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THE EFFECTS OF LOCATION VARIABLES ON THE FRANCHISED COFFEE SHOP RENTS

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ABSTRACT

This study investigated the relationship between the characteristics of franchised coffee shops and the retail rents. Also, it investigated how their location affected the retail rent in Seoul. It used the Central place, retail agglomeration, bid rents and demand-externality theories as the basis for the empirical models. The data used in this study consisted of 200 retail units in Seoul. The results show that coffee shop's sales per 3.3 m^2, characteristic of the coffee shop's primary trade-areas, and characteristic of coffee shop affected the coffee shop's rents per 3.3 m^2, Coffee shop's sales were the major determinant of coffee shop's rents. Also, coffee shop's goodwill per 3.3 m^2 and land price per m^2 were positively correlated with a coffee shop's rents. Additionally, number of wholesale companies and manufacturers in the coffee shop's retail trade-areas influenced coffee shop's rent. In summary, the study shows that coffee shop's brand identity, location and retail mix externalities affected a coffee shop's rent.

Keywords: Franchised coffee shop, Retail rents, Location, Brand identity, Retail Sales, Multi-Regression Analysis

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INTRODUCTION

The value of retail buildings is associated directly with the setting of retail rents. Analysing the determinants of retail property rents in these contracts is crucial. Both landowners and tenants need to consider various factors such as rent adjustment, stale income and the effect of other retail buildings' sales on the value of their building. The tenants usually sign a contract for a certain period without having any accurate information on the sales income and the rents of similar buildings and have to pay the rents on a regular basis once the contract is signed. Therefore, both parties should scrutinize the determining factors of rents or control risks prior to signing the contract. The past years have seen rising property prices, and this has prompted an increase in investment and development in retail buildings. Developers need to review the factors affecting the creation of value in the successful development of retail property to guarantee their profits and build working strategies for adequate spatial allocation and choosing the combinations of tenants.
The purpose of this study is to identify the determinants of shop rents by using empirical data gathered from the retail building market in Seoul and, by doing so, provide a possible explanation for the causal relationship between the determinants and retail rents.

LITERATURE REVIEW

Theories on commercial buildings began to be formulated from urban spatial structure, location and spatial structure (Hotelling, 1929; Christaller, 1933; Losh 1940; Alonso, 1964; Vandell and Lane, 1987; Pearson, 1991; Brueckner, 1993; Roulac, 1996; Brown, 1999). It needs to be noted that empirical studies on the determinants of retail property rents have rarely been conducted.
The fact that data on retail property rents is hard to get and that getting the data requires specialized expertise, as compared to data on residential real estate, is the probable cause of the scarcity of studies in this field. Analysts should consider consumer behavior, the nature of the buildings and the specific items to be sold in the tenants' shops when they analyse the market. Rent setting is affected by numerous factors: accessibility, visibility, and household spending power, the sales income of the shops, the existence of competitive and supplementary facilities, traffic conditions near the buildings, the habits of the passers-by, the local economy, administrative fees, and relevant regulations.
Existing studies on rents used the multiple regression models using a cross-section of data, or time serial analysis using the vertical section data of a medium rent in a particular area. Tay, Lau and Leung (1991) showed the level of shopping center rents has a positive relationship with the age of the shopping center, as does the rent per unit with the size of the shopping center. However rents have a negative relationship with the size of shops. The vast majority of the studies used shopping center lease contracts for their rent modeling. This study, however, uses Korean retail property rent case-studies to attempt to build an alternative model.

Theoretical Framework

Shop rents located in business district are determined by the size of a franchised coffee shop, the width of the front road, physical characteristics, and location. This study hypothesizes rents based on the variables below.

$$RENT_{jt}=f(FAC_j, LOCE_{j,}, PER_j) \quad (1)$$

Where, $RENT_{jt}$ is the shop rent per $3.3\,m^2$ (approximately equal to 1 pyung [坪], Korean traditional area measure) for the j^{th} building in the t^{th} year; FAC_j is a vector of size of the facility; $LOCE_j$ reflects local economic conditions; PER_j represents the performance of the franchised coffee shop.

Size of Coffee Shop

The power of coffee shop to attract customers into the building, and sales income, are two major determinants of rents. The Size of the coffee shop is assumed to be positively related to their appeal to

customers. Proxy variables of the value of retail properties are: total floor area, number of ground floors and underground floors, parking lot capacity, and the total number of elevators. The size of the coffee shop is also assumed to have a positive relationship to the rental value. The larger the size of the retail property, the more diverse the tenants would be. The size of a coffee shop is a variable affecting the appeal to customers. Large-sized retail properties are thought to have high customer appeal due to population density and highly complementary neighboring shops. Therefore landowners of large-sized buildings tend to charge high shop rents to their clients, while those of small-sized shopping malls with grocery stores are expected to charge less because they can attract only local consumers.

Neighborhood Life Cycle Stages

Generally speaking, Neighborhood life cycle stage tends to have a negative effect on rents. Compared with outdated facilities, modern buildings tend to charge high rents to tenants. As the physical appearance of coffee shops, however, changes gradually over a long time period, a brand-new building is expected to have a higher shop rent due to factors such as the nature of the (broad) commercial district, rising neighborhood property prices, and alteration of land-use purpose.

Location

Location is known to play a key role in determining coffee shop rents. Site selection and rents have been used as basic data for market analysis in the development of retail property. Variables involved in considering location are business district, neighborhood, and location of building. Proxy variables involved in the consideration of location could include convenience of traffic, accessibility, visibility, population density, growth potential and income of residents.

Economic clout of the business district

The population and income level of the neighborhood are two major factors affecting the growth potential of the business district, and, therefore, the area with high population density, strong growth potential and high income tends to have high rents. It usually takes over two years for a business district to develop. Coffee shop rents near a subway station linked to the major commercial district usually tend to be higher than those without a station in the outskirts. Coffee shop rents are closely related to the economic clout of the surrounding business district. Proxy variables indicating economic clout are the levels of security rental bonds, and outgoings charges per retail unit.

Accessibility

Analysts tend to consider consumers more closely than suppliers. Coffee shops are expected to be easily found and accessible. The location of the business district is assumed to have minimal impediments that could give rise to time delays, and other economic and mental inhibitions to consumers. Coffee shops located along trunk or wide roads are considered to be ideal, and the tenants tend to pay high rents for their malls on this location. Rents are determined by various factors such as the height of the lot, location within the building, and distance from the lifts. Proxy variables affected by the distance from the subway station to the shop are transportation fees and time consumed whilst in traffic.

Location inside a building

Rents are also determined by the vertical and horizontal location inside a building. Usually the malls located on the first floor have higher rents than those on the second or underground floors. The distance from lifts or other malls also affects the setting of rent prices. Even malls on the same floor may have differentiated rents, depending on their vicinity to a lift.

Urban Economic

The source of demand for real estate is a part of the business activity in the area. Changes in hiring practice of economically active population for each industry greatly affect the market and they are usually followed by changes in the consumption pattern. That is, people working in the secondary or tertiary industry maintain the westernized life style, so they contribute greatly in increasing the demand for consumer goods including durables. In this case, department stores with the concentration of sales businesses or discount stores with restaurants will suitably cater for the population as well as the food court, entertainment district, hotel, cram school, or theater.

Tenants

The issue of tenants can be discussed with the performance of the franchised coffee shop and tenants mix as below:

The performance of the franchised coffee shop

According to studies on retail rents or retail property, income positively affect retail sales (Ferber; 1958 & Liu; 1970); and total population, household size and population change can explain total retail sales (Liu; 1970, Ingene and Yu; 1981, Adamchak, Bloomquist, Bausman and Qureshi; 1999). A change in the income-generating capacity of the shopping center , in general, do not respond immediately average retail rents in a regional shopping center (Chun, Eppli and Shilling; 2001). There is the time-lag effects relationship between retail sales and retail rents.

Tenants mix

Core tenants affect coffee shop rents. Core tenants represent global, national or regional brands. Nationally-branded tenants have numerous franchised commercial networks, and they are expected to create high sales income. Banks are a proxy variable for core tenants.

DATA

Sample

The data set used for this study consists of 2,000 examples of retail unit lease in Seoul and the transcripts of the lists of each registered real estate agency in 2014. Monthly rent per 3.3㎡ was assigned as a response variable, and items of facility and location were assigned as explanatory variables. The monthly rent, rental bond, and goodwill per 3.3㎡ in Seoul came from data on the coffee shops, which were on the market from December 1st of 2014 to December 31st of the year. The explanatory variables chosen were: rental bond of shop, goodwill of shop, retail sales of shop, the weight of monthly rents to the total rents ratio, The deposit to total rents ratio of shop, shop size, population density, population Aging, average rental bond per 3.3㎡, average of monthly rents per 3.3㎡, average goodwill per 3.3㎡, number of retail & wholesale companies, number of transforming companies, number of manufacturing companies, numbers of public employee. The data which used in this study summarized in the following table:

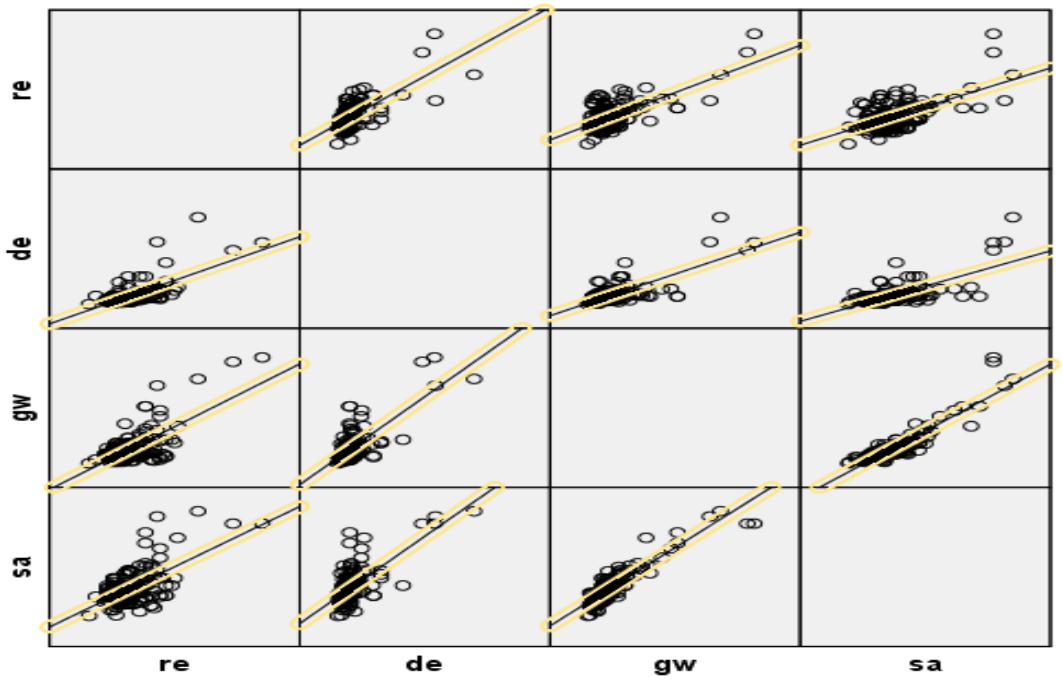
Table 1: Descriptive Statistics

Variable	Mean	S D	Minimum	Maximum
Monthly rent of shop	**15.59**	**7.54**	**3**	**60**
Rental bond of shop	**33.53**	**40.35**	**3**	**313**
Goodwill of shop	**98.25**	**102.50**	**9**	**667**
Retail sales of shop	**4.80**	**2.36**	**1**	**15**
Monthly rent to total rents ratio	**90.02**	**1.41**	**91**	**100**
Deposit to total rents ratio of shop	**1.98**	**1.41**	**0**	**9**
Shop size	**13.27**	**6.07**	**3**	**50**
Population density	**4.80**	**2.36**	**7,502**	**29,028**
Population Aging (%)	**78.8**	**20.37**	**49**	**114**
Average of rental bond	**279**	**111.10**	**58**	**279**
Average of monthly rents	**9**	**5.99**	**4**	**9**
Average goodwill	**206**	**143.03**	**68**	**206**
Number of wholesale and retail co	**11,593.76**	**8,214.40**	**4,396**	**37,945**
Number of transportation companies	**2,923.51**	**676.29**	**1,477**	**6,379**
Number of manufacturing companies	**3,167.18**	**2,524.30**	**1,120**	**12,215**
Numbers of public employee	**5,506.67**	**3,349.54**	**2,842**	**16,992**

Analysis of Relationship between Variables

In order to establish the research model for this study, a bi-variate scatter plot was analyzed to investigate whether the monthly rent of coffee shop had the standard distribution and to study the correlation coefficient between elements that determined the rent. The result was a plot which showed the elements determine monthly rent of coffee shop in Seoul.

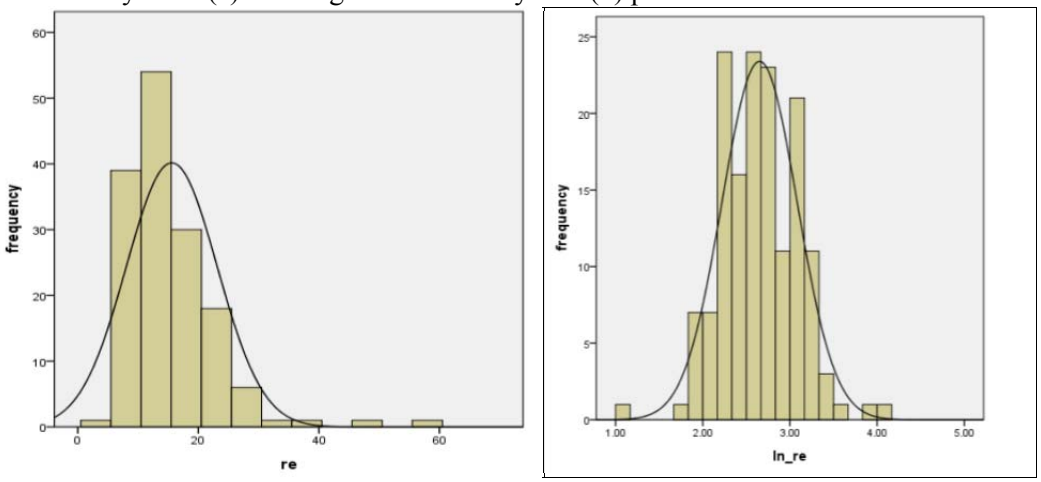
Figure 1: Scatter Plot Matrix of Response Variables and Major Explanatory Variables



Note: RE: monthly rent per *3.3* m^2 ; DE: security rental bond per *3.3* m^2; GW: goodwill for the shop per *3.3* m^2; SA: shop sales per *3.3* m^2

Commercial leasing contracts in Korea mainly consist of monthly rent plus rental bond and goodwill. In general, the value of monthly rent is inversely proportional to the rental bond with respect to the whole lease amount, but the Figure shows the relationship between the monthly rent per *3.3* m^2 and rental bond per *3.3* m^2 or goodwill per *3.3* m^2 to be linear. If the two elements were to share an equal amount per *3.3* m^2 in monthly rent, they would spread out around the y=x line. However, the data points of monthly rent and rental bond are located in the area where y>x, so one can see that the monthly rent carries greater weight than the rental bond. Moreover, the data points of monthly rent and goodwill are located in the area where y<x, so one can see that goodwill carries greater weight than the monthly rent. Similarly the data points of rental bond per *3.3* m^2 and goodwill per *3.3* m^2 are located in the area where y<x, so one can see that rental bond carries greater weight than outgoing charges. According to the scatter plot, there exists a linear relationship between the monthly rent per *3.3* m^2 and goodwill per *3.3* m^2, the monthly rent per *3.3* m^2 and rental bond per *3.3* m^2, or goodwill per *3.3* m^2 and rental bond per *3.3* m^2, but outliers are also found as well. Especially there is a clear linear relationship between the monthly rent per *3.3* m^2 and rental bond per *3.3* m^2. As the Figure 2 shows, the distribution of monthly rents takes the form of a long tail in the right-hand direction, and the parametric statistics based on normal distribution and tests were investigated. As a result, the distribution problem having a long tail in the right direction which is shown in the Figure 2(b), R^2 ($adjR^2$) of regression models per stage based on Original Data set are 0.689 (p <0.00). Hence, a natural logarithm was applied to the logistic regression variable. A wide range of rents is found in coffee shops in core commercial districts, and a wide gap between retail rents when compared to advantageous commercial districts such as in the volume of foot traffic on pedestrian shopping streets were also found.

Figure 2: Monthly Rent (a) and Logarithm Monthly rent (b) per 3.3㎡



(a) (b)

EMPIRICAL RESULTS

This study centered on the franchised coffee shops among commercial real estate developments in Seoul, and multiple-regression analysis was utilized. The research model went through, 1) verification of multi-collinearity, and 2) selection of variables to extract variables related to shop rent.

Multi-Collinearity

This study also analysed the multi-collinearity of the data. When the multi-collinearity was reviewed based on the inflation factor variable, a very large multiple-collinearity between number of retail & wholesale companies and number of manufacturing companies was found. In order to investigate this multi-collinearity, this study used a principal component analysis and correlation analysis. The multi-collinearity was a result of the regression based on number of retail & wholesale companies and number of manufacturing companies. Correlation data predicts that the correlation coefficient (-0.9617) of number of retail & wholesale companies and number of manufacturing companies means that the two variables have a close value.[3] Also, the correlation between the number of ground floors and construction completion date shows a strongly positive relationship. The result indicates that as time goes, intensive land-use occurs.

The principal components analysis was used to reduce the multi-collinearity among variables. Eigen values of four factors are 5.27, 3.71, 2.11, 1.17, and the aggregated value of the four factors explained the total 81.9 % (Factor 1 representing the response to monthly rent shows 35.1%, Factor 2: 24.7%, Factor 3: 14.1%, Factor 4: 7.8% and Factor 5: 6.4 %). Factor 14 merely explains below 0% of the entire alteration, and, therefore, it could be negligible. Regarding proportion, the Factor 1 has the highest score while the Factor 14 has the lowest. The column of cumulative ratio explains 81.9 % of the total Factor (P=14), and the three principal components could be interpreted to summarize the given data appropriately. Therefore, data on 14-dimension can be miniaturized through principal components in 4-dimension.

[3] The study of C.F.Sirmans and Krisandra A.Guidry) (1992) found a high multicolinearity between the aggregated space and the size of parking lot (+0.96).

Table 2: Eigenvalues of the Correlation Matrix

	Eigenvalue	Difference	Proportion	Cumulative
1	5.278	35.187	35.187	5.278
2	3.716	24.772	59.960	3.716
3	2.117	14.115	74.075	2.117
4	**1.176**	**7.842**	**81.916**	**1.176**
5	.970	6.465	88.381	.970
6	.665	4.435	92.816	.665
7	.345	2.299	95.115	.345
8	.290	1.933	97.048	.290
8	.197	1.310	98.358	.197
9	.117	.782	99.140	.117
10	.068	.451	99.591	.068
11	.037	.249	99.840	.037
12	.016	.104	99.944	.016
13	.008	.056	100.000	.008
14	.000	.000	100.000	.000

- Number 1 principal component = 0.82×(Average rental bond in the retail trade-area) + 0.82×(Number of retail & wholesale companies) + 0.80×(Average monthly rents for retail trade-area) + 0.79×(Number of public employee) + 0.72×(the average goodwill for retail trade-area) + 0.71×(Number of manufacturing companies).

- Number 2 principal component = -0.74×(rental bond) + 0.72×(the weight of monthly rents to the total rents ratio) - 0.72×(the weight of rental bond to the total rents ratio of shop) - 0.65×(goodwill) + 0.52×(Shop size).

- Number 3 principal component = -0.86×(Population aging) + 0.67×(Number of transportation companies) + 0.43× (Population density).

- Number 4 principal component = 0.47×(Number of manufacturing companies) + 0.62×(Population density).

Regarding the principal component, Factor 1; average rental bond in the retail trade-area , number of retail & wholesale companies , average monthly rents, number of public employee , the average goodwill for retail trade-areas and number of manufacturing companies have common characteristics, while principal component, Factor 2; rental bond, the weight of monthly rents to the total rents ratio, the weight of rental bond to the total rents ratio, goodwill for the shop, retail sales and shop size, also have manifestly common

characteristics. The meaning of each principal component can interpreted based on the common characteristics of the result. Principal component, the Factor 1 can be called 'local economic conditions'. Principal component, the Factor 2 can be called 'the characteristics of the facility'. Principal component, the Factor 3 can be called 'the young town' and principal component, the Factor 4 can be called 'industrial area'.

Eigenvector from the Table 3 shows that principal component 1 has almost same value across the fifteen variables, and it indicates the cumulative average value of all the variables. Meanwhile, the principal component 2 shows a contrast between shop size and number of manufacturing companies, average rental bond, average goodwill, average monthly rents against rental bond ratio, goodwill of the shop, retail sales.

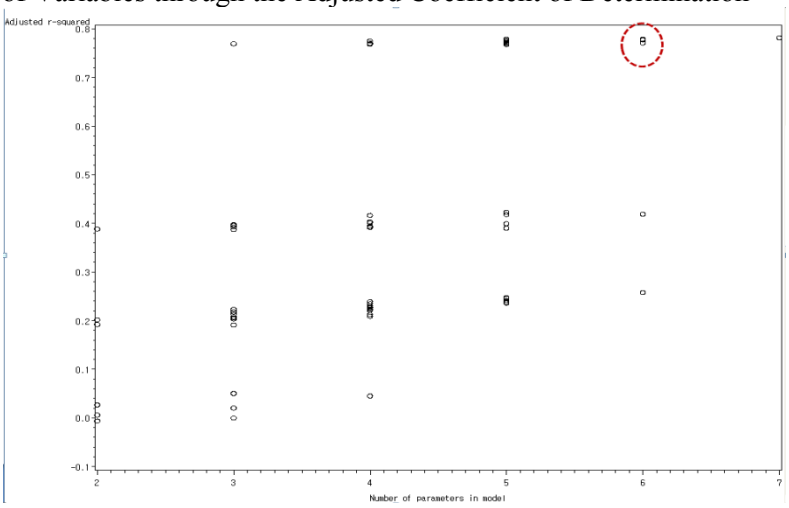
Table 3: Eigenvectors

Variable	Prin 1	Prin 2	Prin 3	Prin 4
Average rental bond in the retail trade-area	**.829**	.435	.034	.136
Number of retail & wholesale companies	**.828**	.429	-.007	.262
Average monthly rents for retail trade-area	**.802**	.459	**.315**	-.135
Number of public employee	**.793**	.141	-.107	**-.314**
Average goodwill for retail trade-area	**.724**	.462	**.454**	-.122
Number of manufacturing companies	**.713**	.333	-.207	**.470**
Rental bond for the shop	.474	**-.745**	.202	.032
The weight of monthly rents to the total rents ratio of shop	-.317	**.729**	-.379	.172
The weight of rental bond to the total rents ratio of shop	.317	**-.729**	.379	-.172
Goodwill of shop	.534	**-.650**	-.024	.220
Sale price of shop	.541	**-.614**	.042	.183
Shop size	-.278	**.523**	.161	**-.333**
Population aging	.139	-.288	**-.867**	.139
Number of transportation companies	-.487	.089	**.679**	.272
Population density	-.514	.086	**.432**	**.624**

Extraction of Variables

Before deciding upon significant variables, the proper number of variables which make up the scaled-down model was selected through the plot which represents Mallows' C_p and adjusted coefficient of determination ($adjR^2$). According to Mallows' C_p, a scaled-down model with 6 variables was preferred, whereas according to the adjusted coefficient of determination ($adjR^2$) standard, a range of 6 variables was preferred. The number of preferred variables in both models is the same.

Figure 3: Selection of Variables through the Adjusted Coefficient of Determination



This is a process deciding *p* number of explanatory variables among 9 variables which are expected to affect the monthly rent of a franchised coffee shop. Through several methods of selecting variables, parameters were measured among the 9 correlation variables which are directly related to a franchised coffee shop rents. Among them only the variables representing the weight of monthly rents to total rents ratio, retail sales of shop, rental bond of shop, and goodwill of shop had reliability quotients higher than 95%. According to the adjusted coefficient of determination (adjR^2) standard, a scaled-down model with step(s) more than 1 but less than 6 is preferred. However, there is not much difference among the 6 models.

Table 4: Stepwise Regression Method

Step	Variables	Partial R-Square	R-Square	C_P	*F-value*	Pr>F
1	X6_rental bond of shop	0.3926	0.3926	272.347	96.95	0.000
2	X7_ the weight of monthly rents to the total rents ratio	0.3800	0.7726	11.3690	248.99	0.000
3	X8_ retail sales of shop	0.0071	0.7797	8.4702	4.76	0.030
4	X5_ goodwill of shop	0.0050	0.7847	7.0200	3.40	0.067

The results of analysing the final regression model using the stepwise regression method are summarized in the Table 4. For the major variables, steps 1 and 2 selected *rental bond and the weight of monthly rents to the total rents ratio*, as in the forward selection method; step 3 selected *retail sales*, and step 4 selected the *goodwill*.

Based on past studies and stepwise selection of variables, this study was able to build the optimal regression model shown in the Table 4. The stepwise selection of variables was right for this occasion because the *F-value* was higher than values obtained from other variable selection methods. However, it should be noted that none of the methods can assure the optimal regression equation, and that there could be more than two equations. When the statistic of 6 explanatory variables is investigated, *P-values* of all the variables except the number of elevators are below 0.05, thereby making them significant above 95%. In addition, the adjusted coefficient of determination (adjR^2) which denotes the explanatory power of the optimal regression model was 0.7818, which was rather high when compared to the results from previous studies.

Table 5: Comparison of C_p, adjR^2, and MSE

P	*Variable*	C_p	$adjR^2$	*MSE*
1	X6	266.79	0.388	0.337
2	X6, X7	9.289	0.7695	0.2073
3	X6, X7, X8	6.455	0.7752	0.2048
4	X5, X6, X7, X8	5.051	0.7788	0.2031
5	X5, X6, X7, X8, X9	5.757	0.7792	0.2029
6	X1, X2, X5, X6, X7, X8	5.084	0.7818	0.2018
7	X1, X2, X5, X6, X7, X8, X9	6.171	0.7817	0.2018
8	X1, X2, X3, X5, X6, X7, X8, X9	8.032	0.7804	0.2024
9	X1, X2, X3, X4, X5, X6, X7, X8, X9	10.00	0.7789	0.2031

Note: *x1 - average rental bond in the retail trade-area; x2 - average monthly rents in the retail trade-area ; x3 - the average goodwill for retail trade-area ; x4-shop size: x5-goodwill; x6- rental bond; x7- the weight of monthly rents to the total rents ratio; x8-sales of shop; x9-population density*

This study selected the adjusted coefficient of determination (adjR^2) as the standard in selecting major variables, and selected the final model after considering the mean square error (MSE) and Mallows' C_p. In this case, the highest value of the adjusted coefficient of determination (adjR^2) would be the most ideal, whereas the lowest value was preferred for the mean square error (MSE) or Mallows' C_p. The Table 5 compares the Mallows' Cp, adjusted coefficient of determination (adjR^2), and mean square error (MSE) to the variables selected in the stepwise selection method, such as *rental bond, the weight of monthly rents to the total rents ratio, retail sales of shop*. As a result, the value of Mallows' Cp was lowest in the 6th step, whereas the adjusted coefficient of determination (adjR^2) was the highest. Also, the value of mean square error (MSE) was the lowest in the 6th step. Based on the finding that the variable inflation factor (VIF) for each selected variable was less than 2, this study determined the final scaled-down model.

Table 6: ANOVA (a) and Parameter Estimates (b)

(a) ANOVA

Source	**DF**	**Sum of Mean**	**Mean Square**	**F Value**	**Pr > F**
Model	6	22.276	3.712	91.17	0.000
Error	145	5.904	0.0040		
Corrected Total	151	28.181	**Dependent Mean**	2.651	
	Root MSE	0.201	**R-Square**	0.7905	
	Coeff Var	7.611	**Adj-Square**	0.7818	

(b) Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	*t*- Value	*Pr>t*	VIF
intercept	1	-118.51	7.588	-15.62	0.000	0
LN_average rental bond in the retail trade-area	1	0.239	0.122	1.95	0.052	9.17
LN_ average monthly rents in the retail trade-area	1	-0.236	0.140	-1.69	0.093	9.13
LN_goodwill	1	-0.086	0.043	-1.98	0.049	4.29
LN_rental bond of shop	1	0.716	0.038	18.75	0.000	2.94
LN_the weight of monthly rents to the total rents ratio	1	25.787	1.652	15.61	0.000	2.17
LN_retail sales of shop	1	0.214	0.074	2.88	0.004	3.89

The constant for the regression equation was -118.51, and the regression coefficient for the security rental bond was 0.239. Also, the *t-value* of security rental bond was 1.95, and the probability of significance was 10%, thereby rejecting H_0 from the hypotheses H_0: $\beta=0$, H_1: $\beta\neq0$, and $\alpha=0.01$. This means that rental bond was the variable that affected the monthly rent the most. Next, this study investigated the relative importance of variables in explaining monthly rent. Here, when t-value was employed to find out the weight of each explanatory variable, the importance decreased relatively among the variables according to the following order; rental bond(18.75), the weight of monthly rents to the total rents ratio (15.61), sales of shop (2.88), and goodwill of shop (-1.98).

The Table 6, based on the parameter estimate of the regression coefficient, produces the regression equation.

*Ln(ŷ) = -118.51 + 0.239× ln(*average rental bond in the retail trade-area) *- 0.236× ln(*average monthly rents*) - 0.086× ln(*goodwill*) + 0.716× ln(rental bond of shop) + 25.787× ln(*the weight of monthly rents to the total rents ratio*) + 0.214×ln(retail sales)* *(2)*

The Table 7 shows the results of multiple regression analysis based on Factor analysis data. The adjR^2 value indicates that about 41.5% of the variance in monthly rent is explained by the two predictor factors. The β values indicate the relative influence of the entered variables, that is, that characteristics of retail facilities have the greatest influence on monthly rent (β= 0. 650), followed by local economic conditions (β=0.033). The direction of influence for all two is positive. We conclude that the influence of characteristics of retail facilities is greater than the impact of local economic conditions, equally measured. Indeed, it seems that the effect of characteristics of retail facilities on monthly rent is approximately 20 times that of the local economic conditions (0.650/0.033).

Table 7: Component (Factor) Coefficient

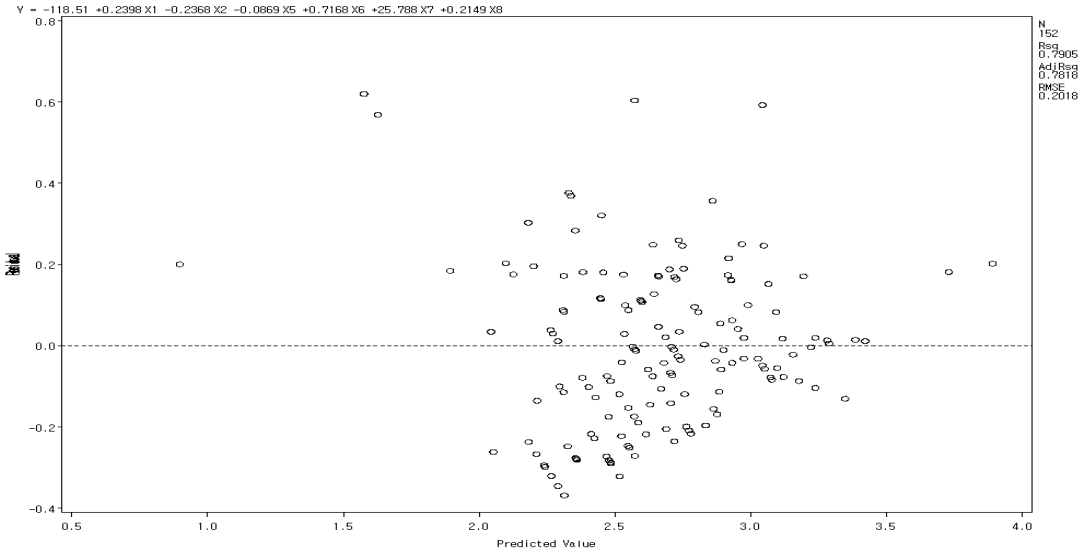
	Unstandardized Coefficients		**standardized Coefficients**	***t***	**Signif of *t***
	B	**Std.Error**	**Beta**		
intercept	15.586	0.468		33.296	0.000
Factor1 ***(Characteristics of the facility)***	4.904	0.470	0.650	10.442	0.000
Factor2 ***(Local economic conditions)***	0.248	0.470	0.033	0.527	0.598

Verification of the Model

A regression analysis was performed to verify the appropriateness of the final model in *Equation* (2). The regression analysis includes residual analysis, influence evaluation, and multi-collinearity, and this study was verified by mainly relying on residual analysis while using influence evaluation and multi-collinearity to aid the main analysis. Firstly, the value of *Hat Diag H* was not so large when the effect on the residual analysis was checked using influence as an option. Thus, this study concluded that the regression analysis was reliable. Secondly, independence of residue, homogeneity of variance, and normalization were investigated to review the suitability of the model using the chosen variables.

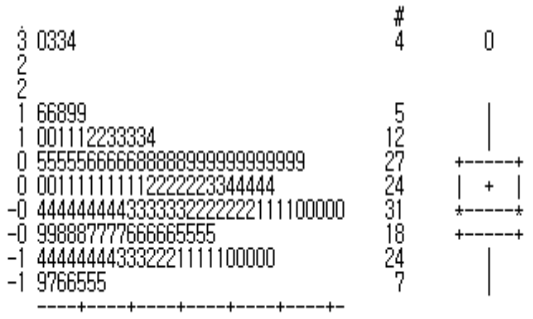
The value of *Durbin-Watson* was obtained to discover the independence of the residue. As the value is 1.841, this condition is also satisfied. In order to check the homogeneity of variables in residue, a residual plot was drawn.

Figure 4: Residual Plot

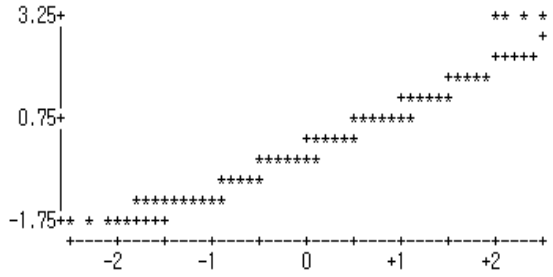


In addition, this study employed the histogram and normal probability to investigate the normalization of residue, which had a shape comparable to a normal distribution, thereby satisfying normalization. (Refer to the Figure 5)

Figure 5: Histogram (a) and Normal Probability of Residue (b)



(a)



(b)

Thus, as in the earlier analysis, the function of monthly rent is suited to the development of a monthly rent decision model with variables representing the Characteristics of retail facilities, local economic conditions and the performance of the franchised coffee shop. In choosing the variables, the adjusted coefficient of determination (adjR^2) was highest when the number of variables was 6, and the mean square error was the lowest. The figures showing the independence of residue, homogeneity of variance, and normalization were satisfactory when they were compared to the most appropriate model built by the chosen variables, and this study confirmed that the monthly rent of coffee shop is affected both by the rental bond and goodwill.

Conclusion

This study described in detail how certain variables are related to the characteristics of franchised coffee shops and how their location affects the determination of the monthly rent in Seoul. For the empirical model, it established a data set utilizing the coffee shop leases in Seoul. This study selected significant variables from among 6 variables related to the characteristics of the facility and locations using multiple regression analysis. According to the analysis, the following factors affecting the monthly rent of coffee shop were found to be significant: rental bond, goodwill, weight of monthly rents to the total rents ratio, and retail sales. Among them, rental bond, weight of monthly rent to the total rents ratio and retail sales were proportionally related to monthly rent, whereas the goodwill was inversely related to the monthly rent. Especially, rental bond, goodwill, and retail sales were found to be important explanatory variables in calculating the monthly rent of a franchised coffee shop.

When this study observed the statistics of the optimal model based on the 6 explanatory variables, each *P*-value for four explanatory variables (goodwill, rental bond, weight of monthly rent to the total rents ratio, and retail sales) was found to be below 0.05, so the finding was significant at 95% level or higher. Also, both

the adjusted coefficient of determination ($adjR_2$) at 0.78 and the value of *F* at 91.17 were rather high when compared to the results from previous studies. The residual analysis, influence evaluation, and Multi-collinearity analysis were performed as parts of the regression analysis, thereby satisfying the condition for the independence of residue. Also, the distribution of residue was close to normal, so the result satisfied normalization.

According to the factor analysis, we conclude that the influence of characteristics of retail facilities is greater than the impact of local economic conditions, equally measured. Indeed, it seems that the effect of characteristics of retail facilities on monthly rent is approximately 20 times that of the local economic conditions (0.650/0.033).

Other studies have mostly confined themselves to investigating limited variables representing the conditions of the retail trade-areas, such as the vacancy ratio, business cycles, and economic indicators but this study builds a comprehensive shop rent decision model with more detailed data at the level of the facility. Accordingly, this study, through an empirical analysis, has proved that the monthly rent of the franchised coffee shop in Seoul is significantly affected by rental bond, goodwill, and retail sales. Thus, this study has proved that one must consider the characteristics of retail facilities, local economic conditions and the performance of the franchised coffee shop when developing a monthly rent decision model for franchised coffee shop. Moreover, this study finds that it is vital to develop variables and models for shop images and brand in the future.

The paper has been revised based on the comments of the referee.

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