows. The average number of operation years is 4.25, and on average, 3 internal employees manage 15 tenant firms. The average annual financial budget is KRW 167 million, 64%

of which is from internal investments and office rent. With regard to the distribution of business incubators, there were 52 (20%) small-sized BIs hosting less than 10 tenants, 165 (63.5%) medium-sized BIs hosting between 10 and 19, and 43 (16.5%) large-sized BIs with more than 20 entrepreneurs and new ventures. Korean universities sponsor half of all business incubators: 133 (50.6%) 4-year university BIs, 95 (36.1%) college BIs, and 35 (13.3%) BIs operated by government-related organizations. Business incubators located in metro regions accounted for 139 (52.9%), and business incubators located in non-metro regions accounted for 124 (47.1%). The differences among business incubator types are analyzed by ANOVA test.

5. RESULTS

5.1 Differences by Size

A series of ANOVA tests were conducted on the differences among various-sized business incubators. As shown in Table 2, there are significant differences in resource endowment and financial performance. In general, larger business incubators with more physical space hold more administrative employees responsible for managing tenant firms and financial resources. However, there are no significant differences in the internal investment ratio. This indicates that most Korean business incubators finance their operational budgets from government subsidies and from office rent from tenants.

A significant difference in the performance of business incubators by the number of their tenants] was found. Looking at the average sales revenue, small-sized business incubators hosting less than 10 tenants show the highest revenue with KRW 535.60 million. The average sales revenue within medium-sized or large-sized business incubators is much lower. There is little difference between the average sales of tenants in medium-sized incubators and the average sales of new ventures in large-sized ones. In addition, the higher performance of tenants within small-sized business incubators is shown in the average number of employees. These performance differences indicate that smaller business incubators outperform larger ones in term of sales volume and new job creation.

Table 2. Comparison of Business Incubators by Size

	Small-size BI (less than 10) (n=52)	Medium-size BI (10~19) (n=165)	Large-size BI (more than 20) (n=43)	ANOVA F-Value
General Status of BI				
Operation years	4.33	4.12	4.63	2.157
Physical size (m ²)	634.33	928.88	2,418.03	33.285***
Total number of tenants	7.23	13.62	26.74	288.917***
Internal Resources of BI				
Number of BI managers	1.44	1.80	2.19	4.438*
Number of BI administrators	0.87	1.06	1.65	12.510***
Financial budget (KRW mil.)	118.44	149.75	291.58	19.083***
Ratio of BI investment in total budget (%)	0.65	0.63	0.64	0.255
Performance of BI				
Average sales of tenants (KRW mil.)	535.60	247.91	283.72	2.570 ⁺
Average employees of tenants	6.35	4.46	4.70	5.012**

+ p<.1, * p<.05, ** p<.01, ***p<.001

5.2. Differences by Sponsoring Organization

The characteristics of business incubators by sponsoring organization are shown in Table 3. Business incubators operated by government-related organizations are longer running and larger sized than those sponsored by academic institutions. Although there is little significant difference in human resources, there are significant differences in financial resources. Government-related business incubators have a larger amount of their annual budget financed and a higher internal investment ratio than academic institution sponsored incubators. This means that government-related business incubators invest a substantial amount of funds for improving their incubating programs other than outside funds.

The significant performance differences among business incubators can be summarized. The average revenue of tenant firms residing in government-associated business incubators is KRW 570.52 million, 2.5 times that of tenants in university-

operated business incubators (KRW 237.25 million). In addition, a tenant firm within a government-associated business incubator hires an average of seven employees while that within a university-operated business incubator hires an average of four or five. This indicates that business incubators sponsored by government-associated organizations show higher performance in terms of average revenue or job creation than those operated by academic institutions.

Table 3. Comparison of Business Incubators by Sponsoring Organization

	University BI (n=133)	College BI (n=95)	Government BI (n=35)	ANOVA F-Value
<i>General Status of BI</i>				
Operation years	4.20	3.94	5.29	12.013***
Physical size (m ²)	1,006.45	791.98	2,149.85	15.643***
Total number of tenants	15.24	13.12	15.14	2.583 ⁺
<i>Internal Resources of BI</i>				
Number of BI managers	1.92	1.51	2.00	3.831*
Number of BI administrators	1.51	0.98	1.03	1.595
Financial budget (KRW mil.)	163.20	131.63	275.08	11.318***
Ratio of BI investment in total budget (%)	0.61	0.62	0.78	8.914***
<i>Performance of BI</i>				
Average sales of tenants (KRW mil.)	237.25	236.64	570.52	16.383***
Average employees of tenants	4.88	3.87	7.34	11.303***

+ p<.1, * p<.05, ** p<.01, ***p<.001

5.3 Differences by Geographical Location

The differences of business incubators by geographical location are shown in Table 4. In this study, the geographical location is categorized by population size into a metro region (with a more than one million population) and a non-metro region. Although there is no significant difference in physical space size, there are significant differences in operation years and the number of tenant firms. In general, business incubators located in

metro regions are more experienced and nurture more entrepreneurs and new ventures. Although human resources show no significant difference, larger annual financial budgets and higher internal investment ratios are found in business incubators in metro regions

The performance of business incubators substantially varies according to the geographical location. The average revenue of tenant firms in business incubators located in metro regions reaches KRW 350.93 million, 1.5 times that of tenants in non-metro regions (KRW 204.34 million). In addition, the tenants in metro regions hire, on average, six employees, while tenants in non-metro regions hire, on average, four. This indicates that there is a significant difference in business incubator performance according to the geographical location.

Table 4. Comparison of Business Incubators by Geographical Location

	Non-metro region BI (n=124)	Metro region BI (n=139)	ANOVA F-Value
<i>Physical Status of BI</i>			
Operation years	3.99	4.48	7.584**
Physical size (m ²)	1,008.78	1,203.11	1.463
Total number of tenants	13.37	15.44	5.375*
<i>Internal Resources of BI</i>			
Number of BI managers	1.91	1.66	2.707
Number of BI administrators	.97	1.51	3.487 ⁺
Financial budget (KRW mil.)	120.34	208.04	21.538***
Ratio of BI investments in total budget (%)	0.60	0.67	8.487**
<i>Performance of BI</i>			
Average sales of tenants (KRW mil.)	204.34	350.93	12.744***
Average employees of tenants	3.99	5.60	11.875***

+ p<.1, * p<.05, ** p<.01, ***p<.001

6. DISCUSSION and CONCLUSIONS

The objectives of this paper were to review the general situation of Korean business incubators and to investigate systematic differences in characteristics and performances among various types. The historical development shows that the policy of Korean business incubators was to press ahead for entrepreneurship to create more jobs and to boost local economies by responding to outside environment changes such as financial crises. With the support of the central government, a great number of business incubators was established over the nation within a relatively short time period. From a general perspective, the average performance of business incubators has been improving steadily.

Despite the increasing performances of business incubators, there are significant differences in resource endowments and performances. The number of tenants, the sponsoring organization, and the geographical location of business incubators are associated with these differences. In particular, small-sized business incubators with relatively limited resource endowments showed high performance in terms of revenue and new job creation. The different performance of business incubators could be attributed to a lack of capability and weak synergy effects that could be generated by close interactions among tenants and active interactions between tenants and other external institutions. Smaller business incubators are able to do more to help entrepreneurs and new ventures solve diverse business problems and develop competitive capabilities because the limited number of entrepreneurs means that managers have more time to interact with each one. When business incubators nurture more entrepreneurs, managers have to spend more time handling administrative activities because of the extra standardized incubating processes and formalized support programs. As the number of tenants in business incubators increases, it becomes relatively harder to offer specific support to individual entrepreneurs and for new ventures.

The performances of business incubators also differ by their sponsoring institutions. As seen in our results, business incubators operated by academic institutions such as universities and colleges generally show a low level of performance; this may be attributed to the fact that domestic business incubators were established in such a short time period by active central-government initiatives. For expansion, the government has provided most academic institutions that intend to formulate and implement business incubators with financial resources. As a result, to receive government subsidies for

business incubator programs, academic institutions may have unconsciously adopted uniform business incubator programs and may have little commitment to develop their own specialized programs. Academic institutions have unclear objectives for their business incubators and only generalized support programs for their tenants. They also have little experience in and knowledge on incubating entrepreneurs and new ventures. Compared with the lack of expertise and competency shown by academic institutions, the government-associated business incubators are reaping excellent outcomes by migrating start-up companies.

Even though most Korean business incubators were established in a similar period, there is a significant difference in their performance according to their geographical location. Those located in a metro region with a high population show higher performance results than those located in a non-metro region. The geographical location is the foundation for entrepreneurs to access invaluable information, obtain financial investments, and provide their products and services. The start-up companies located in metro regions are more likely to use the various information and resources available in the applicable regions. Noticeably, business incubators located in relatively underdeveloped regions showed lower performance in fulfilling the fundamental role of contributing to revitalizing local economies.

The results of this paper suggest some practical implications for the future of business incubators in Korea. To improve business incubator performance, the development and operation of more effective support programs depending on the characteristics of the incubators is required. It is difficult to expect the success of entrepreneurs when only standardized support programs are available. It is also necessary to clarify a business incubator's key objectives and develop appropriate support programs to help tenants. University-supported business incubators should consider how to build their capabilities to incubate and nurture new ventures in the early stages. One approach is to recruit highly talented people to manage the incubators and develop effective programs. They should also develop their capabilities by using the diversity of knowledge and competency that universities retain and by building close collaborative relationships with a wide range of experts within the local communities. When business incubators develop their support programs, they should consider the characteristics of their geographic location that differ from other regions. A local business incubator can

contribute to the local economy when its tenants successfully graduate and consequently grow within the region.

This study is a comparative analysis of the general situation of Korean business incubators with many limitations, such as excluding their service activities and relationships with sponsoring institutions. Future research on business incubators will be extended to investigate their and their tenants' key performance determinants. More studies will contribute to expanding our knowledge on this area and to developing effective business incubator programs for regional development.

References

- Allen, D. N. and McClusky, R.** 1990. "Structure, Policy, Service, and Performance in the Business Incubator Industry," *Entrepreneurship Theory and Practice*, 15(2), 61–76.
- Allen, D. N. and Rahmam, S.** 1985. "Small Business Incubators: A Positive Environment for Entrepreneurship," *Journal of Small Business Management*, 23(3), 12–22.
- Kazanjian, R. K. and Drazin, R.** 1989. "An Empirical Test of a Stage of Growth Progression Model", *Management Science*, 35(12), 1489-1503.
- Kazanjian, R. K.** 1988. "Relation of Dominant Problems to Stages of Growth in Technology-Based New Ventures," *Academy of Management Journal*, 31(2), 257-279.
- Lalkaka, R.** 1997. *Supporting the Start and Growth of New Enterprises*, United Nations Development Programme, New York.
- Lee, S. S. and Osteryoung, J. S.** 2004. "A Comparison of Critical Success Factors for Effective Operation of University Business Incubators in the United States and Korea," *Journal of Small Business Management*, 42, 418-426.
- Mian, S. A.** 1997. "Assessing and Managing the University Technology Business Incubator: An Integrative Framework," *Journal of Business Venturing*, 12, 251-285.
- Molnar, L.A., D.R. Grimes, J. Edelstein, R. DePietro, H. Sherman, D. Adkins, and Tornatzky, L.** 1997. "Impact of Incubator Investment," NBIA publications, University of Michigan
- OECD.** 1997. "Technology Incubators: Nurturing Small Firms," Organisation for Economic Co-operation and Development, Paris.
- OECD.** 1998. "Fostering Entrepreneurship," Organisation for Economic Co-operation and Development, Paris.
- Park, S., Lee, J-H., Lee, D-H., and Bae, Z-T.** 2000. "A Study on the Situation Analysis and Future Direction of Business Incubators in Korea," *Korea Venture Management Review*, 3, 39-71.
- Shane, S.A. and Venkataraman, S.** 2000. "The Promise of Entrepreneurship as a Field of

- Research,” *Academy of Management Review*, 25, 217–226.
- Sherman**, H. D. 1999. “Assessing the Intervention Effectiveness of Business Incubation Programs on New Business Startup,” *Journal of Developmental Entrepreneurship*, 4(2), 117–133.
- Simlor**, R. W. 1987. “Managing the Incubator System: Critical Success Factors to Accelerate New Company Development,” *IEEE Transaction on Engineering Management*, 34, 146-155.
- Smilor**, R. W. and **Gill**, M.D. 1986. “*The New Business Incubator: Linking Talent, Technology, Capital, and Know-How*,” D.C. Heath and Company, Lexington: MA, U.S.A.
- Stinchcombe**, A. L. 1965. “*Social Structure and Organization*,” In: March, J. G. (Ed.), *Handbook of Organizations*. Rand McNally, Chicago, IL, 142–193.
- Tornatzky**, L. G. 1997. “*Impact of Incubator Investments*,” National Business Incubation Association, Athens: Ohio.
- Tornatzky**, L. G., **Batt**, Y., **McCrea**, N. E., **Lewis**, M. S., and **Quittman**, M. 1996. “*The Art and Craft of Technology Business Incubation: Best Practices, Strategies, and Tools from more than 50 Programs*,” National Business Incubation Association, Athens: Ohio.

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