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The Relationship between Airbnb and the Hotel Revenue: In the Case of Korea

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Abstract

This study investigates the impact of Airbnb's listing on the hotel revenue in Korea. We use the panel regression model for this purpose. First, it finds that Airbnb's listing is not related to the hotel revenue. Even though the number of tourists is continuously increasing, most of them use hotels rather than Airbnb in Korea. Because the website of Airbnb has started from 2010 in Korea and has a low awareness, it has a less effect in Korea. The listing of Airbnb is rapidly growing in 2014. Given that the data of 2014 adds to the study, the result can be changed. Second, the estimate of the unemployment rate is strongly significant. If unemployment rate increases, the demand for hotel decreases. Because unemployment rate explains the present economic situation, the increase of the unemployment rate can imply a recession and the decrease of the trip can be followed. Third, the exchange rate has a positive effect on the hotel revenue, especially in Jeju. When the exchange rate is higher, the tourists from the abroad increase, and thus hotel revenue can increase. It implies that the tourists sensitively respond to the exchange rate. Forth, the estimates of the vacation dummy variable are strongly significant in Busan and Jeju. There is a ton of tourists in the holiday (especially summer) season, and thus it is common in the increase in the hotel revenue during this season.

Keywords: Airbnb, Class of Hotel, Hotel Revenue, Macroeconomic Variables

1. Introduction

The tourism industry is consistently growing in spite of the global economic recessions. According to the World Tourism Organization (UNWTO), the number of international tourists reached 1.138 million in 2014, and the figure shows the increase in 52 million more than in 2013. The tourism industry has a strong link with other service industries by creating jobs and earning foreign exchange and so on, therefore, many countries concerns and focuses on developing tourism industry. In[3] argued tourism development can stimulate and promote other industries and the sustained growth in the international tourism can serve as an indication of the state of world peace and economic development. With regard to creating jobs and the influence on the social and economic development of a country, tourism is one of the important industries in the world[6].

When people plan a trip, they will consider many things such as transportation, accommodation, food,

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and entertainments. The mix of these factors is tourism product. Accommodation is one sector of the important conditions in planning a trip, and there are various types of accommodations in the world. To date, the accommodation is developed in various types, such as hotel, motel, hostels, guest house and others.

With the rise of the sharing economy and the development of the Information Technology, a new type of the accommodation was shown and that is Airbnb. Airbnb is an internet-based company that allows people to offer tourism accommodation. Since the launching of Airbnb from 2008, it has been mushrooming and threatening the traditional accommodations. In 2015, the rate of company growth is 90% in comparison to last year, and the company value of Airbnb is the next raking of Hilton Company. This is the higher level than Marriott and Starwood which are famous with the traditional hospitality company.

Airbnb is a peer-to-peer accommodation business model and it has shaken up the traditional hospitality industry. That means Airbnb has influenced on the traditional accommodation industry by providing a marketplace that permits a large-scale rental of places from ordinary people to others. Especially for the young people who are familiar with the technology devices and anxious to experience new world, Airbnb can be a good choice to experience locals' life and save the money at the same time. Airbnb focuses on the price-value relationship and travelers choose Airbnb for this reason. In other words, Airbnb offers a better value than similarly priced hotel brands[7]. Even though there are some problems such as illegal rentals, tax problems, and securities, Airbnb has dramatically grown and traditional hotel companies should admit that Airbnb can be their competitor.

It is clear that the rise and growth of Airbnb has the negative impact on the traditional hotel industry. Therefore, it is interesting to investigate whether the rise of Airbnb influences the hotel revenue or not, however, this kind of research has not been explored. A large number of articles insist that the main attraction of Airbnb is the low-priced accommodation. Thus, it may have the bigger impact on the revenue of budget hotels rather than other classified hotels.

This paper examines the effect of Airbnb on the hotel revenue. For the empirical analysis, the hotels are classified with the hotel classification of Korea, and 3 cities including Seoul, Busan and Jeju are selected.

2. Literature Review

Airbnb has started from 2008 in the USA and explains itself as "a trusted community marketplace for people to list, discover, and book unique accommodations around the world – online or from a mobile phone"[1].

Many people from more than 34,000 cities and 190 countries have posted their extra rooms and spaces and the guests from the world are looking for and renting their rooms and accommodations on this website for their travels.

The rise of Airbnb is the result of the development of technology and the sharing economy which is explained such as "collaborative consumption"[10]. The core of the sharing economy is peer-to-peer lending, people renting things from each other. People who have underused assets, in this case room or apartments, lend their assets and make extra money. With this idea, some businesses such as Uber and Airbnb have introduced and prevailed.

Airbnb based on the sharing economy has targeted the niche market of the traditional hospitality industry and the couching surfing. Airbnb is a website for people who want to rent out the accommodations. When users register on the list, they set a lower price than traditional accommodation, hotels. Because the hosts do not need to cover for primary fixed costs, such as rent and labor costs, they can be able to price their places very competitively[5].

The price is one of the main factors on the accommodation selection decisions[8] and low price of Airbnb appears to be a major draw in accommodation selection decisions[5]. Moreover, Airbnb attracts travelers that they can enjoy local life as well as low-priced accommodation.

Reference[12] examined the impact of Airbnb on the hotel industry and they found that a 1% increase in Airbnb listings resulted in a 0.05% decrease in quarterly hotel revenue in Texas. Airbnb in the UK announced that it has a positive economic impact in the UK by generating economic activity[1].

3. Methodology

3.1 Data

This paper builds panel dataset to investigate the relationship between hotel revenue and Airbnb's listing. The data of Monthly hotel revenue are collected from the Tourism Knowledge and Information System[11] and the data of Airbnb's listing from the Airbnb's homepage[1]. The macroeconomic data are obtained from the Economic Statistics System[2] and Seoul Money Brokerage Services[9]. The panel

data include hotel revenues from 3 cities, Seoul, Busan, and Jeju, over the period 05, 2010 to 12, 2013. According to Tourism Knowledge & Information System[11], hotel revenues from these 3 cities are ranked on the top[11]. Thus, these 3 cities are selected as the representative ones of Korea. Note that hotels are classified with 5 types according to the hotel classification of Korea; luxury, upscale, midscale, economy and budget.

Tables 1 to 5 show descriptive statistics for the variable used our analysis. Airbnb's mean in Tables is positive. This implies the listing of Airbnb is on the increase, consistently. Especially, Seoul has the increase in listings more than other cities. Seoul is the cumulative number of Airbnb listings 1367, but Busan and Jeju are the cumulative number of Airbnb listings 159 and 96, respectively. Airbnb was distributed mainly in Seoul. The Whole hotel revenue for Seoul is, on mean, 80 million won, while its mean is 13 million won and 19 million won for Busan and Jeju, respectively. A hotel in Seoul has larger revenue than one in other cities. Table 4 presents the descriptive statistics for the macroeconomic variables used. The mean of unemployment rate is 3.2% and the mean of one-dollar exchange rate is 1,120 won.

Table 1. Descriptive Statistics for Hotel Revenue and Airbnb unit: thousand Korean won

	Airbnb	Whole	Luxury	Upscale	Midscale	Economy	Budget
Mean	12.2878	39036.267	25165.542	6195.462	3908.606	636.9368	668.8476
Median	2	19011.421	14331.436	1446.969	1741.667	359.7765	614.8375
Maximum	99	109000.000	67835.594	21924.696	10865.987	1673.390	201.235.
Minimum	0	9470.871.	5832.161	384.3330	869.3860	42.01700	5.121000
Std. Dev.	21.6017	33119.200	19957.517	7436.089	3515.754	545448.5	576.6764
Skewness	2.2281	0.807060	0.7827	0.8472	0.7970	0.7188	0.5559
Kurtosis	7.3484	1.899656	1.9339	1.9273	1.8283	1.8288	2.1585

Note: The whole hotel revenue includes a Korean traditional Korean hotel and a hotel unclassified.

Table 2. Descriptive Statistics for Hotel Revenue and Airbnb in Seoul

	Airbnb	Whole	Luxury	Upscale	Midscale	Economy	Budget
Mean	31.0681	84255.419	52139.362	16410.784	8748.529	1374.306	596.7122
Median	28	82064.359	51907.984	15562.348	8609.933	1393.212	621.8770
Maximum	99	109000.000	67835.594	21924.696	10865.987	1673.390	855.3620
Minimum	0	57584.461	35277.804	11260.788	6350.384.	1006.575	371.4020
Std. Dev.	29.0023	12455.837	7928.077	2806.668	1178.521.	195.8870	128.5579
Skewness	0.6855	0.0165	0.0165.	0.1829.	0.0913	-0.283924	-0.1095.
Kurtosis	2.3987	2.3384	2.5025.	2.0244.	2.2908.	1.879883	2.0773.

Note: See Table 1

Table 3. Descriptive Statistics for Hotel Revenue and Airbnb in Busan unit: thousand Korean won

	Airbnb	Whole	Luxury	Upscale	Midscale	Economy	Budget
Mean	3.6136	13637.444	8849.096.	1456.411.	1490.906	382.0149	1353.197.
Median	0.5000	13500.018	8682.757.	1446.969	1447.081	359.7765	1432.015.
Maximum	16	23677.569	16623.388	2165.331	2763.991	561.0000	2012.352.
Minimum	0	9470.871.	5832.161.	870.123	869.3860	304.6050	570.4880
Std. Dev.	4.9519	2934.461	2199.443	293.7513	421.7361	63.97959	353.7648
Skewness	1.0534	0.9708	1.1382	0.2196	0.6047	0.9926	-0.3798
Kurtosis	2.6522	4.4662	4.8704	2.4633	3.2811	3.2492	2.5950

Note: See Table 1

Table 4. Descriptive Statistics for Hotel Revenue and Airbnb in Jeju

	Airbnb	Whole	Luxury	Upscale	Midscale	Economy	Budget
Mean	2.1818	19215.937	14508.167	719.1907	1486.385	154.4898	56.63384
Median	0	18667.809	14047.276	696.3785	1492.409	159.1655	38.96000
Maximum	17	31089.693	22947.130	1192.630	2507.609	257.4480	319.5200
Minimum	0	11187.284	8335.999	384.3330	871.3780	42.01700	5.121000
Std. Dev.	3.6807	4847.115	3548.925	216.7478	367.8013	53.79108	58.19193
Skewness	2.2371	0.4561	0.4289	0.3026	0.4316	-0.2370	2.5507
Kurtosis	8.1771	2.8154	2.8549	2.2331	2.9563	2.4706	10.799

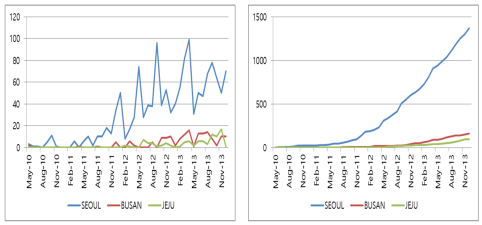
Note: See Table 1

Table 5. Descriptive Statistics for Independent Variable

	Unemployment Rate	Exchange rate (Korean won)
Mean	3.2727	1120.162
Median	3.2000	1122.900
Maximum	4.5000	1212.330
Minimum	2.7000	1056.670
Std. Dev.	0.4195	37.2302
Skewness	1.0811	0.2976
Kurtosis	3.7843	2.8228

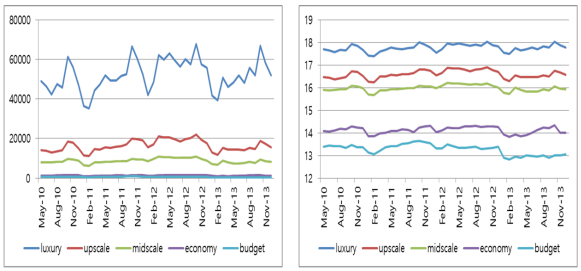
Figure 1 and Figure 5 contain the graphs of the Airbnb listings, hotel revenue and ln hotel revenue in each city. All three cities exhibit upward trends in the cumulative counts of Airbnb listings, but Airbnb listing in Seoul has increased dramatically during 2011 ~ 2013. While Busan and Jeju show a steady rise in the cumulative counts of Airbnb listings. For the case of the luxury hotels, hotel revenue in Seoul is much bigger than one in other cities. All three cities' hotel revenues show some interesting seasonal patterns during the analysis period.

Monthly hotel revenue in Seoul, Busan and Jeju has increased during the summer, but decreased during the winter.



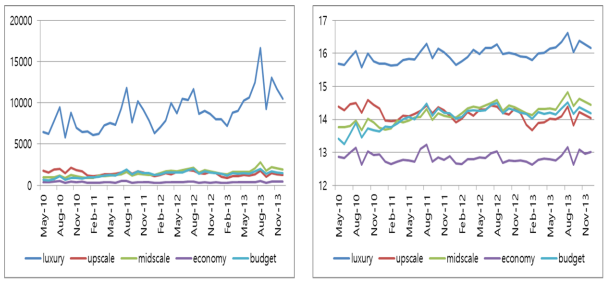
a. Monthly Airbnb listings b. Cumulative counts of Airbnb listings in the three cities

Figure 1. Airbnb of each city.



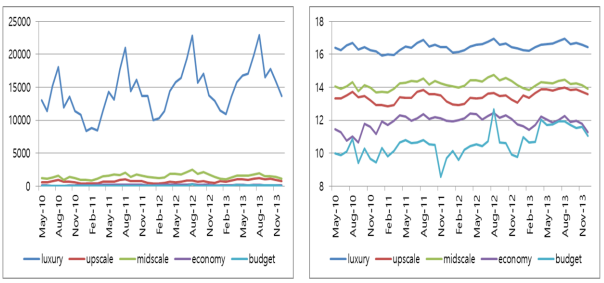
a. Hotel revenue (unit: thousand Korean won) b. Ln hotel revenue

Figure 2. Hotel revenue in Seoul.



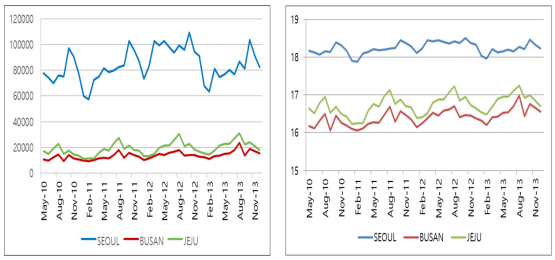
a. Hotel revenue (unit: thousand Korean won) b. Ln hotel revenue

Figure 3. Hotel revenue in Busan.



a. Hotel revenue (unit: thousand Korean won) b. Ln hotel revenue

Figure 4. Hotel revenue in Jeju.



a. Hotel revenue of each city (unit: thousand Korean won)

b. Ln hotel revenue of each city

Figure 5. Hotel revenue of each city.

3.2 Regression Model

We present a general panel model for the empirical analysis. The fundamental advantage of a panel analysis provides the researcher with great flexibility in modelling differences in behavior across individuals. The common panel data regression model of the form is

$$y_{i,t} = a + bx_{i,t} + \upsilon_i + \varepsilon_{i,t}$$

where y is the dependent variable, x is the independent variable, a and b are coefficients, and i and t denote for individuals and time. Here, the υ_i is very important in the panel analysis. Assumptions about this term determine whether fixed effects or random effects. The fixed effect model is that υ_i is unobserved, but correlated with $x_{i,t}$. This fixed effect model takes υ_i to be a group-specific constant term in the regression model. Unlike the random effects model, the υ_i is unobserved and can be assumed to be independent of $x_{i,t}$. This random effects model specifies that υ_i is a group-specific random variable[4].

In order to investigate the impact of the rise of Airbnb on the hotel revenues, we estimate the following panel model.

$$\ln y_{i,t} = c + \alpha \ln Airbnb_{i,t} + \beta Unem_t + \lambda \ln Exch_t + \delta Dum + \upsilon_i + \varepsilon_{i,t}$$

where $y_{i,t}$ is the hotel revenue, i subscript denotes the individual, t denotes time period, and $\varepsilon_{i,t}$ is error term. The Airbnb implies Airbnb's listing. The macroeconomic variables include 2 components; unem is an unemployment rate, exch is the won-dollar exchange rate. Dum is a vacation dummy variable where Dum = 1 if the vacation season, and 0 if not. We use a logarithmic transformation to dependent and independent variables except for unemployment rate. In our model specification, we would expect α to be negative. If α is negative and significant, it means that the hotel revenue decreases as the number of Airbnb listings increase. We would expect β to be negative, and λ and δ to be positive. If β is negative and significant, it implies that the hotel revenue decreases as unemployment rate increases. And if λ and δ are positive and significant, it means that the hotel revenues increase as the number of foreign and domestic tourists increases.

We conduct the Hausman test for the above panel estimation model, and adopt the fixed effect model for the empirical analysis.

4. Empirical Results

Tables 6 to 9 present our main results. In Table 6 we measure the impact of Airbnb's listing on overall hotel revenue in Korea. Tables 7 to 9 demonstrate the impact of Airbnb's listing on the hotel revenue in each city, respectively. The empirical results in Table 6 present for overall hotel revenue and 5 types of hotel revenue in Korea. As a result, all coefficients α are not statistically significant. This implies that Airbnb's listing has no effect on hotel revenue. Unemployment rates are negatively related with hotel revue and are strongly significant regardless of types of hotels. This implies that higher unemployment rate decreases hotel revenue. In case of exchange rate, the coefficients λ in types of midscale and economy are positively significant except for other types such as whole, luxury, upscale, and budget. This means that if exchange rate increases, hotel revenue increases.

In the results of the city group, the Table 7 presents for the types of hotel revenue in Seoul. The coefficients α are not statistically significant except for the type of budget. This implies that Airbnb's listing has a negative effect only on budget hotel revenue, but its coefficient, -0.10, is relatively small.

The Table 8 presents for the types of hotel revenue in Busan. The coefficients δ are not statistically significant except for the types of upscale and midscale. This implies that Airbnb's listing has a negative effect on upscale hotel revenue and a positive effect on midscale hotel revenue. These coefficients, -0.07 and 0.09 mean that the effect of Airbnb's listing on hotel revenue of each type is too small and meaningless in the economic sense. The vacation dummy is positively related to hotel revenue of all types of hotels. This implies that there are a ton of tourists in the holiday (especially summer) season, thus it is common in the increase in hotel revenue during this season.

The Table 9 presents for the types of hotel revenue in Jeju. The coefficients α are not statistically significant in Jeju regardless of types of hotels. This implies that

Airbnb's listing has no effect on hotel revenue. In case of exchange rate, the coefficients λ except for type of upscale are positively significant. This implies that the change in exchange rate influence to foreign tourists who have impact on hotel revenue in Jeju. The vacation dummy has a positive effect on overall hotel revenue in Jeju.

Overall, contrary to expectation, all the coefficients of Airbnb's listing except for some types of hotels are not statistically significant. As a result, we conclude that the size of the significant coefficients is rather small and thus Airbnb's listing has no effect on hotel revenue in Korea. Most of coefficients of unemployment rate have a negative effect in all cities regardless of types of hotels. Exchange rate with the significant and positive coefficient has a great effect on hotel revenue in Jeju. The vacation dummy variable is significant and positive. We expect that the hotel revenue in Busan and Jeju increases during the vacation season.

Table 6. The Impact of Airbnb on Hotel Revenue in Korea

	Whole	Luxury	Upscale	Midscale	Economy	Budget
	coef/se	*coef/se*	*coef/se*	*coef/se*	*coef/se*	*coef/se*
ln Airbnb's listing	0.023	0.021	0.018	0.027	-0.005	-0.012
	(0.015)	(0.016)	(0.021)	(0.018)	(0.018)	(0.048)
Unemployment	-0.235***	-0.249***	-0.234***	-0.173***	-0.178***	-0.307**
	(0.044)	(0.046)	(0.064)	(0.052)	(0.054)	(0.143)
ln Excahnge	0.869	0.672	1.016	1.339**	1.703***	1.538
	(0.539)	(0.566)	(0.775)	(0.639)	(0.653)	(1.747)
Dummy	0.153***	0.159***	0.089	0.137***	0.158***	0.307**
	(0.040)	(0.042)	(0.058)	(0.048)	(0.049)	(0.130)
_cons	12.006***	13.023***	8.747	6.190	1.861	3.141
	(3.758)	(3.949)	(5.407)	(4.456)	(4.553)	(12.188)
R^2 within	0.448	0.442	0.229	0.294	0.298	0.145

Note: The whole hotel revenue includes a Korean traditional Korean hotel and a hotel unclassified. Standard errors are shown in parentheses. Significance levles: ***1%, ** 5%, * 10%.

Table 7. The Impact of Airbnb on Hotel Revenue in Seoul

	Whole	Luxury	Upscale	Midscale	Economy	Budget
	coef/se	*coef/se*	*coef/se*	*coef/se*	*coef/se*	*coef/se*
ln Airbnb's listing	0.012	0.007	0.014	0.012	-0.008	-0.101***
	(0.016)	(0.016)	(0.020)	(0.017)	(0.018)	(0.026)
Unemployment	-0.179***	-0.213***	-0.162**	-0.081	-0.192***	-0.175*
	(0.055)	(0.054)	(0.069)	(0.057)	(0.058)	(0.088)
ln Excahnge	0.696	0.505	0.804	1.127*	1.042	1.551
	(0.621)	(0.613)	(0.783)	(0.649)	(0.656)	(1.002)
Dummy	-0.031	-0.037	-0.054	-0.011	0.049	-0.008
	(0.050)	(0.049)	(0.063)	(0.052)	(0.053)	(0.081)
_cons	13.922***	14.906***	11.462**	8.304*	7.452	3.254
	(4.357)	(4.297)	(5.493)	(4.555)	(4.598)	(7.029)
R^2 within	0.293	0.355	0.195	0.125	0.289	0.401

Note: See Table 5.

Table 8. The Impact of Airbnb on Hotel Revenue in Busan

	Whole	Luxury	Upscale	Midscale	Economy	Budget
	coef/se	*coef/se*	*coef/se*	*coef/se*	*coef/se*	*coef/se*
ln Airbnb's listing	0.020	0.025	-0.070*	0.091**	-0.037	0.042
	(0.030)	(0.038)	(0.038)	(0.041)	(0.027)	(0.043)
Unemployment	-0.208**	-0.220**	-0.241**	-0.183	-0.121	-0.090
	(0.084)	(0.104)	(0.104)	(0.113)	(0.075)	(0.118)
ln Excahnge	-1.035	-1.440	1.951	-2.254	-0.772	-2.754*
	(1.061)	(1.321)	(1.321)	(1.430)	(0.950)	(1.489)
Dummy	0.318***	0.355***	0.204**	0.277***	0.270***	0.312***
	(0.073)	(0.091)	(0.091)	(0.099)	(0.066)	(0.103)
_cons	24.311***	26.747***	1.277	30.496***	18.657***	33.658***
	(7.375)	(9.181)	(9.179)	(9.937)	(6.600)	(10.347)
R^2 within	0.654	0.602	0.490	0.558	0.587	0.467

Note: See Table 5.

Table 9. The Impact of Airbnb on Hotel Revenue in Jeju

	Whole	Luxury	Upscale	Midscale	Economy	Budget
	coef/se	*coef/se*	*coef/se*	*coef/se*	*coef/se*	*coef/se*
ln Airbnb's listing	0.039	0.037	0.134	-0.019	-0.002	0.313
	(0.028)	(0.025)	(0.078)	(0.032)	(0.065)	(0.220)
Unemployment	-0.333***	-0.315***	-0.234	-0.374***	-0.261*	-0.436
	(0.062)	(0.056)	(0.173)	(0.070)	(0.144)	(0.490)
ln Excahnge	2.167**	2.098**	-0.900	5.128***	7.218***	-1.592
	(0.951)	(0.860)	(2.653)	(1.076)	(2.209)	(7.512)
Dummy	0.292***	0.285***	0.249	0.186***	0.127	0.865*
	(0.059)	(0.053)	(0.163)	(0.066)	(0.136)	(0.463)
_cons	2.604	2.744	20.391	-20.524***	-37.829**	23.021
	(6.594)	(5.963)	(18.395)	(7.459)	(15.312)	(52.084)
R^2 within	0.871	0.884	0.469	0.833	0.559	0.412

Note: See Table 5.

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