Influence of Fixtures and Business Types upon Industrial Properties' Rent

Saejoon Oh

Changshin University
saoh2@cs.ac.kr

Abstract

This study analyzes factors affecting industrial buildings rent located in Siwha National industrial complexes in Korea. The results verify that certain characteristics significantly affect the rent prices of industrial properties: location, physical buildings, inside facilities, categories of industry (business type), and macro environment. To differentiate this paper from earlier studies, it includes the characteristics of factory fixtures and business types. In addition, this study is distinctive, in that it uses the real transaction prices of factories, enhancing its reliability.

1. Introduction

The factories are typically designed for sole use of their business type; electric capacity or ample spaces are optimized for their specific use. Therefore, if factories have space flexibility for different types of business use, the potential demand for those factories will naturally increase, and consequently, the rent increase will follow. As for industrial complexes, the factory land prices for installment sales are mostly affected by local land prices depending on the time when they are in the planning or build-up stage. However, after their completion, the prices of factories in industrial complexes are affected by specific factors of industrial complexes, such as their actual output, activation, or accessibility to neighboring cities. Therefore, the prices of industrial properties are affected by various factors. It is difficult to find the studies regarding the subject, since industrial properties have different and distinctive characteristics as compared to those of residential or commercial properties. [1]

This study tries to analyze factors affecting rent price of light industry factories. The related earlier studies are mostly for physical characteristics, such as location or building itself. To differentiate this paper from earlier studies, it includes characteristics of factory facilities and business types. In addition, this study is distinctive, in that it uses the real transaction price of factories, enhancing its reliability. This study could be used as guidelines for the government or practitioners to make plans regarding new industrial complexes. It can also help practical factory users understand factors affecting rent price of manufacturing industry and make their decision faster and efficient.

2. Literature Review

Among earlier literatures on price decision factors of industrial properties, Ambrose (1990) studied factors affecting the asking prices of light industrial factories in Atlanta, US. The author compared the asking price for sales and rent, and reported that office areas, the number of Dock-high Door and Drive-in Door, and the existence of sprinkler affected the asking price of rent [1].

Kowalski and Paraskevopoulos (1990) analyzed the relationship between location and industrial land prices of CBD. They examined its price decision factors by using the data of 56 industrial lands in the outskirts of Detroit, US. The result showed that visibility of expressways, location inside industrial complexes, lot area, and the width of facing road were positively(+) related, on the other hand, the size of building site was negatively (-) related to their prices[2].

Faribach et al. (1993) examined the data of 170 industrial buildings in Dallas, US, for price decision factors analysis. They presented significant factors were the size of buildings and offices, the number of dock-high door, the ceiling height, the building age, the distance to airports, business types, point of sale, and interest rates [3]. In addition, as for the case of Single Tenant of a industrial property, mostly a owner occupied and operated, they argued that the single tenant occupied industrial property prices formed relatively higher than the rest, since the owners took more care of their buildings. Unlike Ambrose (1990)[1], they included location factors and macro economic factors for the study. The size of buildings was calculated by using the rentable area. Since the industrial properties require manufacturing facilities, products are often piled high. Therefore, Cubic Feet is often used as unit area for the factory pricing. Though not all the cases reflect the factory height, there is no precise method for calculation.

Dunse and Jones (2005) examined the effect of location and deterioration of industrial buildings on depreciation of rent in Glasgow, Scotland. Their results showed that the rent decreased as the buildings and facilities deteriorated and they located far from expressway junctions and neighboring cities with the population of 20,000[4].

3. Empirical Analysis

In this model, the dependent variable represents the converted rent of a factory per specific rent area. Hedonic Price Model is built by using the multiple regression analysis [5].

Location factors, for example, distance to expressway IC are collected from the 'NAVER' map service [6]. As for macro environmental characteristics, statistics data on industrial complexes is collected from Korea Industrial Complex Corporation [7], Korea Statistical Information System [8], and The Bank of Korea Economic Statistics System [9].

3.1 Definitions of variables

The dependent variable, converted rent price is calculated by following the formula; convert the deposit to monthly rent, add it to monthly rent, and then divide by rent area of a factory. The independent variable, accessibility to expressway, is measured as the direct distance from a factory to expressway Interchange. The width of the factory facing road is wider than 12m, and the crossroad location is represented as a dummy variable.

In respect of physical building characteristics, the total floor area and lot area are selected as variables to figure out the price difference depending on the factory sizes. For the building age, the year of completion is subtracted from the time of investigation. The

ceiling height is collected from the descriptions in the contracts, and the omitted parts are gathered from registered building ledger by measuring the main building heights.

The total capacity of hoist is represented by the unit, Ton, and that of power supply, kW. Due to multicollinearity, the number of parking spaces available is calculated by the number of available parking per lot area. Factories equipped with waste water disposal is represented as dummy.

The variable of interest rate on loans in macro environmental characteristics is shown as new monthly interest rate on loans for small & medium industry, and GRDP is from the data of Gyeong-gi province per year of transaction. The average operation rate on manufacturing industry is nationwide figures and gathered from the monthly measured data. The employment to population ratio is from the monthly data by the regions.

3.2 Descriptive Statistics

The basic statistics of the data to examine factors affecting rent price of factories is as follows; the rentable area is from 66m² at a minimum to the maximum of 5,643m², and 619.4 m² on average. The rent price varies from a minimum of USD333 to the maximum of USD31,667 and USD3,801 on average.

As for the basic statistics of buildings, the total floor area of factories in data samples is 3,630m² on average, varying from at a minimum of 326.7m² to the maximum of 38,418.6m². The lot area is approximately 997.9m² to 49,282m², averagely 4,290m².

The average building age is 16 years, and the ceiling height is 6.7m. Among the equipment facilities, the hoist capacity varies from 1ton to 67.5ton, and the power supply capacity are from 10kw to 1,000kw. The monthly interest rate on loans is from 4.21% to 6.04%, and the average monthly employment to population ratio is 61%, and average monthly operation rate on manufacturing industry is 77%.

3.3 Empirical Result

The location characteristics are not significant due to the limitation of data collection; the data is restricted to specific industrial complexes. It seems that since the factories are gathered in the same complexes, the variable of accessibility to expressway IC doesn't show much significance; the factories share the same expressway, so their accessibility is quite similar.

In respect of physical building characteristics, the variable of total floor area and lot area do not show significance, however, the rentable area is negatively related. As discussed above, it is because the potential consumers decreases, when the size of factories gets bigger. It could be interpreted as that the total floor area is insignificant, since the factories keep their own operation methods and business categories.

The equipment facilities in the factories, such as the ceiling height, hoist, and power supply, are all positively related. This shows the equipment facilities in the factories affect rent of industrial properties. However, the variable of waste water disposal doesn't show much significance. This may be interpreted as the demand for waste water disposal is relatively low as compared to that of entire factories.

The category of business does not show significance. The highest coefficient is from the category of electronics, followed by mechanical parts, and metal & steel and chemistry. It seems that the electronics business is a higher value-added business as compared to other small & medium industries. The chemistry and metal & steel industry belong to the minor categories, representing less than 10% of the total business sectors in the industrial complexes, as compared to that of electronics and mechanical parts,

representing 65% of the total business sectors. This might be the reason for their relatively low coefficient value.

Table 1. Result of OLS regression

Model		Nonstandard coefficient		S. coefficient	t	Multi collinearity Stat.	
		B	S.E	β		T.E.	VIF
Location	(constant)	80693.149	23632.416		3.415		
	Acc. to express IC	-176.248	394.657	-.016	-.447	.833	1.200
	Corner facing med. width road	939.695*	677.385	.047	1.387	.924	1.083
Building	Total floor area	-.175	.216	-.059	-.809	.202	4.950
	Lot area	-.011	.149	-.005	-.075	.214	4.669
	Rentable area	-12.685***	2.196	-.244	-5.775	.602	1.661
	Parking	80370.982	94691.024	.038	.849	.536	1.867
	Ages	-198.592***	69.015	-.107	-2.878	.775	1.291
Facility	Ceiling height	1006.780***	181.848	.213	5.536	.721	1.387
	Hoist	191.650***	68.914	.116	2.781	.618	1.617
	Electricity	16.138***	2.997	.194	5.384	.823	1.216
	Waste water disposal	3066.292	2662.024	.041	1.152	.865	1.156
Business type	Mechanical parts	-187.901	693.628	-.010	-.271	.721	1.388
	Electronics	1027.412	1120.576	.034	.917	.779	1.284
	Chemical industry	-2421.074	1822.443	-.047	-1.328	.866	1.154
	Metal & steel	-2265.587**	982.250	-.086	-2.307	.772	1.295
Macro environment	Int. rate on loans	3329.588**	1550.611	.184	2.147	.145	6.886
	GRDP	.154***	.017	.701	9.235	.186	5.386
	Emp. to pop. ratio	123.727	316.311	.015	.391	.701	1.427
	Avg. opr. rate	260.115*	156.702	.068	1.660	.630	1.588
Dependent variable = Converted Rent/Rentable Area							
N=642 F value=27.554 R^2=0.561 Adjusted R^2=0.540							

As for macro environmental characteristics, the variable of interest rate on loans is positively related to the rent price of industrial properties. When the interest rate on loans increases, the potential buyers are affected by the burden of repayment, and choose to rent rather than purchase, as a result, the rent goes up and sale price down. In addition, as GRDP and the average operation rate on manufacturing industry increase, so do the rent prices of factories. However, the variable of employment to population ratio is not significant to the rent price of industrial properties.

4. Conclusion

This study analyzes factors affecting industrial buildings rent by using real transaction data of 642 factories located in Siwha national industrial complexes. The results verify

that certain characteristics significantly affect the rent prices of industrial properties: location, physical buildings, inside facilities, category of industry (business type), and macro environment. This can be summarized as below.

Firstly, the result shows that the width of facing road of factories is significantly related to factory rent prices; the wider the road, the higher the rent. However, the accessibility to expressways shows insignificance. It might be due to the limitation of sample data collected from specific district in Siwha national industrial complexes. This needs further verification by using related nationwide data.

Secondly, it is confirmed that high ceiling height, sufficient power supply, and large capacity hoist positively affect factory rent. The ceiling height is a significant factor for factory rent since it allows various factory facilities and efficient production activities. Therefore, the factories with higher ceilings ask for higher rent. In addition, hoist is a major facility in factories, so that factories equipped with large capacity hoist, sufficient power supply, and waste water disposal are favored in the market.

Thirdly, the business type of factories is not significantly related to rent price of industrial properties. The category of electronics shows the highest coefficient, followed by mechanical parts, metal & steel, and chemical industry. It seems that the major business types in Siwha national industrial complexes are mechanical parts and electronics, representing 70% of its total business.

Fourthly and lastly, it is confirmed that macro environmental characteristics affect purchase and sale price of factories. The interest rate on loans at the time of transaction positively affects purchase and sale price of industrial properties. When the interest rate goes up, potential buyers would rather rent due to the burden of repayment; the rent naturally goes up. Moreover, high GRDP may be interpreted as the sign for an economy boom. Therefore, macro environmental invigoration may positively affect factory rent.

This study is meaningful in that it analyzes factors affecting industrial properties rent by using real transaction sales data in spite of difficult data acquisition. It may trigger public attention to industrial properties in the real estate market. Given that further related studies on industrial properties are continued, more objective and precise data building is going to be available. When objective baseline data is collected and established, this can be used for government, companies, developers, and marketers when planning or developing lands for industrial use, building or expanding factories, making related policies, and etc.

References

[1] B.W. Ambrose, An Analysis of the Factors Affecting Light Industrial Property Valuation, Journal of Real Estate Research. 3, 5 **(1990)**.

[2] J. Kowalski and C. Paraskevopoulos, The Impact of Location on Urban Industrial Land Prices, Journal of Urban Economics. 1, 27 **(1990)**

[3] F. A. Fehribach, R. Rutherford and M. E. Eakin, An Analysis of the Determinants of Industrial Property Valuation, Journal of Real Estate Research. 3, 8 **(1993)**

[4] N. Dunes and C. Jones, Rental Depreciation Obsolescence and Location: the Case of Industrial Properties, Journal of Property Research. 3, 22 **(2005)**

[5] S. Rosen, Hedonic Prices and Implicit Markets: Product Differentiation in Pure Competition, Journal of Political Economy. 82 **(1974)**.

[6] NAVER Map Service. Available online: http://map.naver.com

[7] Korea Industrial Complex Corporation. Available online: http://www.kicox.or.kr

[8] Korean Statistical Information Service. Available online: http://kosis.kr

[9] The Bank of Korea, Economic Statistics System. Available online: http://ecos.bok.or.kr/