

Locational Dynamics of Manufacturing Industries in the Inner Area of Seoul*

Kie-Joo Hyong**

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The study on inner city manufacturing location is divided largely into two main subjects. The one concerns practical issue, and the other concerns theoretical issue¹⁾. Either one is related to inner city decline, unemployment²⁾ and desirable

redevelopment of the inner city.

The purpose of this study is to analyze the industrial locational change in Greater Seoul over the last 10 years and to give an answer to the following questions through the cases of Chung-

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** Professor, Department of Geography Education, Dongguk University

1) See Cameron, G.C., 1973, "Intraurban Location and the New Plant," Papers of Regional Science Association, Vol. 31, pp.125-144.

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2) See Elias, P. & Keogh, G., 1982, "Industrial Decline and Unemployment in the Inner City Areas of Great Britain; A Review of the Evidence," Urban Studies, Vol. 19, pp.1-5.

Lloyd, P.E. & Mason, C.M., 1978, "Manufacturing Industries in the Inner City; A Case Study of Greater Manchester," Trans. of the Inst. of British Geographers, Vol. 3, No. 1, pp.66-90.

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ku and Songdong-ku in Seoul. First, what are the characteristics of birth, death, viability and relocation of plants? Second, is the incubator hypothesis verified indeed in the case of Seoul? Two interpretations on the intraurban manufacturing location of Greater Seoul may be concer-

ned with the study: one focused on economic impact³⁾, the other on facts and issues⁴⁾. Both are macroscopic studies, not microscopic studies on the locational behavior. This study will macroscopically deal with the manufacturing distribution of Greater Seoul and its change, and

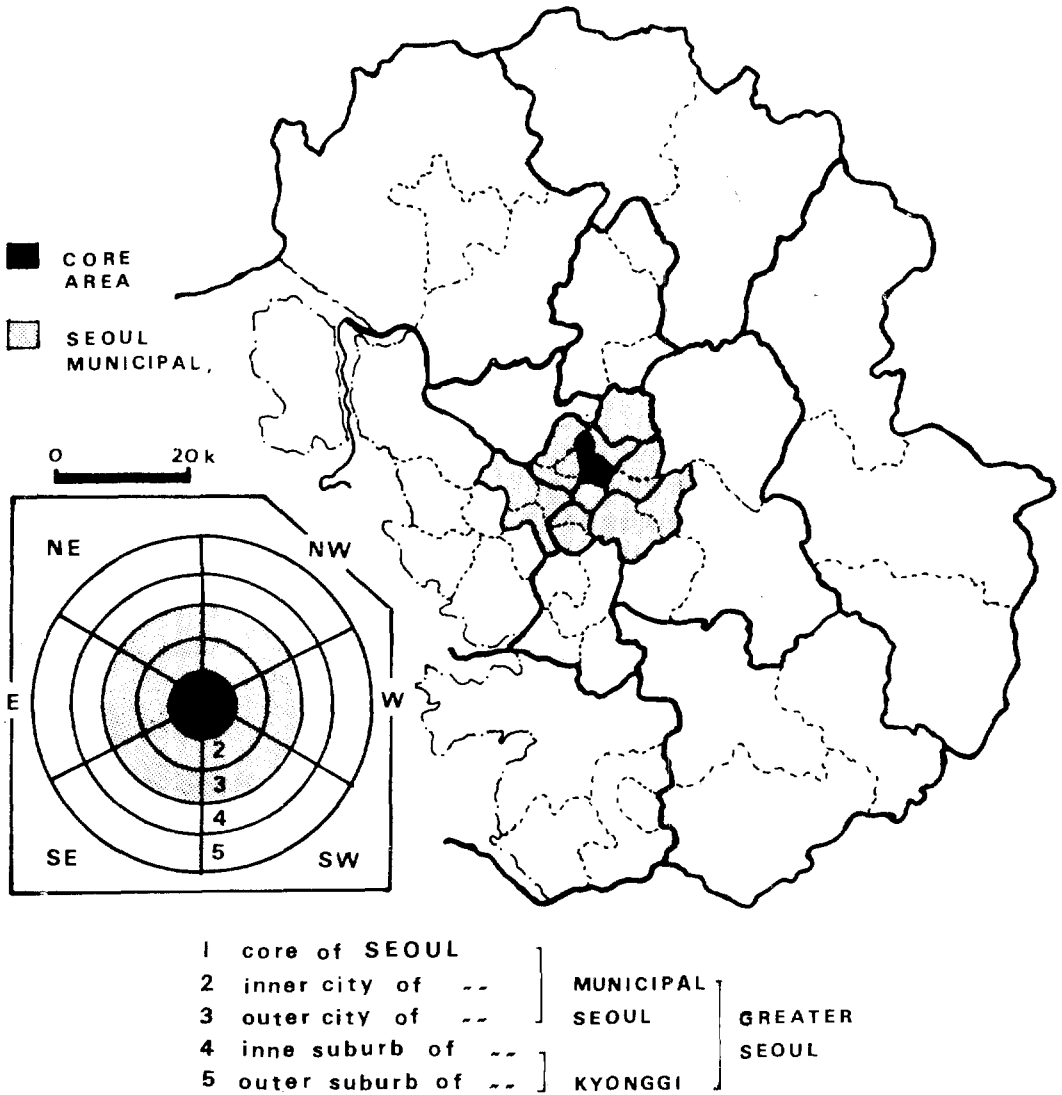


Fig. 1. Subdivision of Greater Seoul (Rings and Sectors)

3) Won-Yong Kwon, 1981, "A Study of the Economic Impact of Industrial Relocation; the Case of Seoul," *Urban Studies*, Vol. 18, pp. 73-90.
 4) Sang-chuel Choe, Byung-Nak Song, Dong-Hoon Chun & Won-Yong Kwon, 1984, "Intrametropolitan Industrial Location in the Seoul Region: Facts and Issues." *Proceedings of the Korea-US Joint Seminar, KRSA*, pp. 45-70.

will microscopically analyze the behavior of plant in the inner city.

1. Data and Method

For the convenience of this study, the present author will name the Kyonggi Province area including Seoul as Greater Seoul and divide it into five concentric circles as follows:

1st Ring...Core of Seoul	} Municipi- pal Seoul	} Gre- ater Seoul	
2nd Ring...Inner City of Seoul			
3rd Ring...Outer City of Seoul			
4th Ring...Inner Suburb of Seoul			} Kyon- ggi
5th Ring...Outer Suburb of Seoul			

To clearly describe the directions of factory movements and the axes of industrial growth, Greater Seoul is divided into 6 sectors except the core area. Namely, they are: the west direction of the Seoul-Inchon axis, the east direction of the Seoul-Yangpyong axis, the northwest direction of the Seoul-Munsan axis, the northeast direction of the Seoul-Yonchon axis, the southeast direction of the Seoul-Ansong axis, and the southwest direction of the Seoul-Hwasong axis.

The basic data for this study was collected from three different sources. For the purpose of

analyzing the industrial locational change of Greater Seoul in its entirety, the manufacturing census data by city and county (1973, 1978, 1981) kept at the Economic Planning Board was used. But, as the data didn't show the microscopic movements of plants including their sites, the annual change in birth and death and the patterns of their movements, the Register of Manufacturing Establishments kept at Ward Offices was used to supplement the information.

Since the Register includes the dates of birth and death of establishments, migration destinations and zoning, it is greatly helpful to understand the locational behavior of the manufacturing industries. The validity of the incubator hypothesis would be successfully verified for small-scale plants. Therefore, questionnaires were distributed to small-scale establishments to see their experiences, migrations for business, reasons for the choice of their locations, hoped-for locations, acceptance of technological innovation, linkages with other firms and so forth.

A stratified sampling was made by industrial group through test sampling. In Chung-ku, 71 samples were taken from 562 establishments and in Songdong-ku, 124 samples from 1015 establi-

Table 1. Concentric and Sectoral Division of Greater Seoul

Circles \ Sectors	1 Core	2 NW Munsan	3 NE Yonchon	4 E Yang P.	5 SE Ansong	6 SW Hwasung	7 W Inchon
1 Core	Chung-ku Chongro						
2 Inner city		Sudaemun Uenpyong Mapo	Sungpuk	DongD.	Songdong	YongS.	
3 Outer city			Dobong		GangD. GangN.	DongJ. Kwanak	YongDP. Kuro GangS.
4 Inner suburb		Koyang	EujongB. YangJ. DongduC.	NamY.	KwagJ. SongN.	Anyang Suwon Ansan GwaC.	Buchon KwangM. Inchon Kimpo ShiH.
5 Outer suburb		Paju	Pochon Yonchon	Kapyong YangP. Yoju	YongI. Ichon Ansong	Hwasung PyongT. SongT.	KangH.

shments. The major part of them is composed of printing in Chung-ku and machinery in Songdong-ku.

The reason that Chung-ku and Songdong-ku were chosen to grasp the industrial location patterns of the inner city is that the clustering core area for small-scale plants is Chung-ku, the core of Seoul city, where Chungmu-ro, Inhyondong, Ulch-ro, and Taepyong-ro are included, and that Songdong-ku, adjacent to Chung-ku, has been most heavily industrialized since the 1960's in the north of the Han river except Yongdungpo-ku and Kuro-ku in the south of the river.

For convenience, Chung-ku is treated as the core area and Songdong-ku as the inner city of Seoul. The concentric and sectoral division of Greater Seoul is shown in Table 1.

2. Some Evidence from Census Data

There had been little change, from 1973 to 1981, in the share of the manufacturing industry in Greater Seoul including Seoul and Kyonggi Province in terms of the number of employees. That's because Greater Seoul occupied 48% of the total manufacturing workers of Korea in 1973 and 45% in 1981.

However, the change within Greater Seoul is so drastic that the rates of share between Seoul and Kyonggi Province are 71 : 29 in 1973 and 47 : 53 in 1981, reflecting the results of the decentralization policy by the government. The average annual rate of employment growth was 0.7% in Seoul from 1973 to 1981, while the rate was 14% in Kyonggi Province, showing a drastic growth in satellite cities, particularly in Buchon, Incheon, Ansan, and Songnam.

After all, the economic boom in the 1970's

and the policy to control overpopulation probably led to rapid industrialization of the neighboring areas of Seoul. Observing this fact in terms of the five concentric areas, as pointed out earlier, employment was reduced in the core area and the inner city, as was demonstrated by Choe and Song,⁵⁾ while that was increased in the outer city (3, 4, 5 Ring) : particularly, there was a remarkable increase in employment in the inner suburb. This area is located within a radius of 15~40km from the civic center⁶⁾ and it includes satellite cities like Incheon, Buchon, Ansan, Anyang, Suwon and Songnam.

Observing the locational change by sector related to major transportational directions, employment had been indeed reduced in the core area since 1973, and the same was true of Seoul-Munsan (NW axis), and Seoul-Yonchon (NE axis), indicating the unfavorable industrial locations for reasons of national defense.

On the other hand, the Seoul-Incheon (W axis) direction, the Seoul-Hwasong (SW axis) direction and the Seoul-Ansong (SW axis) direction, which were encouraged by the improved network of roads and railroads, and the investments in the infrastructure for the construction of new cities, have a remarkable growth in employment. Also in the Seoul-Yangpyong (E axis) direction, there has been a rapid growth in manufacturing employment since 1973. However, since the area is a source of water supply for the metropolitan area, there are a lot of restrictions for industrial locations.

After all, Greater Seoul in the period of high growth is clearly divided into the unfavorable part of the north and the favorable part of the south for industrial location. This phenomenon is influenced by the government's policy to develop a transportational network and to control

5) Ibid., pp. 56-59.

6) According to the survey of Ministry of Commerce and Industry 1979, 90% of the total entrepreneurs of relocatable industries desires their moving distance less than 30km from the major urban center.

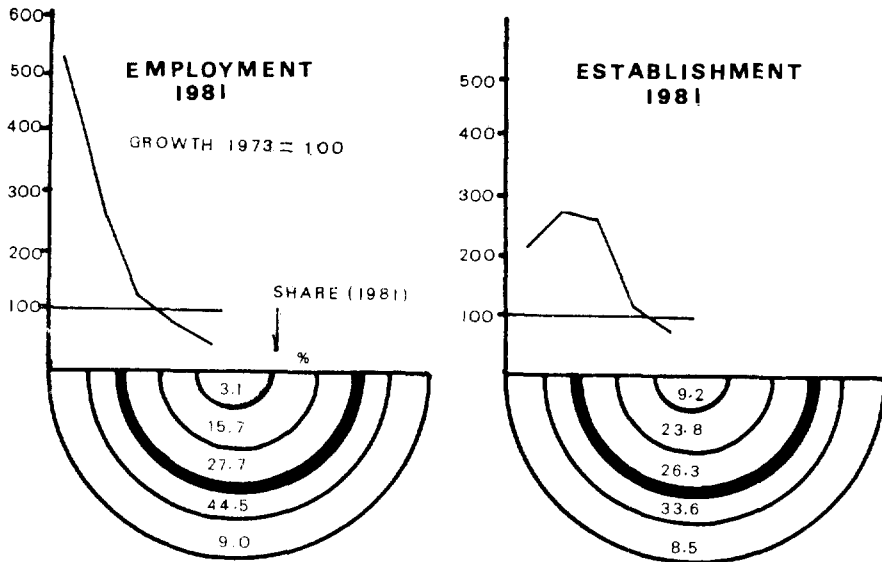


Fig. 2. Manufacturing Growth and Share by Ring

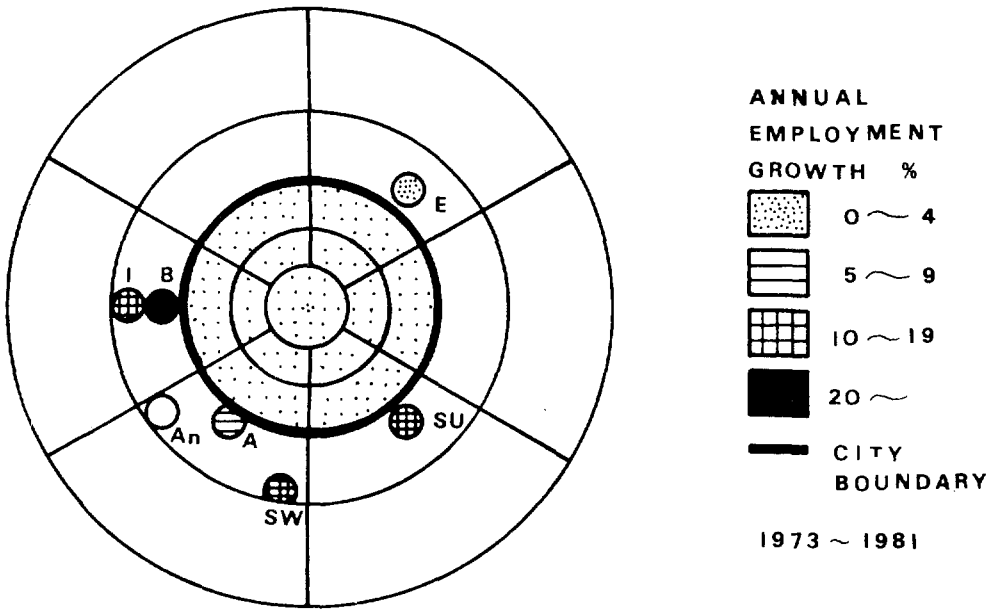


Fig. 3. Annual Employment Growth of Manufacturing in Greater Seoul

I(Inchon), B(Buchon), An(Ansan), A(Anyang) SW(Suwon), SU(Songnam), E(Eujongbu)

overpopulation in the capital city of Seoul.

Taking now a look at the shares of industrial employment by concentric circles and sector as of 1981, the inner suburb (4 Ring) occupies 44.5% of the total employment in Greater Seoul.

Among the sectors, 44% of the total is concentrated in the Seoul-Inchon (W axis) direction, showing ultimately that the industrialization of the 4th Ring between Seoul and Inchon is most remarkable.

According to the Three Development Zones⁷⁾ established by the Industrial Location Act, the areas which fall under the inner suburb of Seoul-Inchon (W axis), Seoul-Hwasong (SW axis), and Seoul-Ansong (SE axis) directions will be excluded from being industrialized from the present level. These areas are designated as a development withholding zone even in the Greater Seoul Development Plan. The reason that the government adopts such a policy is that the control of overpopulation in Seoul consequently led to the rapid growth of the suburban area. This is no more than a substantial expansion of the urbanized or industrialized area.

3. Manufacturing Importance of the Core Area

Analyzing only the census data, manufacturing in the core and the inner city is obviously constricted in their relative importance. The share of establishments in Chung-ku is decreased from 21.7% of the total of Seoul in 1973 to 11.7% in 1983 and employment from 7.7% to 5.1% and in Songdong-ku, establishment from 18% to 13% and employment from 17% to 14%.

Even though the relative share of the establishments and the employment was decreased, the following three facts cannot be overlooked. First, when the total number of establishments with more than one employee is considered, the share of Chung-ku is still important in spite of the decentralization policy in the 1970's. Second, when the number of establishments is considered instead of the number of employees, the importance is more emphasized. Third, as far as printing, publishing, and clothing industries are concerned, the preference for the core area is very high as their industrial sites. Table 2 proves this fact. When the phenomenon is observed from three digital manufacturing groups instead of

Table 2. Core Area, Chung-ku, Manufacturing Share in Seoul

	Establishment %	Employment %
more 5 Persons*		
3 manufacturing	11.7	5.1
32 textile, clothing	15.8	5.0
34 paper, printing	38.5	25.3
more 1 Person**		
3 manufacturing	15.2	14.5
32 textile, clothing	14.1	16.2
34 paper, printing	45.1	33.9
322 clothing	15.6	13.7
341 paper	22.9	18.6
342 printing	50.1	30.1

* Manufacturing census data of E.P.B. (1983)

** Establishment census data of E.P.B. (1981)

Table 3. Inner City, Songdong-ku, Manufacturing Share in Seoul.

	Establishment %	Employment %
more 5 persons		
3 manufacturing	13.4	13.7
33 wood products	19.8	19.6
38 metal products, machinery	18.2	19.1
more 1 person		
3 manufacturing	10.0	11.2
324 footwear	10.0	22.0
33 wood products	11.2	14.6
332 furniture	13.2	16.9
356 plastic products	15.3	15.7
362 glass, glass products	15.7	18.8
38 metal products, machinery	13.1	15.0
383 electrical machinery	16.9	19.4

two, the concentration on the core is more expected. The census data also shows that about 900 printing and publishing establishments were increased in Seoul from 1973 to 1983. Of those, 324 establishments or about 36% was increased in Chung-ku. In terms of the number of employees, a total of 13,881 people were increased in

7) Three Development Zones include dispersal zone, status-quo zone, and inducement zone.

Table 4. Number of Establishment and Employment of Printing and Publishing Industries in Seoul

	Chung-ku		Seoul	
	Establishment	Employment	Establishment	Employment
1973	296	8,802	709	31,248
1977	278	11,129	859	40,023
1980	396	10,604	1,015	39,571
1983	620	11,423	1,611	45,135

Source; Manufacturing census data of E.P.B (1973~1983)

Table 5. Percentage Distribution by Migration Origins of Plant(from where)

from	to	core area	Inner city
core area		64.2	11.9
inner city		21.4	50.0(26.0)
outer city		—	16.7
inner suburb		—	7.1
outer suburb		—	—
out of Greater Seoul		14.4	14.3
Total		100.0	100.0

(), Songdong-ku

Source; own data from the questionnaire.

Seoul from 1973 to 1983, of which 2,621 employees or about 19% was increased in Chung-ku.

In conclusion, it has been proved that the increased employment is not very conspicuous, but the increase in small-scale establishments is very remarkable in Chung-ku.

4. Openings, Closures and Relocations of Plant

In order to understand the locational behavior of plants, the number of births and deaths is collected from the Register. The birth of a plant here has a concept including new-born, altered ownership, in situ expansion, changing the products, and in-migration. On the contrary, the death of a plant includes five categories: (1) com-

plete closure with no successors, (2) substantial change in name (altered ownership), (3) changing its products (change from one category to another), (4) out-migration, (5) in situ contraction.

The Register has no such detailed information. It only provides the number of annual registrations, closures and relocations. The data on the number of closures and relocations is available only after 1979. Our questionnaires compensated the insufficient data to a certain extent.

The birth of plants in Chung-ku and Songdong-ku has continuously increased in number since the 1960's when an economic development plan was first started until the 1970's when there was an economic boom. But, with the year of 1978 as a peak, the number of birth fell sharply thereafter. Owing to the Industrial Location Act enacted in 1978 and the government's policy to control overpopulation, new plant registrations have almost stopped in Chung-ku and Songdong-ku since 1979. In 1978 when there were many new registrations, 114 plants registered in Chung-ku and 232 in Songdong-ku.

Of all the plants registered since 1960, 70% in Chung-ku and 69.4% in Songdong-ku were registered during the period between 1974 and 1978. According to the questionnaires, 56% of the plants surveyed, whether in Chung-ku or in Songdong-ku, were transferred from the previous owners, or simply changed the type of industry at the same site, and then registered. The remaining 44% were newly built. There is little difference in this respect between the core area and the inner city. But, there is a great difference between the two in the origins of in-migration and the careers of the factory owners. 64% of the respondents from the establishments located in the core had experience in a business related to the present one at the same core area, whereas, in addition to business experience in the same inner city (26% of Songdong-ku, 24% of the

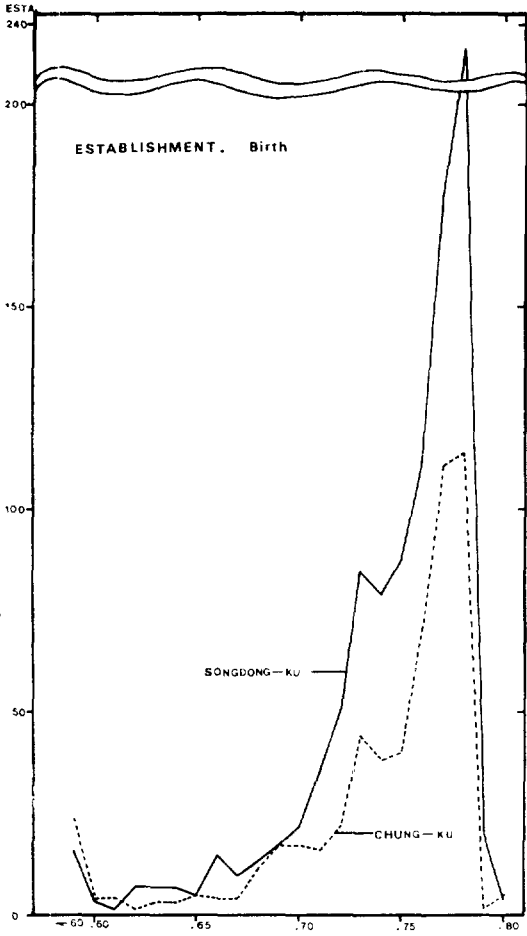


Fig. 4. Number of Plant Birth

inner city except Songdong-ku), about 12% of the respondents in Songdong-ku had experience related to the present one in the core area, about 16.7% in the outer city of Seoul, and about 14% in provincial cities outside of Greater Seoul.

Consequently, an absolute majority had engaged in a related business and in-migrated from the other sites within the same circle.

What is very noteworthy here is that the establishments in the core area moved within a narrow space, while those in the inner city moved from far wider areas.

What kind of business did they do in the previous locations? They were engaged in various

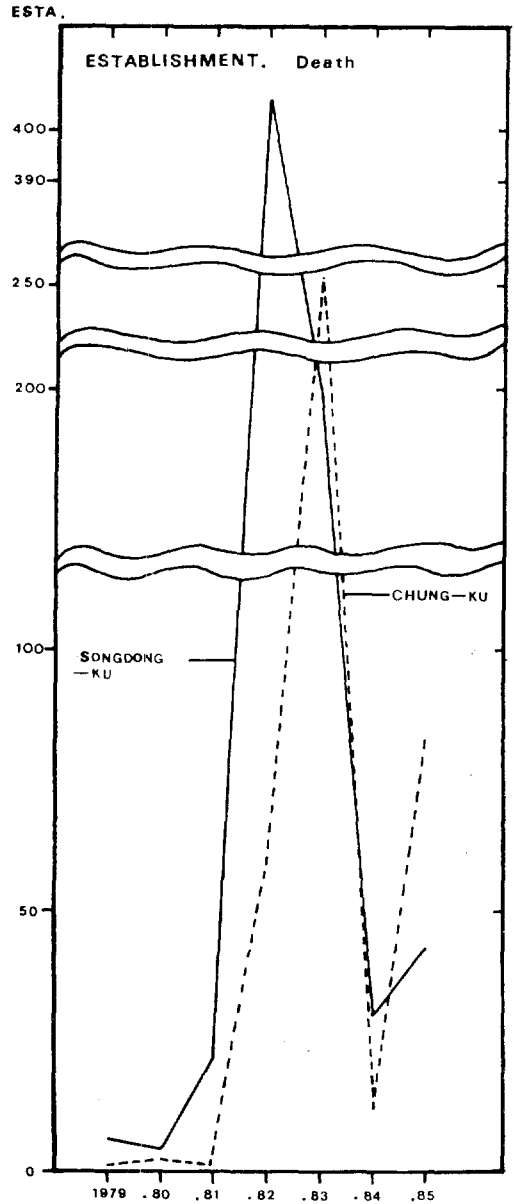


Fig. 5. Number of Plant Death

fields such as manufacturing in the same business type, or making spare parts, or repair, delivery of goods, and sales in the same business type.

But, in the case of Chung-ku, there are many cases where respondents changed their business from repairing, delivering and selling to manufacturing, and in the case of Songdong-ku, there are many cases where respondents were engaged

in manufacturing in the same business type, or spare parts manufacturing.

452 plants deaths have occurred in Chung-ku since 1979, 55 of them actually migrating to different sites. 773 plant deaths have occurred in Songdong-ku, 63 of them migrating to different locations. Entries of a change of holders through transfer or changes in business type cannot be understood, but it can be seen that the largest number of establishments closed their business or migrated to other locations during the 1982-1983 period when various restrictions on industrial location gained practical results. And it cannot be said that the number of closed plants has nothing to do with this period which was the bottom of the recession in the Korean economy.

Table 6 shows how many plant closures have relations to zoning. While almost all the plants in the core area, Chung-ku, are disobedient to the zoning, 357 of 773 deaths in Songdong-ku have nothing to do with zoning.

The viability is the balance of subtracting the closure year from the open year. If a plant is located in the favorable location, its life will be long. Otherwise, its life will be short. The average viability of both Chung-ku and Songdong-ku is 4~6 years, representing 40~66% of the total closures, and 78~90% if the 10-year viability is included. The characteristics of Chung-ku and Songdong-ku are that 40% of the

Table 6. Number of Plant Closures and Zoning

Zoning	Location	Chung-ku	Songdong-ku
Violation			
	Residential Area	384	391
	Commercial Area	66	10
	Others	2	15
No relation		—	357
Total		452	773

Number of Closures; Including the number of re-location plants.

Source; Register of Manufacturing Establishment (unpublished)

Table 7. Percentage Distribution of Migration Destination Since 1979(to where)

to \ from	core area	inner city
Core area	1(1.8)	—
Inner city	41(74.5)	—
Outer city	10(18.1)	7(11.1)*
Inner city	3(5.5)	40(63.5)**
Outer Suburb	—	—
Out of Greatr Seoul	—	16(25.4)
Total	55(100.0)	67(100.0)

* Guro-ku, **Ansan and Seongnam

Source; Register of Manufacturing Establishment (unpublished)

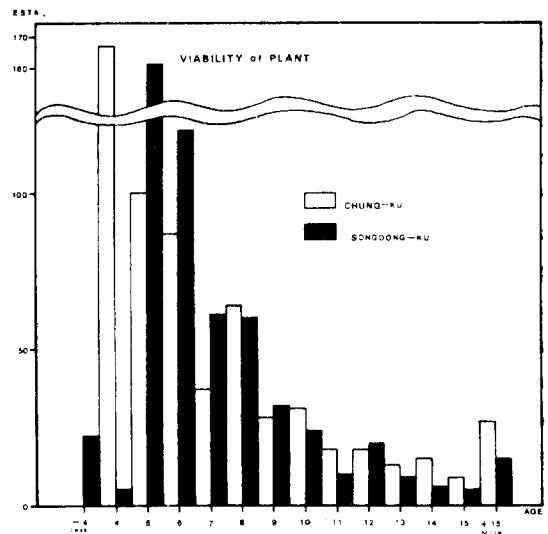


Fig. 6. Viability of Plant in the Core and the Inner Area of Seoul

total closures in Chung-ku were made within 6 years and 78% within 10 years, whereas 66% of the total closures in Songdong-ku were made within 6 years and 90% within 10 years.

As a result, the viability of the plants in the inner city including Songdong-ku is weaker than those in the core area. Figuratively speaking, the soil for birth and breeding in the core area, as small-scale businesses are concerned, is more fertile than that of the surrounding inner city. The author thinks this is related to the incubator

hypothesis mentioned later.

Now, taking a look at the cases of physical relocation, namely, migration among the closures, the number of migrated plants was 55 from Chung-ku and 63 from Songdong-ku, which was quite small, compared with the total closures. This indicates that the rapid growth of the manufacturing industry in the inner suburb or outer suburb doesn't result actually from the physical relocation of plants from the core area and the inner city⁸⁾. Where did the plants separated from Chung-ku and Songdong-ku go? Figure 7 shows very different results according to the migration origins.

Summarizing it briefly, many plants of Chung-ku were relocated mainly within the inner city including Songdong-ku and Yongsan-ku, the outer city including Yondungpo-ku and Kuro-ku, and Panwol(Ansan), newly industrialized city. On the other hand, except those plants in Songdong-ku which migrated to Kuro-ku, the largest number of plants is out-migrated to Panwol (Ansan) and Songnam, planned industrial estates, and not a few in provinces outside Greater Seoul. After all, the difference between Chung-ku and Songdong-ku is that the plants in Chung-ku, in many cases, are relocated within Seoul city, while those in Songdong-ku are relocated over a long distance. This is well matched with the characteristics that were introduced from the survey on the previous locations of the managers of the plants currently in operation.

In other words, it corresponds well to the fact that plant managers in Chung-ku in-migrated from not too long a distance, whereas plant managers in Songdong-ku in-migrated from a relatively long distance.

In conclusion, the locational dynamics of manufacturing industries of the core area, Chung-ku

and the inner city, Songdong-ku of Greater Seoul are summarized as follows.

(1) In spite of various restriction measures, small-scale printing, publishing and clothing industries have a strong preference for the center of the urban area.

(2) Many of the plant births appeared during the economic boom in the 1970's with 1978 as a peak, and a remarkable increase in death resulted from the recession after the second oil crisis in 1979 and rigid restrictions on building new plants in the capital city of Seoul.

(3) Assuming that the period between birth and death is viability, the largest number of establishments in Chung-ku and Songdong-ku has a viability of 4~6 years. But, the viability of the plants in the core area is stronger than those in the inner city.

(4) Among the births and deaths, the number of establishments born through relocations and migrations is not very large. This means that the industrial growth in the inner suburb of Greater Seoul is not necessarily the result of pushing the plants located within the city to migrate. The relocation pattern of the plants located in Chung-ku and Songdong-ku is very different. In terms of migration origin, many plants in Chung-ku were relocated mostly from the same core area or the neighboring inner city. In terms of migration destination, many plants are indeed relocated to the inner city and the outer city including Kuro-ku, characterizing the migration of a short distance from the core of Seoul.

On the contrary, the plants in Songdong-ku in-migrated from diverse origins including the same inner city, the core area, outer city, inner suburb and provincial cities. Destinations include Ansan, Songnam, newly developing towns, and

8) Scott, A.J., 1982, op. cit., p.122. Only about 2 percent of all private sector employment change in United States can be accounted for by physical relocation of plant.

provincial cities representing long distance migrations.

Accordingly, in terms of relocation destinations, the plants in Chung-ku are relocated freely and individually, while the plants in Songdong-ku are relocated intentionally to a specifically planned industrial estate.

5. Incubator Hypothesis: Case of Seoul

(1) Conflicting Evidence

The behavior of industrial locations in the core area and inner city suggests several questions. If there is a strong preference for the center of a large city in spite of various restrictions, and if the origins of the plants located in the core area and the relocation destinations since 1979 are within a short distance, what kind of power caused such a result? If the plants located in the core area, Chung-ku, are decentralized to the inner city, and the plants located in the inner city, Songdong-ku, are decentralized to the outer city, suburb, or provincial cities, wouldn't there be certain steps for the decentralization? What is the power leading to the decentralization? After all, it boils down to a preference for the core area and its surroundings (decentralization). The attempts to explain the phenomena as a long-run trend are classified into four main categories: (1) incubator hypothesis (2) theory of product cycle (3) hierarchical filtering theory (4) Hecksler-Ohlin hypothesis.

This study will deal with whether the phenomena of clustering in the core and decentralizing outward can be successfully explained in terms of the incubator hypothesis. E.M. Hoover and R. Vernon, as they analyzed the industrial location of New York, took interest in the hypothesis for

the first time⁹⁾, which was made from the idea that the core area of a big city acts as a seed bed for an immature firm, and that many of the small new firms will grow there and finally take up new locations in the suburb.

In connection with this hypothesis, a lot of examination cases were released, though with largely inconclusive or negative results. In the result of the examination of five SMSA in the United States made by R.A. Leone and R. Struyk, they assert that newly-born plants out-migrate more easily and are likely to be born in the outer city and that the births of new plants and their growth and development over time contribute little to the growing disparities between the inner city and suburban employment opportunities¹⁰⁾.

J.J. Fagg who studied Greater Leicester of England asserted that the same hypothesis can be applied to the mechanical industry and clothing industry, that the industrial seed bed is the place where the birth rate of plants is high in the core of a big city and in old industrial villages, and that this is due to cheap premises of stocks¹¹⁾.

G.C. Cameron, who studied Clydeside Conurbation of England as a case, concluded that the farther a plant is located from the core area of a city, the higher the birth rate of plants becomes, and he finally refuted the hypothesis¹²⁾.

B.M. Nicholson and A.W. Evans, who studied, using London as a case, the role of the inner city in the development of the manufacturing industry, adhered to a negative view as to the inner city functioning as an incubator of a new industry, and arrived at the conclusion, through interview data, that the printing and clothing industries have a strong preference for the core

9) Hoover, E.M. & Vernon, R., 1959, *Anatomy of Metropolis*, Cambridge, Mass. Harvard Univ. Press.

10) Leone, R.A., & Struyk, R., 1976, *op. cit.*, p. 330.

11) Fagg, J.J., 1980, *op. cit.*, pp. 35-44.

12) Cammeron, G.C., 1973, *op. cit.*, p. 143.

area, but that is due to the access to the market¹³.

Besides, G.P.F. Steed and A.J. Scott, who analyzed the inner city decline, using many cities in Canada as cases, have a negative view on the incubator hypothesis as a result of testing the Hecksher-Ohlin Hypothesis. According to Steed, there is a clear positive relationship between the degree to which clothing plants in Montreal and Toronto produce standardized outputs, and the distance at which plants are located away from the city center¹⁴.

Scott also used Montreal, Toronto and Vancouver as cases and examined the corelationship or two sets of variables: (1) the change in the ratio of central city output to total metropolitan output, (2) the percentage change in the estimated overall metropolitan capital labor ratio.

After all, he arrived at the following conclusion: Labor intensive firms at the core of the city will cluster densely together and at the same time, adopt intensive land use strategies while dispersed capital intensive plant at the edge of the city will adopt extensive land use strategies. As firms decentralize, so the statistical curves representing the relationship between manufacturing density and distance from the center becomes increasingly flatter¹⁵

Except for the study by J.J. Fagg, the validity of the incubator hypothesis is generally denied or only partially recognized. For the hypothesis to be examined completely, the following several facts must be confirmed realistically. First, do small-scale plants indeed strongly cluster and orient toward the core of a city? Second, Is the preference for the city center because there are managerial advantages in the core area in order to overcome small-scale capitals? Are the advan-

tages like renting old premises, supplying various kinds of services, supplying cheap and high quality labor, convenience for sales, and prompt personal contacts indeed to be enjoyed in the core area? Third, if a firm which has been grown into a certain scale in the incubation site, and doesn't need the services offered by the city center any more, does the firm indeed look for more space for decentralization in the outer ring where the rental is lower? In short, the three questions concern centrality, external economies and relocation of manufacturing industries. No study has made a complete examination so far, but employment growth and the rate of new plants between the inner city and the outer city have been compared only on the basis of aggregate statistical data.

Since the incubator hypothesis was established on the basis of a small-scale capital, the behavior of a small-scale plant must be noticed. To do that, the growth or share of establishment instead of employment must be analyzed. Next, whether the small-scale establishments enjoy various external economies mentioned earlier in the city center must be verified. As far as the latter is concerned, we have no choice but to depend on the data gained from interviews and questionnaires. The study by B.M. Nicholson and A.W. Evans was conducted using such data.

Finally, whether a business located in the center indeed grows and then is relocated in the outer city must be examined. This is a question of confirming the life of a business, that is, the life cycle, and also to confirm it, a long-term record must be examined thoroughly and then analyzed. This is almost an impossible task. The reason is that moreover, a small-scale business preferring the city center is a single

13) Nicholson, B.M., Brinkley, I., & Evans, A.W., 1981, op. cit., pp.57-71.

14) Steed, G.P.E. 1976, "Standardization, Scale, Incubation, and Inertia; Motreal and Toronto Clothing Industries," Canadian Geographer, Vol. 20, pp.289-309.

15) Scott, A.J., 1982, op. cit., p.132.

plant firm in most cases, not a subsidiary or branch plant of a big business, and it has characteristics of ready mobility, easy entry and frequent exit and the economic system soon adopts these plants operating in newly advantageous locations, while rejecting those operating under more adverse conditions.

(2) Available Data

With regard to the first question, the centrality of industries, the numbers of establishments, and employees are compared by ring, by sector and by year on the basis of census statistics. In addition, the births and deaths were compared by year through the Register of Manufacturing Establishments applicable to Chung-ku, the core area and Songdong-ku, the inner city. But, one thing that was desired in the data was that the births and deaths of plants could not be classified and totalized by case and this was complemented to a certain extent by the enquete survey.

To solve the second question, what advantages are enjoyed along with the external economies in the city center, the following questions were prepared.

- * Is your establishment a single plant firm, or a contracting or a branch plant?
- * How many firms do you do business with (by order for buying and by order for selling)?
- * Why did you prefer this site?

The obtainable locational advantages here are:

(1) Those related to the market (2) to the labor force (3) to the premises including land and building (4) to various services including financial and governmental services (5) to the linkage effects (6) to the traffic facilities (7) to raw materials, energy and water (8) others

If the city center functions undoubtedly as an incubator, the preference for (3), (4) and (5) will be strong. For, the most important things that the city center offers are that old premises can be easily rented and that various external

economies can be enjoyed. Whether a plant is single-storied, multi-storied, a common building, or a building for the exclusive use of a plant is a supplementary question to the preference for old premises.

The questionnaire for the third question, relocation, or decentralization, is composed of the following items.

- * Where did you do business before settling at the present site?
- * When was the year of establishment, and what was the zoning at the time of establishment?
- * Was it a new plant opening or an in-migration?
- * Do you want a relocation at present or in the future?
- * If you do, what is the reason and where do you want to migrate?
- * How far from the city center do you want to migrate?

(3) Result of the Study

1) The First Question

With regard to the preference for the city center, the number of plants in Chung-ku has been increasing as discussed in the previous chapter in spite of the application of the strict Urban Planning Act. The number of new plant registrations has also been increasing each year with 1978 as a peak. The printing, publishing and clothing industries occupy a considerable weight in the city center.

Since the building of new plants has been banned by law from 1978, there has been no registration of a new plant in the Register. However, because there are cases of entries of a change of holders or of products under a changed plant name, it cannot be said that there has been no birth since 1979.

According to the results gained from the enquete survey, 30 of the 71 respondents, or 40% of the total said that their plants were born after 1980 in spite of the Act prohibiting the building of

new plants. 32 respondents said that their plants were established during the late 1970's, which matches well with a remarkable increase in birth during the economic boom as shown in the Register. As we can confirm in the enquet survey what we cannot find in the Register about the cases including the entries of a change of holders or of products, this means that there have been new-born plants in Chung-ku even since 1980. This fact is also confirmed in the inner city, Songdong-ku which is farther removed from the center than the core area. 22 of the 118 available respondents or 18% of the total said that their plants were established after 1980. This isn't confirmed, either, from such data as the Register. Here, we must take note of the fact that there have been less births in the inner city after 1980 than in the core area.

In conclusion, it has become clear that in terms of non-census data, unlike the census data, the city center is not an unfavorable location, but a favorable location for small-scale plants.

2) The Second Question

For the second question, we will take a look at the locational advantages that are enjoyed in the city center. We asked them to choose five items of the 13 locational advantages that contributed greatly to deciding the present sites. And the largest number pointed out four items. 8 items of the locational advantages regrouped from 13 items are shown in Table 8. The striking phenomenon in the Table is that the preference for three advantages, service accessibility, available transport and linkage to other firms, followed by market accessibility is most conspicuous in Chung-ku, the core area of Greater Seoul. Only 10% of the total respondents, less than the author had expected, said that they chose Chung-ku because of many old premises.

Judging from the responses, the preference for external economies, 18.1% for linkage to other firms, and 21.2% for service accessibility,

Table 8. Score of Locational Preferences Gained from the Questionnaire

	Score	
	Chung-ku	Songdong-ku
1. Market	37 14.3	27 5.3
2. Labour	24 9.3	72 14.4
3. Premises	28 10.8	83 16.6
4. Linkage	47 18.1	50 10.0
5. Service	55 21.2	95 19.0
6. Transportation	55 21.2	95 19.0
7. M.E.W.	13 5.1	72 14.4
8. Others	• •	7 1.3
TOTAL	259 100.0	501 100.0

M.E.W.; raw materials, energy, water
Score; available response

amounts to 39.3% and the preference for old premises to 10.8%. Therefore, the reason for choosing the core of a big city by industrial managers is that 50% want to get the advantages related to the incubator hypothesis, and the other 50% want to pursue other advantages, which include transport facilities, market accessibility and available labor. What is noteworthy here is that more than half of those who preferred service accessibility considered personal contact very important, but, did not think much of contacts with administrative and financial organizations.

About half of the 71 respondents in Chung-ku manage their establishments as a single plant firm, and the other half as a contracting or subcontracting firm. The establishments they do business with are located within a short distance. The total number of establishments they have business relations with to sell their services is 783, 79% of which are located within Chung-ku, 10.8% of which within Seoul excluding the core area, and 10.2% of which are located in locations other than Seoul.

Conversely, the number of establishments they have business relations with to buy their services is 402, 75.8% of which are located within the

care area, 20.4% of which within Seoul and the remaining 3.8% of which are located in locations other than Seoul.

One difference the plants in Songdong-ku have in comparison with those in Chung-ku in answering the question, what kind of locational advantages they prefer, is that the respondents in Songdong-ku have a relatively low preference for market accessibility and linkage effect, while they have a relatively high preference for old premises, raw materials and energy. The fact that they have a higher preference than those in the core area attests to the argument that an industrial area with a comparatively long history can serve as a seed bed of industry even if it is not in the core area near CBD.

However, the important conclusion made from the questionnaire as can be confirmed in Table 8, is that variables that have nothing to do with the incubator hypothesis account for more than 50% of the total responses in Songdong-ku as well. Unlike Chung-ku, 68% of the total respondents of Songdong-ku run a single plant firm and the number of branch plants and contracting plants is not large. Moreover, as these firms have larger areas of business than those operating in

the core area, sales of service in the same area account for 39% of the total, those in Seoul excluding the same area account for 37% of the total and the other areas account for the rest. Business dealings are conducted in an extensive area when compared with Chung-ku.

On the other hand, the purchase of service from other companies in the same area accounts for 41% of the total and that from other companies in Seoul except for the same area accounts for 48% of the total, and that from companies outside Seoul accounts for the rest, surpassing Chung-ku in terms of the scope of its business dealings. In short, the conclusion made from the second question so far is summed up as follows.

(1) The reason that the printing, publishing, and clothing industries are concentrated in the core area of the city is that not only the incentives related to incubation, but market accessibility and transport facilities play a major role.

(2) The activity area for the plants in the core is, in general, limited to the immediate vicinity. This indicates the market pulling of the core area has had a great influence upon the clustering of plants.

(3) The preference for old premises that has

Table 9. Distribution of Business Connections (from Questionnaire data)

Selling-Buying	Chung-ku		Songdong-ku	
	N. of Establishment	%	N. of Establishment	%
Service Selling				
(A) to the same Ku	... 619	79.0	... 677	39.4
(B) to Seoul excluding (A)	... 85	10.9	... 644	37.5
(C) to out of Seoul	... 79	10.1	... 396	23.1
Total	783	100.0	1,717	100.0
Service Buying				
(A) from the same Ku	... 305	75.9	... 466	41.2
(B) from Seoul excluding(A)	... 82	20.3	... 545	48.1
(C) from out of Seoul	... 15	3.8	... 120	10.7
Total	402	100.0	1,131	100.0

available response; Chung-ku - 71

Songdong-ku - 127

been considered a condition for the incubator hypothesis is a phenomenon that is highly visible in the old industrial sectors of the inner city rather in the core area.

3) The Third Question

The third question has to do with the relocation of a plant. A couple of conclusions were drawn on this, based on the data in the Register of Manufacturing Establishments. That is, compared to the total number of deaths of plants, the number of plants that were relocated in effect is only a few. And, the plants that are operating in Chung-ku tend to be relocated in the nearby inner city (mainly Songdon-ku or Yongsan-ku) and outer city (mainly Yongdungpo-ku or Kuro-ku). The plants that are set up in Songdong-ku are usually relocated in the satellite cities within the boundary of Greater Seoul and the provincial cities. The majority of the plants in the core area are relocated in their vicinity, while those in the inner city are relocated in the far locations.

We have processed the data obtained from the questionnaire to confirm the conclusion reached. First of all, no more than 18.3% of the 70 respondents available to the questionnaire said that they wanted to relocate their plants. And 50% of the total respondents wanted to do so in the future. 31.2% of the respondents showed no interest in relocating their plants. Those who were not in favor of relocation were mostly printers and publishers. And many machinery and clothing manufactures responded they would seek other places to set up new plants in the future. Table 10 shows the locations of the future plants that are hoped to be set up.

This table is similar to the conclusion made on the basis of the Register of Manufacturing Establishments (Figure 7). The manufacturers with plants in Chung-ku want to relocate their plants either within the area of Chung-ku or in the inner city that includes Songdong-ku or in

Table 10. Preferable Out-migration Destinations
(Available Responses)

Ring	Chung-ku	Songdong-ku
Core Area	16	.
Inner City	5	20
Outer City	24	5
Inner Suburb	4	30
Outer Suburb	.	4
Out of G.S.	.	.
Total	49	39

Source; from Questionnaire
G.S.; Greater Seoul

Table 11. Preferable Out-migration Distance
(Available Responses)

Distance from Civic Center	Chung-ku	Songdong-ku
~ 5km	35	18
5~10km	17	32
10~20km	6	42
20~ km	4	9
Total	62	101

Source; from Questionnaire

the outer city that includes Yongdungpo-ku and Kuro-ku rather leaving Seooul city itself. On the contrary, manufacturers with plants in Songdong-ku hope, in a large measure, to migrate to the inner city that comprises Songdong-ku and to the inner suburb outside Seoul. It may be said that the conclusion of the previous chapter was reaffirmed that the plants operating in Chung-ku wish to be relocated in the vicinity and those in Songdong-ku wish to be relocated in the distant locations.

By what distance do these plants want themselves to be separated from the city center? The inner city of Seoul covers the area within a radius of 5km from the city center. The boundary of the outer city roughly coincides with that of Seoul within a radius of 15km from the city center. And the inner suburb, including satellite cities covers 15~40km areas from the city center. Plants in Chung-ku seldom, if ever, want to be

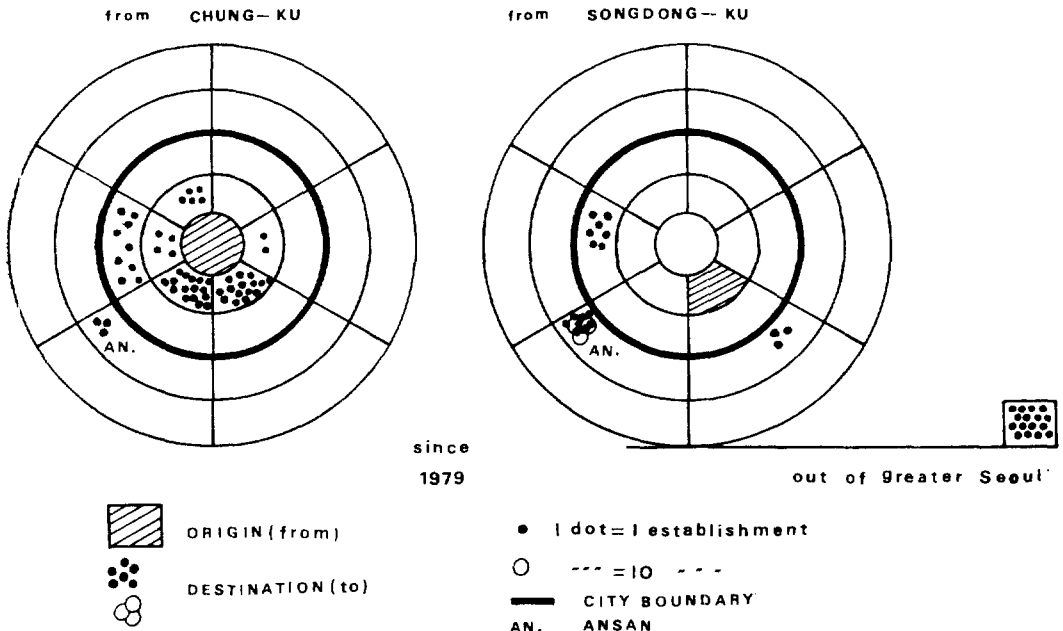


Fig. 7. Migration Destination of Plants

relocated beyond a radius of 15km from the center and those operating in Songdong-ku prefer the area 15—50km from the city center most.

What will be the managerial difficulties expected at the present locations on the part of the manufacturers who want to relocate their plants in other locations? While the manufacturers with plants in Chung-ku anticipate small working space, high rental charge and traffic congestion, those in Songdong-ku anticipate difficulties in securing work force besides the small working space and high rental charge. In other words, small working space and high rental charges are the common factors behind the desire to migrate to the outer ring in both cases of Chung-ku and Songdong-ku.

The difference lies in the fact that they cite traffic congestion in Chung-ku and difficulties in acquiring work force in Songdong-ku respectively for the reason to migrate. The explanation for this is that the plants located in Chung-ku expect difficulties arising from the internal urban structure and those in Songdong-ku expect difficulties

that may arise from the industrial structure that requires highly skilled workers. Songdong-ku is known for specialization in furniture, wooden products, foot-wear, chemicals and machinery unlike Chung-ku that specializes in printing and clothes manufacturing.

In short, following conclusions are reached regarding the third question, the relocation of a plant.

(1) The number of plants that are relocated is not as large as it was thought, and the number of plants that want to migrate now is not large, either.

(2) Even when they want to migrate, the plants in Chung-ku want the relocation area within a radius of 15km from the civic center and those in Songdong-ku want the relocation area within a radius of 15 to 40km. And several steps can be anticipated in the event of plant relocation.

(3) The main reason for plant relocation is small working space, and high rental charge. This is the same as the one for decentralization

discussed in the incubator hypothesis. However, the incentives for decentralization can be different, depending on the times, the present locations of the plants, and especially economic fluctuations and policy directions.

6. Conclusions and Policy Implications

This study is to clearly explain the behavior of the industries in the inner part of Greater Seoul and to test the incubator hypothesis with the data such as census, Register of Manufacturing Establishments and responses to the questionnaire. Greater Seoul is divided, for the sake of convenience, into five rings: core area, inner city, outer city, inner suburb, and outer suburb. Chung-ku was cited as an example of the core area and Songdong-ku as an example of the inner city.

With regard to the changes in industrial locations in Greater Seoul for the past 10 years, the growth in the inner suburb is outstanding in terms of employment, especially in the south and west of Seoul city. Despite the numerous restrictions in the inner part of the city, the preference for clustering in the core is strong among the small printing, publishing and clothing industries.

Births and deaths of plants alternate so often that the viability span is 4 to 6 years mostly and the physical relocations don't take place as often as they are presumed. The births and the deaths of plants soared to the peak in 1978 and from 1982 to 1983 each. And the fluctuation is greatly affected by the economic situation, oil price changes and the Industrial Location Act. New births of plants continue in the core area and the inner city of Seoul despite the ban on the new construction of them that was imposed because the births of plants include entries of a change of holders and of the products.

These happen because the city center provides incentives for the clustering of industries in spite of the various restrictions. Approximately 50% of these incentives have to do with the incubator

hypothesis and the remaining 50% have to do with the market, labor and transportation. Especially, the claim that the location of a plant is determined by the pulling to old premises is not right in the case of Seoul.

The same answer came to the following questions. Where did the plants in Chung-ku and Songdong-ku migrate from? Where do these plants migrate and want to migrate to? What is the scope of buying and selling of the services generated by these plants? The answer is that the plants in Chung-ku migrate and business is done within a limited area, while business in Songdong-ku is done more extensively. Generally, the plants in Chung-ku want to migrate within a radius of 15km from the city center and those in Songdong-ku want to migrate within a radius of 15 to 50km from the city center. This implies that there are certain steps in plant relocations according to the kinds of production activities and the scale of the plant.

Just as in the human activities, no rigid theory or law applies to the reality perfectly. The incubator hypothesis that was examined in the industries of Seoul well demonstrates this fact. It is true that certain industries are inclined, by a large measure, toward the city center. But, that's not necessarily because of incentives related to incubator (seed bed).

If there is a strong preference for the core area of big cities on the part of the printing, publishing and clothing industries, a rigid zoning law needs to be reexamined and amended so that the industries may effectively link together and help one another. The government must make an effort to systematically set up medium and small industry complexes or industrial apartments, getting rid of the lingering industrial ghettos, while establishing an industrial urban community that combines the three functions in an ideal manner: residential function, production function and urban services function.

首都圈 內部の 工業立地動態

邢 基 柱*

「國文要約」

본 연구는 센서스資料, 工場登錄臺帳, 設問調査를 통해서 首都圈 內部地區에 立地한 工業의 行態를 밝힘과 동시에 都市 및 工業研究家들 사이에 論議되고 있는 incubator hypothesis를 檢證 하려는 것이다.

首都圈은 편의상 core area, inner city, outer city, inner suburb, outer suburb의 5개 同心圈으로 나누고, core area의 사례로서 中區, inner city의 사례로서 城東區를 택하였다.

지난 10年間 首都圈의 工業立地變動은 雇傭으로 볼때 inner suburb의 成長이 刮目되고, 특히 서울의 西쪽 方向과 南쪽 方向에의 成長이 현저하다.

그러나 서울시 內部에 각종 규제가 주어지고 있음에도 불구하고 영세적 印刷·出版業과 衣類 및 機械工業에 관한 限 아직도 都市中心部에의 凝集性向이 강하다. 工場의 發生(birth)과 消退(death)가 빈발하여 生存力(viability)은 4~6년이 가장 많고, 생각보다는 場所의 移動은 많지 않다.

工場의 birth는 1978년, death는 1982~83년을 頂點으로 急増하는데, 여기에는 景氣變動, 油類波動 및 工業配置法 施行令(1978년)의 영향을 크게 받고 있다. 工場의 birth에는 所有權變更, 生産品目變更이 포함되므로 서울의 core area나 inner city에의 新設은 禁止되어있더라도 birth는 계속되고 있는 셈이다. 이것은 都市의 中心部가 각종 규제에도 불구하고 工業凝集에 有利한 incentives를 제공하기 때문이다.

이들 incentives중에 incubator hypothesis와 관계되는 要因이 약 50%이고, 나머지 50%는 市場, 勞動, 交通에 관계되는 因子들이다. 특히, 工場의 立지가 낡은 不動產(old premises)의 低賃賃料에 pulling된다는 假說은 서울의 例에 전혀 맞지 않는다.

中區와 城東區에 立地한 工場들이 어디에서 移住하여 왔는가? 이곳에서 어디로 移住하여가며, 가기를 希望하는가? 이들이 주로 서서비스를 팔고 사는 地域範圍는 어디인가에 관한 의문에는 거의 同一한 答이 나왔다. 즉, 中區에 立地한 工場들은 좁은 범위에서 移入하고 移出하며, 去來도 좁은 범위에서 행하여지고 있는 반면에 城東區의 그것은 이 보다 넓은 범위에서 행하여지고 있다. 대체로 移動을 희망하는 범위는 前者가 都市中心部로부터 약 15km 범위, 後者가 이 보다 약간 遠距離 범위이고, 이것은 生産活動의 種類·規模에 따라 工場移動에 관한 限 몇 개의 段階가 있음을 보여 준다.

모든 人間의 行態가 그러하듯이 硬直한 理論이나 法則에 最適의 현실은 없다. 우리가 서울의 工業에서 검증한 incubator 假說이 이러한 사실을 잘 代辯하고 있기 때문이다. 몇가지 종류의 公業이 都市中心部에의 指向性이 강한 것은 사실이나 그것은 꼭 incubator(seed bed)와 관련된 incentives 때문만이 아니고, 현실적으로 移動(physical relocation)은 생각보다 그 수가 적을 뿐 아니라 移動에는 公業의 종류나 규모에 따라, 또는 景氣變動·政策 등 外生的 要因에 따라 몇 개의 段階가 있을 것이다. 물론, 이러한 사실은 보다 많은 事例研究를 통해서 검증되어야 한다.

印刷·出版·衣類·機械加工業이 大都市 core

area에 指向力이 강하다면 硬直한 地域制 施行을 再考·改編해서 이들을 集團化할 필요가 있다.¹⁾ 政府는 中小企業團地, 또는 아파아트工場(flatted factories)을 計劃的으로 건설하여 오랜 工業地가

ghettos化하는 길을 닦고, 동시에 居住·生産·都市 서어비스의 3個機能이 理想的으로 결합되는 工業的都市地域社會(industrial urban community)를 만드는 데에 力注해야 될 것이다.

1) 邢 基柱, 1985, “都市工業의 立地와 育成方案” 地理學研究, 第10輯(李廷冕博士 回甲紀念論文集), pp. 363~372.