URBANIZATION AND INTERREGIONAL MIGRATION PATTERNS : THE CASE OF KOREA*

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Introduction

During the pre-historic period, world population grew very slowly. The slow growth was attributed to hunger, disease and war. However, the productivity increase due to the agricultural and industrial revolutions, and the development of modern medicine have caused rapid increases in world population during the past few centuries. Today, according to the United Nations' estimates, population grows by 2.5 percent per annum in the developing nations, and by 1.3 percent/annum in industrialized countries.

South Korea's population grew from 21.5 million to 25.0 million, or by 16 percent in the 1955–1960 period. From 1960 to 1970, it grew from 25 million to 31.5 million, a 26 percent increase. And during the most recent decade, 1970–80, it grew from 31.5 million to 37.4 million, or 18 percent. The recent trend indicates annual population growth has been reduced almost to 1.5 percent per annum. This reduction represents a remarkable success of population policies in Korea.

Korea's rapid industrialization since 1965 has been coupled with a major movement of the population to the cities, especially to Seoul, the capital city. This urbanization process in Korea is shown in Table 1.

In 1955, 24.5 percent of the total population lived in metropolitan areas; the proportion steadily increased and 57.3 percent of total population were located in cities by 1980. A city in Korea is comparable to the Standard Metropolitan Statistical Area (SMSA) of the United States. The Korean city's administrative boundaries are expanded as economic and social interaction justify annexation of neighboring jurisdictions. The degree of urbanization in Korea today may be comparable to the latter period of the 1940's in the United States.

Interestingly enough, the concentration of population into the seven

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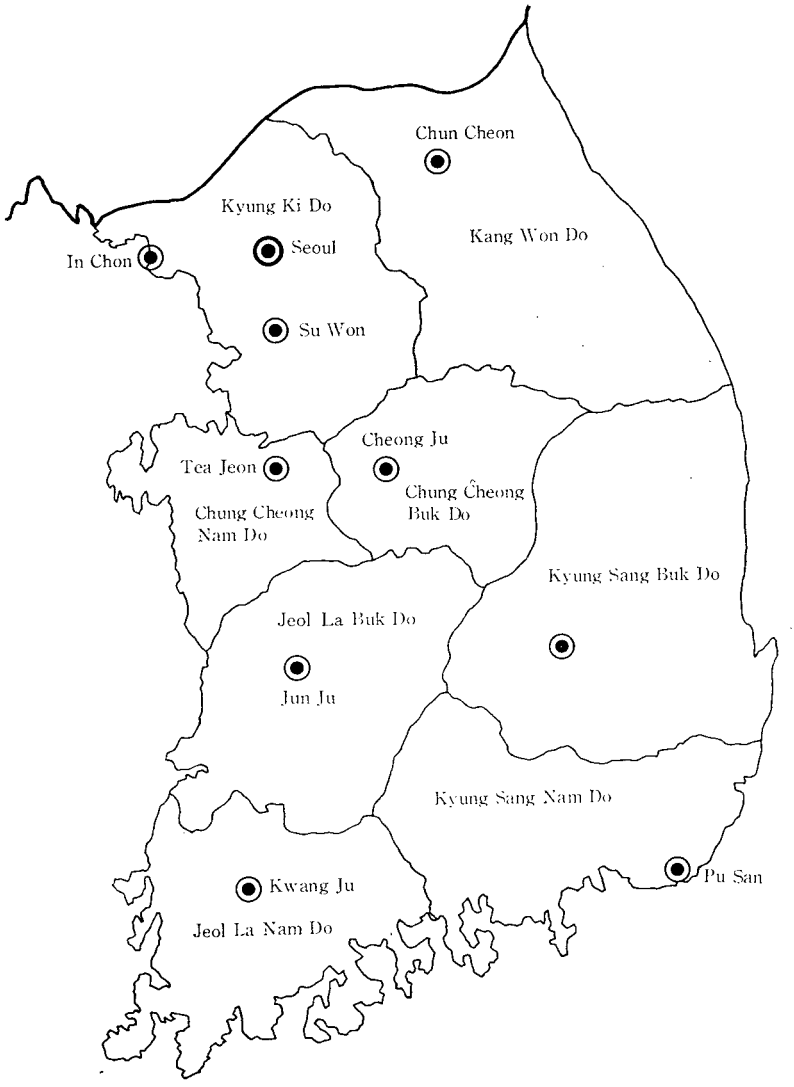
TABLE 1 TOTAL POPULATION, TOTAL POPULATION OF ALL METROPOLITAN AREAS, POPULATION OF SEVEN LARGEST METROPOLITAN AREAS (INTHOUSANDS); PERCENT SHARES, 1955–1980

	1955		1960		1966		1970		1975		1980	
		%		%		%		%		%		%
Total Population	21,526	100.0	24,989	100.0	29,192	100.0	31.469	100.0	34.679	100.0	37,419	100.0
Total Population of All Metropolitan Areas	5,281		6,997		9,805		12,929		16,794		21,441	
All Metro. pop./Total Population (%)		24.5		28.0		33.6		41.1		48.4		57.3
Total Population of 7 Largest Metro. Areas	3,964		5,418		7,547		10,327		12,879		15,966	
Pop. of 7 Largest Metro. Areas/All Metro. Pop. (%)		75.1		77.4		77.0		79.9		76.9		74.5
Seoul (Population) (% of All 7 Metro. Areas)	1,575	39.7	2,445	45.1	3,803	50.4	5,536	53.6	6,889	53.5	8,367	52.4
Pusan	1,047	26.5	1,164	21.5	1,430	18.9	1,881	18.2	2,454	19.1	3,160	19.8
Inchon	321	8.1	401	7.4	527	7.0	646	6.3	800	6.2	1,085	6.8
Taejun	173	4.4	229	4.2	316	4.2	415	4.0	507	3.9	652	4.1
Junjoo	124	3.1	188	3.5	221	2.9	263	2.5	311	2.4	367	2.3
Kwangjoo	233	5.9	314	5.8	402	5.3	503	4.9	607	4.7	728	4.6
Taegu	489	12.3	677	12.5	848	11.2	1,083	10.5	1,311	10.2	1,607	10.1
		100.0		100.0		100.0		100.0		100.0		100.0

Source: Economic Planning Board, Republic of Korea, *Korea Statistical Yearbook* (1955 through 1981).

PROVINCES AND METROPOLITAN AREAS OF KOREA



largest cities also followed the U.S. patterns from 1955 through 1975. In 1955, 75 percent of the entire metropolitan population in Korea was located in the seven largest cities; this percentage increased to 80 percent in 1970, when environmental issues were more intensively debated world-wide than ever before. Around that time, the Korean government also started giving serious consideration to metropolitan congestion and pollution problems. As a result of deliberate public policies, the population concen-

tration into the seven major cities started to slow down. Thus, in the 1970–80 period, the percentage of the metropolitan population in the 7 major cities decreased from 80 percent to 75 percent.

While Seoul's share of the total population of the seven largest cities continued to increase in the 1955-70 period, i.e., from 40 percent to 54 percent, the trend has reversed during the past decade. From 1970 to 1980, Seoul's share declined from 53.6 percent to 52.4 percent. This reversal can be attributed to movement of population from Seoul toward Inchon, which is Korea's largest port. At the same time, the population share of Pusan, the second largest city in Korea started to increase. One reason for this trend is the fact that Pusan maintains the largest port in Korea, which can accomodate large ocean vessels year round. Inchon has the disadvantage of a much larger change in tide levels. Another reason stems from the Korean attitude that a population of 3–4 million is the maximum acceptable from the environmental and social points of view; Seoul has exceeded this limit. However, the most important factor seems to be the deliberate policies of the Korean government to allocate economic activities in a more rational fashion by considering regional specialization, cost/benefit of economic efficiencies and long-term prices to be paid for environmental deterioration.

Urbanization and Industrialization

The overall urbanization process in Korea, especially the patterns of population concentration, is presented in a visual form in Figure 1. The moving forces behind the urbanization are industrialization, which has occurred mainly in large cities but also has been spreading gradually even to smaller cities. As Table 2 shows, in the relatively short period of 15 years, 1965–80, the change in the Korean industrial structure has been

TABLE 2 POPULATION, LABOR FORCE, AND EMPLOYMENT, KOREA, 1965–1980
(in thousands)

	1965		1970		1975		1980	
Total Population	28,754		31,469		34,707		37,449	
Population 14 Years and over	16,591		17,936		21,833		25,335	
Labor Force	9,199		10,020		12,340		14,454	
Persons Employed:	8,522	100.0%	9,574	100.0%	11,830	100.0%	13,706	100.0%
Agriculture & Forestry	5,000	58.7	4,834	50.5	5,425	45.9	4,658	34.0
Mining & Manufacturing	879	10.3	1,369	14.3	2,265	19.1	3,095	22.6
Construction	246	2.9	279	2.9	511	4.3	841	6.1
Other Industries	2,397	28.1	3,092	32.3	3,629	30.7	5,112	37.3

Source: Economic Planning Board, Republic of Korea, *Korea Statistical Yearbook* (1965 through 1981).

drastic. During this period, the primary sector, i.e., agriculture and forestry, declined from almost 60 percent of the total employment force in 1965 to 34 percent in 1980. On the other hand, the employment share in basic industry, such as mining and manufacturing, increased from 10 percent in 1965 to 23 percent by 1980. These basic industries have influenced other sectors such as construction and other infrastructure of the economy. The resulting rise in income in the large cities such as Seoul has stimulated the growth of various service type activities.

Table 3 shows differential degrees and paces of urbanization of different provinces. The reader must be cautioned by the figures for Seoul and Pusan. These two cities are actually large metropolitan areas in the U.S. sense. An interesting observation from this table can be made. The degrees of urbanization varied widely in early years. For example, while only 7 percent of the people in Chung Cheung Book Do lived in cities in 1955, 32 percent of total population in the same province live in cities now. Other provinces have experienced the same movement. This type of urbanization phenomenon has been observed also in the industrialized countires, including the United States. As people move out of rural, agricultural areas, the productivity there also improves due to a little more land to cultivate for those remaining there. People who are pulled into industries enjoy high wage rates. Thus, the Korean economy is also following the classical pattern of industrialization. In general terms, this equilibrating force follows the "laws of migration," as E.G. Ravenstein observed one century ago in England (7). In other words, people try to improve their lot by migration. Social and/or economic imbalances between localities generate attractive influences in the more "prosperous" place and dispersive influences in the less prosperous locality. This situation results in migration from the less prosperous to the more prosperous locality.

Interprovince Migration (Model)

Recently, much attention has been paid to the interrelationship of the three elements which Ravenstein identified as major factors causing interregional migration. These three elements are population size, distance, and forces of attraction and repulsion. Population size factor represents the number of persons able to move.

The second factor, distance, is significant because migration involves the economic/social costs of traversing between the source to destination locations. The third factor represents the attraction forces of the destination area and pushing forces in the source area.

There is little agreement regarding the functions relating migration with these factors and the way in which the force of attraction and/or repulsion should be measured. S.A. Stonffer hypothesized that the number of persons going a given distance is directly proportional to the number of oppor-

TABLE 3 TOTAL POPULATION, METROPOLITAN AREA POPULATION, BY PROVINCE IN KOREA, 1970–1980 (in thousands)

	1955			1960			1966		
	Total Pop. (1)	Metro. Pop. (2)	(2)/(1) %	Total Pop. (1)	Metro. Pop. (2)	(2)/(1) %	Total Pop. (1)	Metro. Pop. (2)	(2)/(1) %
National Total	21,526	5,281	24.5	24,989	6,997	28.0	29,193	9,805	33.6
Seoul	1,575	1,575	100.0	2,445	2,445	100.0	3,803	3,803	100.0
Pusan	1,049	1,049	100.0	1,164	1,164	100.0	1,430	1,430	100.0
Kyung Gi Do	2,364	403	17.0	2,749	492	17.9	3,108	730	23.5
Kagn Won Do	1,496	195	13.0	1,637	218	13.3	1,833	333	18.2
Chung Cheung Book Do	1,192	81	6.8	1,370	161	11.8	1,550	204	13.2
Chung Cheung Nam Do	2,223	173	7.8	2,528	229	9.1	2,905	387	13.3
Chul La Book Do	2,126	273	12.8	2,395	344	14.4	2,523	402	15.9
Chul La Nam Do	3,128	481	15.4	3,553	601	16.9	4,050	748	18.5
Kyung Sang Book Do	3,364	653	19.4	3,848	863	22.4	4,477	1,120	25.0
Kyung Sang Nam Do	2,721	337	12.4	3,018	411	13.6	3,176	559	17.6
Jeju Do	289	60	20.8	282	68	24.1	337	88	26.1
	1970			1975			1980		
National Total	31,435	12,929	41.1	34,707	16,792	48.4	37,449	21,441	57.3
Seoul	5,525	5,525	100.0	6,890	6,890	100.0	8,367	8,367	100.0
Pusan	1,876	1,876	100.0	2,453	2,453	100.0	3,160	3,160	100.0
Kyung Gi Do	3,353	908	27.1	4,039	1,649	40.8	4,935	2,380	48.2
Kang Won Do	1,865	382	20.5	1,862	417	22.4	1,792	579	32.3
Chung Cheung Book Do	1,480	231	15.6	1,522	298	19.6	1,424	452	31.7
Chung Cheung Nam Do	2,858	492	17.2	2,949	603	20.4	2,956	772	26.1
Chul La Book Do	2,432	461	19.0	2,456	583	23.7	2,288	678	29.6
Chul La Nam Do	4,005	884	22.1	3,984	1,039	26.1	3,779	1,225	32.4
Kyung Sang Book Do	4,556	1,390	30.5	4,859	1,716	35.3	4,962	2,288	46.1
Kyung Sang Nam Do	3,119	673	21.6	3,280	1,009	30.8	3,323	1,372	41.3
Jeju Do	365	106	29.0	412	135	32.8	463	168	36.3

Source: Economic Planning Board, Republic of Korea, *Korea Statistical Yearbook* (1955 through 1981).

tunities at that distance and inversely proportional to the distance and to the number of "intervening opportunities" between the origin and destination(9). Recently, W.J. Wadycki applied Stonffer's intervening opportunities hypothesis to interstate migration data (11). Gershon Feder has used Wadycki's procedure to measure "intervening opportunities" from the Korean data (which have limitations in the sense that the data were estimated by an individual on an ad hoc basis, not on an official, continuous basis.) Feder has used the data in testing the intervening opportunities hypothesis on 1974 interprovincial migration. The results have proved reasonably good(3). Although it is appealing to incorporate the concept of "intervening opportunities" in the migration model, the difficulty involved in measuring them, especially in the Korean context where regional data are extremely scarce, has led the authors of this paper to adopt a simpler, more practical model of interprovincial migration flow which is three fold: first, to identify major forces causing the migration flows among provinces; secondly, to compare migration flows between 1970 and 1980; and thirdly, to derive policy implications from the empirical results.

The classical view of interregional migration is that people migrate if they perceive they will be better off in the destination areas even after considering the monetary and emotional costs involved in migration. Yet, such a view is merely tautological unless the specific costs and benefits involved in the migration decision are identified. As Theodore R. Anderson (1) has classified, the costs and benefits factors postulated by Ravenstein (7) and elaborated since then by many authors may be grouped into two catagories: (a) those explained mainly through the "push-pull" theories (5),(6), (10), and (b) those through the gravitational theories (8), (12). The model of interprovincial migration flows presented below encompasses both these push-pull and gravitational factors.

The relative attractiveness of a province over other provinces is caused by numerous factors. Relatively abundant employment opportunities seem to be the most important factor in the migration decision. Korean industrialization is associated with a shift of labor force from the agricultural sector to secondary and tertiary sectors; industrialization brings about a rapid growth in the provinces in which the secondary and tertiary sectors grow rapidly, a fact which helps explain interprovince migration flow.

Secondly, a relatively industrialized province tends to enjoy a high income level and pay more for the same skills than less industrialized provinces do. The destination area for migrants thus tends to be the high income areas. The third important factor for migration flows among provinces is the relatively abundant and better facilities for higher education. This factor plays a particularly improtant role in Korea, where learning is highly valued in the Confucian tradition. If relatively more of the labor force is tied up in schools in an area, its labor market is likely to become tighter. Therefore, the relatively abundant opportunities for higher edu-

cation in a province will have a two-fold effect on migration: The direct inducement of young people to the area, and the instigation of more immigration due to a tighter labor market.

A relatively rapid natural increase (net of migration) of population in a source province represents a "pushing" factor. In other words, if an area's population grows faster than other areas, other things being equal, it tends to push people out of the area. Since less urbanized provinces maintain higher birth rates, the direction of interprovincial migration would presumably flow towards the more urbanized areas. The monetary and emotional costs involved in migration are responsible, at least partly, for the existing regional disparities despite various equalizing forces at work. The potential migrant's perception of the relative attractiveness of candidate destination areas and cultural differences are closely related to the distance from the present area (5). The more remote acandidate destination area is, the less likely it is that relatives and friends live there. Therfore, if other things are equal, distance (or time required to travel) between the source and destination areas represents a proxy for the cost factor in the migration decision.

The discussion above suggests three categories of factors causing interprovincial migration. The first category may be called attractiveness of destination province j relative to source province i, A_{ij}. A_{ij} is a vector of "attraction" variables of destination area$_j$ in relation to source area i, such as employment opportunities, relative income level, educational opportunities, and other metropolitan amenities. The second category represents the "pushing" influence of source province i which may be measured by its population size or its natural population growth rate, p_i. The third category is migration costs from source province i to destination province j. Distance between or travel hours between the two regions, D_{ij}, can be used to represent the cost factors. Therefore, the number of persons migrating from province i to province j, M_{ij}, can be described by:

$$M_{ij} = F(A_{ij}, p_i, D_{ij}),\ F_1 > 0,\ F_2 > 0,\ F_3 < 0$$

Here, F_v is the partial derivative of M_{ij} with respect to v-th argument, v = 1, 2, 3.

Empirical Results

Since we deal with directional, province-to-province migration flows between eleven provinces in Korea, there are 110 observations of M_{ij}, i.e., n(n-1) observations, where n = 11. Accordingly, various "independent" variables were arranged to match the observations of the dependent variable. We have estimated the model for 1970 and 1980, separately. We have also tried three specifications, namely, linear, semi-logarithmic, and

log-log forms. Both the linear and semi-logarithmic formulations have provided reasonable results in terms of signs and significance of the regression coefficient for each independent variable. However, regression coefficients have not been stable between 1970 and 1980. Morever, the coefficients of determination have been relatively low. Therefore, in the following, we present the estimation based on the log-log formulation.

As the table shows, the hypothesis stated in the preceding section is reasonably well supported by the model. It must be noted that the variable DVAL, as indicated in the table, represents changes in value-added in the mining and manufacturing sector in the destination province. We have also tried the changes in value-added per employee in the sector, together with the changes in employment. But the results did not turn out to be reasonable; the signs were counter-intuitive.

DEPENDENT VARIABLE: $AMGL_{ij}$

Independent Variable	1970		1980	
	Regression coefficient	F	Regression coefficient	F
Intercept	−5.663		−5.104	
$DVAL_j$	0.484	27.0	0.485	33.2
$DEDL_j$	0.678	28.5	0.308	3.3
$DTTL_{ij}$	−0.776	44.3	−0.722	44.7
$POPL_i$	1.087	142.2	1.155	203.1
R^2	0.817		0.823	

Here, $AMGL_{ij}$ = Natural log of migrants from province i to province j.
$DVAL_i$ = Natural log of change in value-added in mining + manufacturing sector in the destination province j.
$DEDL_j$ = Natural log of change in enrollment in colleges and universities in destination province j.
$DTTL_{ij}$ = Natural log of distance between province i and province j.
$POPL_j$ = Natural log of population in source province i.

In comparing 1970 and 1980, all the coefficients, except that for enrollment of colleges and universities, have been stable over time. The reduction of enrollment elasticity from 1970 to 1980 could be attributable to the government policy which gradually expanded higher educational opportunities throughout the country. Also, it is indicated that the distance elasticity has also declined slightly; this may be due to the improved transportation and communication during the decade.

An alternative formulation—still a log-log form—is presented below, which seems to be also reasonable. This time, the variable DEML; (employment changes) has replaced the variable $DVAL_j$ (changes in value-added).

This specification may reflect more correctly the situations in Korea than the preceding one, although the overall R^2 values are slightly lower

DEPENDENT VARIABLE: $AMEL_{ij}$

Independent Variable	1970		1980	
	Regression coefficient	F	Regression coefficient	F
Intercept	−4.453		−5.370	
$DEDL_j$	1.024	108.1	0.874	20.1
POPL	1.068	120.7	1.151	157.8
DTTL	−0.845	46.6	−0.681	31.2
DEML	0.165	10.8	0.088	3.3
R^2	0.792		0.774	

in this latter formulation. Both the educational elasticity and the distance elasticity have shown a decline during the past decade. A more significant structural change is indicated by a drastic reduction in the employment (in mining + manufacturing sector). This may be attributable to deliberate government policy which aims at allocating manufacturing activities in many provinces. For example, Masan City, which is endowed with a good port, has grown rapidly. Thus, it is now included as the eighth among the so-called largest cities.

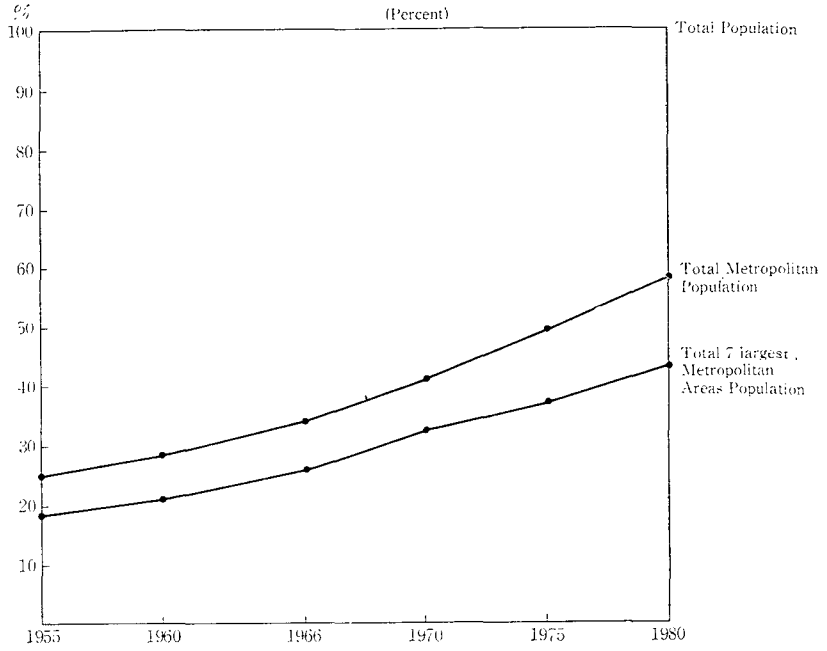
Implications

In formulation of an interregional migration model, no matter how theoretically appealing a formulation may be, the model may turn out to be of little practical use if the data are not available. The concept of "intervening opportunities" is ceratinly appealing, but as mentioned above, we have chosen a much simpler formulation, as presented in this paper, for the practical reason.

Our results suggest several important policy implications. First, the empirical results indicate the interprovincial migration flows are results of socio-economic changes among the provinces during the past decade. While intra-provincial migration represents mainly rural-to urban movement, inter-provincial migration reflects mainly urban-to urban movement. The "independent" variables responsible for the inter-provincial migration flow have been "urban" in character, for example, college enrollment changes and employment changes / value-added in manufacturing industries.

In addition, an improved transportation and communication system accompanied by the rpaid industrialization have contributed to active inter-provincial migration flow, since major transportation networks connect major population centers in Korea. The modernization of the transportation systems has resulted in a relative concentration of the population at a few major population centers, where the secondary and tertiary sectors' employment, and educational opportunities are much more

FIGURE 1 TOTAL POPULATION, METROPOLITAN POPULATION, AND POPULATION IN THE SEVEN LARGEST METROPOLITAN AREAS IN KOREA, 1955–1980



Source: Economic Planning Board, Republic of Korea, *Korea Statistical Yearbook* (1964 through 1981).

abundant. At these centers income levels are also substantially higher than in the medium-or small-size cities. Thus, a few large cities (metropolitan ar eas in the U.S. sense) have emerged as regional (umlti–provincial) centers.

The above mentioned phenomenon is nothing but the result of natural forces; all the participants in the society try to improve their own lots. The observed trend of accelerated concentration of population into large cities in Korea has been persistent. Contrary to a widespread view in Korea, this trend need not be viewed as harmful to the further development of either the largest cities, with the possible exception of Seoul, or the nation. The trend of population concentration is simply the reflection of achieving of "agglomeration" economies as Walter Isard (4), and Benjamin Chinitz (2) have pointed out. External economies of scale to firms in many industries constitute the downward shifts in average cost curves of each firm as many industries grow in one place. The inter-provincial migration in Korea follows a classical pattern of movement to areas of high productivity, high income, job opportunities and social amenities.

The major factors causing the Korean interprovincial migration are fortunately, controllable by the central government, if the policy makers possess a clear-cut long-term plan. Some policies of the govern-

ment have been already effectively implemented, such as the distribution of higher educational opportunities, and of industry according to appropriate location factors. The basic principle of government population policies can be compared to that of the Oriental martial arts such as *Karate* and Jujutsu; one should utilize the opponent's force to one's own advantage by changing the direction of the opponent's force slightly, instead of trying to change the direction by 180 degrees. Here lies the secret of the most beneficial population policies Korea must adopt.

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