A Study on the Characteristics of the Officially Assessed Land Price*

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표준지 공시지가의 가격특성에 관한 연구

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요약

공시지가 제도는 도입 이후 많은 변화를 겪으면서 공적 지가로서의 역할을 해 왔다. 그러나 기본적으로 시장가치 반영의 부족으로 실제 적용에서는 많은 논란이 제기되어 왔다. 그 이유는 공시지가를 결정하는 모형에 대한 검토들이 제대로 이루어지지 못하였기 때문이다. 최근에 제도적 개선에 대해서는 공감대가 형성되고 있으나 기존 제도를 완전히 대신하는 방법적으로 해를 찾기는 쉽지 않다. 기본적으로 공시지가가 공간적 가격차이를 반영할 수 있도록 모형적 검토가 이루어져야 할 것이다.

Keywords: Officially Assessed Land Price, Individually Assessed Officially Assessed Official Land Price, reference land,
공시지가, 개별공시지가, 표준지

1. Introduction

In a market economy, exchanges take place on the basis of prices determined in the market by the interaction of demand and supply. So the formation of prices is central to the functioning of the market, and prices are the signals which indicate changes in the conditions of demand and supply. In their return

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supply and demand adjust to these signals. But where markets are defective, price signals work at less than full efficiency, and adjustments in supply and demand are sluggish. In general 'real property' refers to a particular type of good – land or resources embodiedin land, and the point is that neither is physically movable. This physical characteristics of the real property makes its economic nature different from other economic goods. In a sense the real property market is essentially a defective market, and it means the real property market is not efficient in registering changes in demand and supply through their effect on price.

In addition relatively high costs of dealing, incurred either in obtaining knowledge or in the necessary legal procedures, restrict the extent to which a small price change can motivate adjustments to supply and demand. Furthermore, any limitation of the market localizes demand and supply, making it easier for imperfect competition to exist.

Where imperfect competition exists in the market, there is an even stronger case for government intervention. That is the case of the real property market. However we must not overemphasize the barriers in the real property market. This situation can be improved by making knowledge better or more readily available, and better knowledge can result from the more sophisticated methods of calculating values. The Public Notice of Land Price system is the one to deal with it.

The Public Notice of Land Price(PNLP) system was established in 1989 unifying reference land prices used separately by three government departments; the Ministry of Construction, the Ministry of Internal Affairs and the National Tax Agency. As such determined land prices are a public land prices used mainly for public purposes. Till then the public land prices were diversified, and as the agencies apply different criteria, the land price of the same location was assessed differently according to the objectives of the relevant agencies. And it was recognized that this resulted waste of manpower and excessive government expenditure, and a strong demand for an unified land price system was raised. Though the unification movement of land price system began in 1981 when the central government identified the need to unify appraisal system, the upsurge of land prices in the late 1980s brought a sudden establishment of a new system without deliberate review and research with regard to the essential concepts, survey criteria, survey method, etc..

To implement the new system the Public Notice of Values and Appraisal of Lands, Etc. Act was enacted in 1989. And since then all the public land price was determined by the procedure stipulated in the Act, and though in the meantime piecemeal amendments were continued, the fundamentals of the system were not changed.

Article 1 of the Public Notice of Values and Appraisal of Lands, Etc. Act defines its objectives as follows: to have a 'reasonable price' of land to be used for assessment of land through appraisal and public notification of the reasonable price of land; to help contribute to the formation of reasonable prices thereof by stipulating matters regarding the appraisal of lands, buildings and movables, etc.; to promote the efficient utilization of national lands and development of national economy.

In spite of stated objectives its achievement were not satisfactory. Moreover from the beginning the fact that land prices determined through the PNLP system – both the Officially Assessed Land Price and the Individually Assessed Official Land Price – does not fully reflect the market price or market value of the land in question was an obvious weakness to efficient functioning of the system and to the achievement of policy objectives.

Recently the need for the reform of the PNLP system is widely recognized, and both the public sector and the private sector are searching for a solution. A definite solution may not be possible, but this time is as good an opportunity to reach there. Especially IMF crisis accentuated the urgencies and accelerated the process.

First of all this paper reviews the theoretical methods with which the PNLP system is based. And then overviews the PNLP system. As is indicated earlier, its utility and viability as an indicator is under review on these days. And then examines the major issues showed up in the several researches and finally concludes with the likely future of this system.

2. The Determinants of Officially Assessed Land Price

The Officially Assessed Land Price is based on the estimation of the price of the reference lands by using the hedonic price function, and assumes a normal distribution of the lands irrespective of its use and urban planning aspects. So the system has its own limits.

Firstly, the appropriateness of the number of the reference lands is not verified. As the real estate market is more and more localizing, it is becoming more complicated to select representative lands. Moreover rapid legal change make it difficult to sustain the reference lands.

Secondly, though the system is based on the hedonic model, it has inherent problems. That is to the spatial effects in the estimation of real estate price. In the earlier studies, the price has been mainly estimated by using ordinary regression analysis. But the existence of spatial autocorrelation resulted distortion in the interpretation of the estimated value. Recently empirical studies show that statistical analysis which consider spatial effects is more

precise than other analysis which disregard spatial effects.

The application of the hedonic price technique to valuating land price requires a direct economic link between land characteristics and the affected land market. Till now much research has been carried to solve specific econometric issues pertaining to hedonic models. Major issues are functional form, identification, statistical efficiency and benefit estimation. The neglect of spatial considerations not only affects the magnitude of the estimates and their significance, but also lead to serious misinterpretation of the results.

There are two ways to incorporate spatial effects into a regression model. The spatial lag model which implicitly assumes that spatially weighted average of land prices in a neighborhood affects the price of each parcel in addition to the standard explanatory variables of land and neighborhood characteristics. the former is indirect effects, and the latter is direct effects. The spatial error model does not include indirect effects but is based on the assumption that there is one or more omitted variable in the hedonic price function and that omitted variable(s) vary spatially. Due to the spatial pattern in the omitted variables, the error term of the hedonic price function tends to be spatially autocorrelated.

Since the introduction of the system, much revision has been made, but fundamental reviews on the theoretical questions were not. This can be confirmed by reviewing the ONLP system itself. Next chapter will summarize the system, and certify that.

3. An outline of the Public Notice of Land Price system

According to the Act the Officially Assessed Land Price is determined each year and publicly noticed by the Ministry of Construction and Transportation(MOCT). The PNLP sysytem is largely composed of three main components; Officially Assessed Land Prices of the reference land; the comparative land price reference table; and the Individually Assessed Official Land Prices. Land prices as such determined serve as the indicator for ordinary transactions in lands, and where such an institution as the State or local authorities, etc. makes an assessment of land prices in connection with the discharge of their functions or where a property appraisal businessman – a certified public appraisers – conducts an appraisal of individual lands, serves as the benchmark for such assessment. So its influence upon the economy is considerable.

By following the stipulated procedures we could more fully understand the PNLP system. Let me first define the terms used here. The term 'the Officially Assessed Land Price' means the price of the reference land per unit area, which the Ministry of Construction

and Transportation has surveyed, assessed and made public in accordance with the procedure stipulated under the Act. And the term 'the reasonable price' means a price which is reasonably expected to be agreed on if voluntary transactions were conducted. Other terms will be explained following the procedure.

Though said the PNLP system is composed of three main components, the procedure which determines the publicly noticed land price proceeds through several steps. That can be:

1st step : selection and determination of the price of the reference land
2nd step : public notice of the price of the reference land
3rd step : perusal of officially assessed land price
4th step : application for objection to Officially Assessed Land Price(OALP)
5th step : determination and public notice of Individually Assessed Official Land Prices(IAOLP)
6th step : application for objection to Individually Assessed Official Land Price
7th step : application

Let's examine each step in more detail.

(1) selection and determination of the reasonable price of the reference land

The procedure starts with the selection of the reference lands and determination of its prices. The reference lands are selected from among a body of lands deemed generally similar thereto in terms of the land utilization circumstances or the surrounding environment or other natural and social conditions. And where the MOCT conducts a survey and assessment of the reasonable price of the reference land, he shall take into overall considerations such factors as the market price and the rent of a similar land adjacent thereto and the estimated costs to be incurred for the creation of a land which is deemed to have a use value equivalent to the land in question.

The total number of the reference lands is calculated by using following statistical model;

$$n = (Z^2 * C^2 / e^2) * [1 / \{ (1 - (1/N) + (1/N) * (Z^2 * C^2 / e^2) \}]$$

where,

n ; estimated number of the reference lands
Z ; the degree of confidence
C ; the coefficient of variation
e ; comparative degree of precision
N ; total number of the lands under survey

Table 3.1 the regional distribution of the reference lands(1999)

		no. of individeal lands	no. of reference lands	density of the reference lands
total		26.633.379(100.0)	449,925(100.0)	1.69
metropolitan areas	Seoul	968,431(3.64)	31,125(6.92)	3.21
	Busan	588,337(2.21)	18,478(4.11)	3.14
	Daegu	455,247(1.71)	13,645(3.03)	3.00
	Inchon	517,473(1.94)	10,890(2.42)	2.10
	Kwangju	315,691(1.19)	8,332(1.85)	2.64
	Daejon	224,843(0.84)	6,328(1.41)	2.81
	Ulsan	342,889(1.29)	6,860(1.52)	2.00
Kyunggi-Province		3,177,794(11.93)	48,557(10.80)	1.53
Kangwon-Province		1,675,927(6.29)	26,245(5.83)	1.57
Chungbuk-Province		1,536,398(5.77)	23,284(5.18)	1.52
Chungnam-Province		2,625,879(9.86)	38,829(8.63)	1.48
Chunbuk-Province		2,504,942(9.41)	39,421(8.76)	1.57
Chunnam-Province		3,885,327(14.59)	56,550(12.57)	1.46
Kyungbuk-Province		3,952,106(14.84)	60,201(13.38)	1.52
Kyungnam-Province		3,380,192(12.69)	52,215(11.61)	1.54
Cheju-Province		481,903(1.81)	8,945(1.99)	1.86

In 1999 the number of the reference land was 449, 959 while the total number of the individual land which are under survey is 26,633,379. Figure 1.1 shows how the reference land are distributed among regions in comparison with the total number, and so the density of the reference land is indicated.

Table 3.2 is an overall criteria which the regional reference lands are selected according to the use of the land in question. The number selected is larger in metropolitan areas, medium

Table 3.2 the criteria of selecting the reference lands with reference to the land use and city size (per 100 units of individual land)(1999)

metropolitan areas	residential	commercial	industrial	green field	other
	3.0	9.0	2.7	2.2	2.2

medium city size	urban areas				quasi-urban areas	agricultural areas	quasi-agricultural areas	reservation
	residential	commercial	industrial	green field				
	2.7	8.0	2.5	2.1	2.1	1.1	1.7	1.1
Gun areas	urban areas				quasi-urban areas	agricultural areas	quasi-agricultural area	reservation
	residential	commercial	industrial	green field				
	2.3	6.2	2.3	2.0	2.0	1.0	1.7	1.0

* in every land use at least 20 individual lands must be included

Table 3.3 the distribution of the reference lands in land use(1999)

no of reference lands	urban areas					non-urban areas
	sub-total	commercial	residential	industrial	green field	
449,959	210,878 (46.9)	33,165 (7.4)	106,433 (23.6)	5,197 (1.2)	66,083 (14.7)	239,081 (53.1)

size city and Gun areas in sequence. In case of land use commercial, residential, industrial etc. in sequence. This means that as the city size is larger and the land use is to commercial the number of the reference lands is more than the other.

Table 3.3 shows the distribution of the reference lands with regard to the actual land use. The proportion of the urban areas is about 46.9%, and that of non-urban area is 53.1%. Within urban area commercial land use(7.4%) is smaller than that of residential(23.6), green-field(14.7%), and larger than industrial(1.2%).

In practice the survey is conducted by two certified public appraisers. And when he conducts an appraisal of the lands individually at the request of other persons, he shall take as the benchmark the officially assessed land price of the reference land which is deemed to have a use value equivalent to the land in question. In doing so he compares one, two or more reference lands which are deemed to have a use value equivalent to the land chosen as the object of appraisal with the latter in terms of various factors such as the location, topography and surroundings etc. which will affect the obhective value of the land, and shall conduct an appraisal in such a manner as to strike a reasonable balance between the price of the land selected as the object of appraisal and the officially assessed land price.

(2) public notice of the price of the reference land

After the survey the MOCT notices several objects, as of the record date of public notice every year, including; lot number of the reference land; price per unit area of the reference land; size and configuration of the reference land; utilization circumtances of the reference land and its adjacent area; and such other particulars as determined by the Presidential Decree.

(3) perusal of Officially Assessed Land Price

Where the MOCT puts up a public notice of land prices, he shall forward it, via the Seoul Special Metropolitan City Mayor, Metropolitan City Mayor or *Do* governor, to the head of *Shi*/*Kun*/*Ku* to enable the general public to pursue it, and shall also draw up books and

diagrams, etc. as prescribed by the Presidential Decree and furnish them to the administrative agencies concerned.

(4) application for objection to Officially Assessed Land Price

After Public notice any person having an objection to the officially assessed land price is entitled to apply for an objection to the MOCT within 30 days from the date of the public notice of the officially assessed land prices. Then the MOCT shall review the propriety of the objection within 30 days from the date of expiration of such an objection application period and notify the applicant of the outcome of the review. In this case, the MOCT shall, where he finds the substance of the objection reasonable, adjust the officially assessed land price in question and put up a public notice again.

(5) determination and public notice of Individually Assessed Official Land Prices

The head of *Shi/Kun/Ku* shall, in order to use the assessed land price for

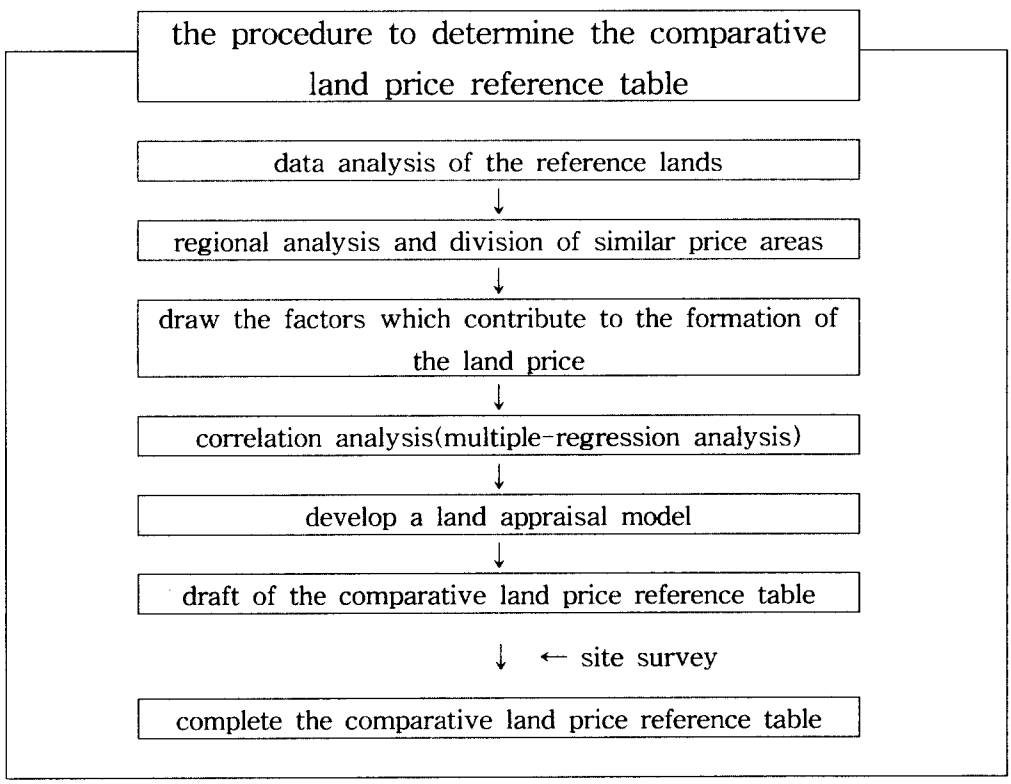

Figure 3.1 the procedure to determine the comparative land price reference table

the purpose of imposing development charges stipulated under the Restitution of Development Gains Act or for such other purposes as stipulated under other Acts and subordinate statues, determine and make public, as of the recorded date of public notice of the officially assessed land price, respective prices of individual lands per unit area situated within his own administrative jurisdictions, subject to the deliberation of the land appraisal commission of *Shi/Kun/Ku* to and shall provide them to relevant administrative agencies.

When the head of *Shi/Kun/Ku* determines and makes public the individually assessed official land price, he shall use 'the comparative land price reference table' and appraise land prices on the basis of the Officially Assessed Land Prices of one, two or more reference lans which are deemed to have a use value equivalent to the land in question, but a balance shall be struck between the the price of the land in question and the Officially Assessed Land Prices of the reference lands.

In this case the head of *Shi/Kun/Ku* refer them to the verification of the property appraisers with respect to their propriety and shall hear options of the owner of the land and other interested parties.

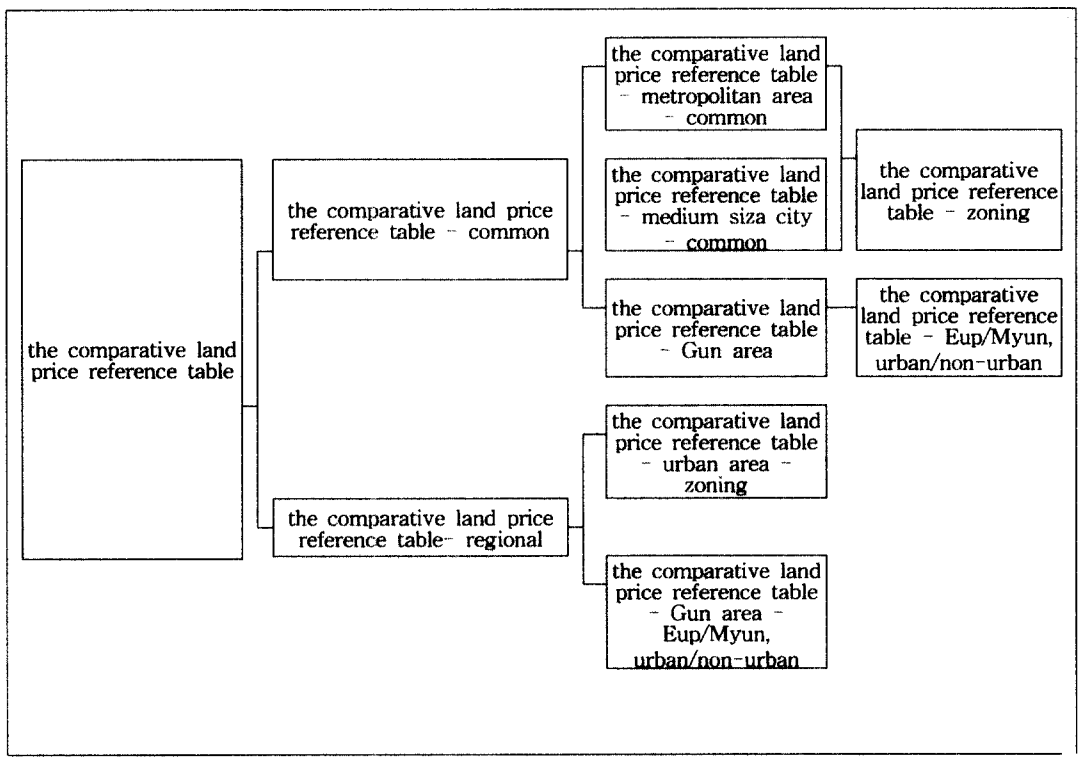

Figure 3.2 the composition of the comparative land price reference table

Where the head of *Shi/Kun/Ku* intends to determine and make public the individually assessed official land prices, they shall obtain confirmation from the MOCT, and where the MOCT intends to confirm the IAOLP, he shall refer the matter to the delibelation of the Central Land Appraisal Commission.

In determining the Individually Assessed Official Land Price the comparative land price reference table plays a decisive role. IAOLP is calculated from the price of the reference land by multiplying the price ratio which is determined by comparing the land characteristics between the land in question and one, or two of the reference lands. The information of the reference lands comes from the certified public appraisers who surveyed and submitted report of appraisal of the reference lands. The whole territory except public lands is divided to similar land price areas, and then in each area the land price and its contributing factors are regressed, and 'the land price model' is determined. The quantitative model to determine the land price model is;

$$P = A[\Pi_{i=1}^{n} X_i^{\alpha i}][\exp(\sum_{j=1}^{m} \beta_j D_j)]$$

where,

P : land price

A : constant

Xi : the distant from CBD

αi : parameter

Dj : dummy variables(zoning, route condition, land use, et cet.)

βj : parameter

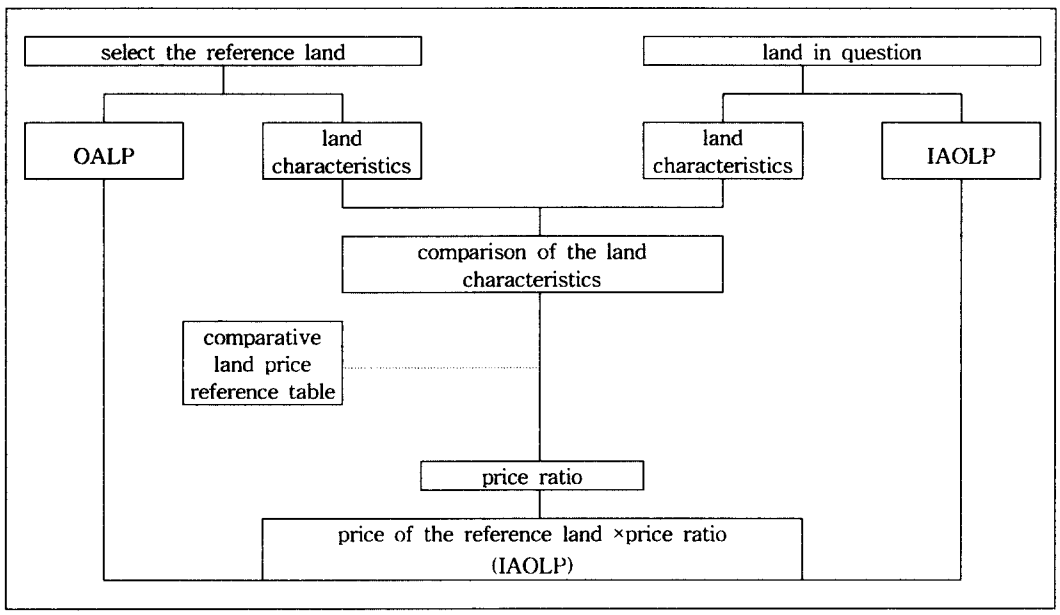

Figure 3.3 the structure of the PNLP system

year	total	number of the application for objection			the results of adjustment		
		subtotal	demand for indrease	demand for decrease	increase	decrease	refuse
'91	24,966,930	17,567 (0.07%)	3,424 <19.5>	14,143 <80.5>	1,237 <7.0>	6,239 <35.5>	10,091 <57.6>
'92	25,127,836	19,980 (0.08%)	4,980 <24.9>	15,000 <76.1>	3,578 <17.9>	6,169 <30.9>	10,233 <51.2>
'93	24,979,648	219,844 (0.88%)	16,894 <7.7>	202,950 <92.3>	11,681 <5.3>	139,556 <63.5>	68,607 <31.2>
'94	25,317,841	45,080 (0.18%)	15,511 <34.4>	29,569 <65.6>	8,239 <18.3>	16,965 <37.6>	19,876 <44.1>
'95	25,529,731	47,873 (0.18%)	16,865 <35.2>	31,008 <64.8>	8,333 <17.4>	18,505 <38.7>	21,035 <43.2>
'96	25,987,320	56,020 (0.20%)	23,597 <42.1>	32,423 <57.9>	12,605 <22.5>	19,509 <34.8>	23,906 <42.7>

Table 4.1 the number of the application for objection to individually assessed official land price and its adjustment by year

(6) application for objection to Individually Assessed Official Land Price

Any person who intends to challenge the individually assessed official land prices may apply for an objection in writing to the head of *Shi/Kun/Ku* within 30 days from the date of determination and public notice of the individually assessed official land prices. Rhe head of *Shi/Kun/Ku* shall review the application for objection within 30 days from the expiration of such period of applying for an application and shall notify the applicant of the result of the review. In this case, the head of *Shi/Kun/Ku* shall, where the substance of the application is deemed reasonable, adjust the individually assessed official and determine and make them public again.

7th step : application

The state, local authorities, government-invested institution as stipulated under the Framework Act on the Management of Government-Invested Institutions, or other public institutions as stipulated under the Presidential Decree coducts as assessment of the price of a land, it shall, by taking as the benchmark the officially assessed land prices of one, two or more reference land deemed to have a use value equivalent to the land in question, conduct the assessment in such a manner as to strike a balance between the price of the land in question and the officially assessed price of the reference land. And provided that where deemed necessary, the assessed land prices may be applied with certain

adjustments depending on such purposes as referred to; compensation for the purchase of lands for public purposes and for the appropriation and use of lands; acquisition and sale of state-owned or publicly-owned lands; purchase of idle lands as stipulated in the Act on the Utilization and management og National Territory; compensation for tje requisition of a land enforced under the Registration Act; and such other assessment of lands as is prescribed by the Presidential Decree or purchase of lands as stipulated

4. Major issues concerning the OALPS

During its 13 years of operation the IAOLP functioned as an indicator to public-purpose administrations, for example in taxation, appropriating capital or planning gains and charging development fees. But the very fact that as such determined prices do not fully reflect the market price or value raised many complaints and sometimes lead to appeals. In particular most appeals are to the Individually Assessed Official Land Price which is directly related to the very magnitude of compensation or tax. To the former people want their valuation price be raised, and the latter reduced, as table 3.1 shows.

But the appeals of the people are not confined to IAOLP, some people reveal pessimism about the fundamentals of the system. Moreover the overall environment surrounding the land market is changing rapidly, and so the need to reform the PNLP system is increasing.

The dissatisfaction of the people would be divided two; the one is related to the necessity of the PNLP system; and the other is about the appropriateness of the techniques and procedure adopted to determine the land prices. As the latter is intricately related to the former, discussions concerning to the latter depends on the former. Even though the conclusion may be a new one, the PNLP system cannot be easily removed in short period unless alternative system can replace the old one. In addition the pessimism about the continuity of the PNLP system is mainly based on the efficiency with regard to the government expenditure, but in considering the efficiency of the system we must pay attention to the spillover effects which cannot be included in calculating and comparing the benefits and costs of the system. This point makes it difficult here to conclude on the former.

So we examine the dissatisfactions of the people to the present system and make comments on its political implications. Accepting the continuing of the system, the discussion is mainly confined to the valuation methods.

As explained earlier the PNLP system is composed of three main parts, but

each has its own weaknesses. Let's examine one by one.

1) Issues surrounding the reference land

In this case main controversy is about the optimum number of the reference lands. As three parts are closely correlated and the accuracy of the reference lands directly affect the IAOLP, how to decide the size of the reference lands and distribute it among regions and land-uses is crucial to the system. Under the present system, the size of the reference lands can variate accordng to; which model is adopted; how to decide the parameters; and which criteria is emphasized.

The size of the reference lands are now about for hundred fifty thousands. But this is determined with top-down approach which determines total reference lands using statistical model, and then allocate it according to both the size of the city or region and the size of the individual lands with regard to its land-use characteristics. As the reference lands do not represent only the prices of the lands, and adopted statistical model is only useful in determining appropriate sample size, as such determined reference lands can be limited in its usefulness.

In practice the local authorities are feeling the size of the reference lands are not much enough, in particular the locations of the reference lands are not good enough to represent a body of similar lands surrounding them. Accordingly it is desirable to be determined with bottom-up approach which the officers of the local authorities determine the size of the reference and its location. In this case total size is just the sum of the regional requirements. Two approaches, however, have relative advantages and disadvantages. For example with bottom-up approaches we can designate more reference lands which are more realistic, but at the expense of more time and cost expenditures.

To increase the usefulness of the system it is more advisable to use the two approaches all together. For example determine the total size of the reference lands from a statistical model and then give the rights to determine actual locations to the local authorities. In this case the reference lands could be more reasonable 'reference' lands.

2) issues concerning the comparative land price reference table

Complains about the comparative land price reference table are of two kinds. The first one is that the IAOLP calculated by using the table do not reflect the real market value or price of the individual land. Of course this may not be from the table, but come from the lack or inappropriateness of the reference lands. In spite of this the reference table is not good enough to transform the OALP to IAOLP.

year	characteristics survey error	error in the selection of the reference land	error in the preparation of the comparative land price reference table	the failure to susutain the land price equilibrium	total
1997	1,094,788	1,111,883	476,748	774	2,684,193
1998	1,470,632	1,165,379	1,461	685,014	3,322,486

Table 4.2 the reasons for the miss calculations in the IAOLP

The next one is that without comprehensive review of the table, the composition and applying methods is changing. While the publicly noticed price is based on the value or price of a land assuming its highest and best use, the table is based on the land-use characteristics. This made the difference between the IAOLP and actual transaction price enlarged; for example the former is used as criteria of the government and the latter the criteria of the people when compulsory purchase is proceeding.

This problem could be improved by increasing the appropriateness of the reference lands and enlarging the size of the reference lands. But basic problem remains that while the table is based on the valuation approach, its actual use is based on the comparison approach. Similar to the first ond more fundamental solutions are relate to the overall system.

3) issues concerning the IAOLP

The problem of the IAOLP is not of its own. It is closely related to the price of related reference lands and application of the comparative reference table. So as with first and second issues this must be solved through overall review of the system.

5. Conclusion: The future of the OALP system

In any market the price of a good reflect current conditions of demand and supply. But the market does more than indicate, because buyers and sellers respond to these price signals, it also motivates. The idea of land as a whole being fixed in supply has been important in past discussions of cost and value. The fixity of land is, however, weakening as new land-use is appearing continuously and the time interval which makes a new one more economically viable is shortening. So it is becoming more important to appraise the exact value of the land in question when compulsory purchase is imperative. In these case the IAOLP function as an indicator.

Accordingly, in spite of the all its problems, it is undesirable to remove the PNLP system without any realistic alternative. So it is necessary to review the system in the short run and in the

long run differently. In short run it is imperative to sustain present system, and adjust case by case to solve the problems of each step. In the long run, however, the system must be reviewed with the fundamentals of the system, because partial adjustments cannot get rid of all the problems.

But the OALP system does not exist all alone, and to achieve and strengthen the policy objectives of the system, many institutional arrangements must be considered all together, and may be out of this overview.

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