

DETERMINANTS OF HOTEL REVENUE PER AVAILABLE ROOM IN PERU: AN ANALYSIS BY ACCOMMODATION CATEGORY

M. H. Alvarado Anampa^{1*}, M. Escobar-Soldevilla¹, V. G. Sánchez Araujo¹, J. L. De la Cruz Ccora¹, C. Dueñas Jurado¹, K. E. Madrid Gómez¹, F. Gomez De La Cruz¹, W. F. Paco Huamani¹, J. C. Ayuque Rojas¹

¹Universidad Nacional de Huancavelica, Huancavelica, Perú

*Corresponding Author: Max Henry Alvarado Anampa

*Universidad Nacional de Huancavelica, Huancavelica, Perú

Abstract

Determining the price or rate per room to be charged to customers is a fundamental decision for hotel managers. It is common for hotels to frequently change the price of their rooms based on various factors such as market demand, occupancy rate, vacation time, competition, among other factors. In this regard, a model of the data panel type has been specified; whose cross-sectional dimension included three accommodation segments and the temporary dimension covered from January 2014 to December 2021; this in order to analyze the influence of the occupancy rate and the average rate per room on revenue per available room (RevPar). For this, a balanced data panel was built with monthly information from STR. It was found that the grouped regression is the most appropriate to explain the behavior of the RevPar; evidencing the absence of differentiating characteristics in terms of RevPar between lodging categories. The empirical results showed a direct and significant effect of the occupancy rate and the average room rate on RevPar.

Keywords: Revenue per available room, Hotel occupancy rate, Average rate per room sold, Panel data model

1. Introduction

The performance of the main management indicators in the hotel industry is of vital importance for hotel managers. Among the main indicators are the occupancy rate and income per available room; This last metric is usually used as an indicator of financial profitability for a given period. In such a context, if the performance of a particular accommodation improves, this is associated with a better performance in the occupancy rate, as well as an improvement in the levels of income per available room (RevPar). RevPar is defined as the relationship between total revenue from rooms sold or occupied and the total number of rooms available for a period of time (Chattopadhyay & Mitra, 2019).

Among the main objectives of the hotel industry is the maximization of its financial profitability measured by RevPar. For this, the adoption of strategies aimed at the proper management of the income received mainly from the sale of available rooms is relevant. In this regard, the average daily rate (ADR) relates the total revenue obtained by the rooms to the total number of occupied

rooms; Therefore, this indicator provides an average rate paid per room sold during a given period of time.

Now the RevPar for a particular accommodation is directly related to the ADR and its occupancy rate (Pan, 2007). Therefore, increasing profits involves evaluating possible adjustments to rates per available room and fluctuations in demand. Faced with this, variations in room rates can generate a negative impact on perceived benefits. However, the hotel occupancy rate is also affected by the supply and demand conditions for a particular geographic area or market, an aspect that is common to the entire hotel industry.(Chattopadhyay & Mitra, 2019).

Consequently, hotel revenues will be constantly influenced by demand conditions and the price per available room.(Vinod, 2004). Likewise, demand uncertainty also influences investment decisions regarding hotel infrastructure.(C.-M. Chen & Lin, 2013). All these aspects, regarding the relevance of the determinants of hotel financial profitability, constitute one of the main concerns in terms of research within the hotel industry.(Assaf et al., 2012)

Now taking into consideration the hotel industry of Peru as a case of analysis, the present study aims to examine the incidence of the average daily rate per room (ADR) and the hotel occupancy rate (TNOH) on the income per available room (RevPar). In this regard, the management of hotel revenues and the evaluation of operational performance in scenarios with changing market dynamics; among which the type of market economy, the level of competition and market conditions, among others, stand out; has necessarily involved a decisional study process with non-linear characteristics(Choi & Cho, 2000; Madanoglu & Ozdemir, 2016). Under this consideration, recent literature has not evidenced studies regarding non-linear relationships between the price of hotel services and growth of the hotel industry for the Peruvian case; as well as between the price of hotel services and the number of competitors in the market. Most studies have focused on the analysis of linear relationships between the determinants of hotel financial profitability.

Following this methodological perspective of analysis, a study is established from an approach that addresses the possible presence of unobservable heterogeneity present among the various lodging categories. In this sense, the use of panel data models is a useful tool; within the range of econometric methodologies; to analyze and evaluate the presence of unobservable characteristics associated with each transversal study unit. Therefore, this type of econometric modeling allows estimating the presence of differential characteristics between lodging categories; as well as determine the marginal impact of ADR and TNOH on RevPar; prior evaluation of the statistical significance of its parameters.

Specifically, the objective of this study is to address the following questions: what is the impact of ADR and TNOH on RevPar for the hotel industry in Peru?, and is there the presence of unobservable heterogeneity in the lodging categories in Peru? Peru's hotel industry? In this context,

this research focuses on the analysis of RevPar, as an indicator of financial profitability, based on its two main determinants: ADR and TNOH, an indicator that has great relevance for the management of hotel revenues (Chattopadhyay & Mitra, 2019). However, the scope of this research does not include the study of seasonal or trend patterns. But the research contribution lies in the evaluation of the linear relationships of RevPar based on its determinants from a perspective by lodging category, using the Peruvian hotel industry as a case of analysis.

The rest of the document is organized as follows: Section II reviews the literature on hotel revenue management based on its main determinants. Section III presents the research methodology developed in this case study. Section IV presents the empirical results found and the details of the analysis carried out. In Section V the discussion of results is presented, and finally, in Section VI the main conclusions of the analyzed case are developed.

2. Literature Review

In various studies, the main hotel revenue management measures to measure accommodation performance are ADR, RevPar and occupancy rate, among others.(Hung et al., 2010). In this regard, the occupancy rate and the ADR are the main determinants of the RevPar, this is because the RevPar is determined by the product between the hotel occupancy rate and the ADR.(Cross et al., 2009). RevPar has become a relevant measure of hotel financial performance(Ismail et al., 2002); and is analyzed as a dependent or endogenous variable(Altin et al., 2017). In this way, the predicted relationships between the ADR, the demand in terms of the hotel occupancy rate and the RevPar is essential not only to determine and evaluate the performance of a hotel, but because it allows having a reference point for comparison with the competition within the hotel industry(Mauri, 2013; Chattopadhyay & Mitra, 2019).

RevPar is usually used as an indicator of financial profitability in the hotel industry. This hotel management ratio is usually used to evaluate, adjust and/or maintain prices; which is complemented by an analysis of the occupancy rate(Bhamornsathit & Katawandee, 2016). RevPar is estimated by the relationship between room revenue and the total number of available or total rooms in the establishment. However, this indicator can also be obtained through the product between the average daily rate (ADR) and the occupancy rate (TNOH).(Bravo Zúñiga & Canto Briceño, 2021, p. 9).

In relation to the hotel occupancy rate (TNOH)Rondi (2019)defines it as a management indicator that allows evaluating hotel performance¹. Being a ratio that allows observing and evaluating the results of hotel management. It is important to note that this indicator is affected by the seasonal components observed in the hotel market. The main factors being the presence of high and low seasons(Rondi, 2019, p. 150). For his part,Sánchez et al. (2017), express that in the hotel industry the hotel occupancy rate, together with the price level, allow reference to the levels of income received per available room. Such a result is consistent with the fact that the provision of

¹This rate is estimated by the quotient between the number of occupied rooms and the number of available rooms.

complementary services to traditional lodging is shown as an alternative way of approaching the analysis of hotel profitability; suggesting for this purpose to consider all the business units that make up the hotel company (Carmona, 2012; Dunn & Brooks, 1990).

Regarding the price or Average Daily Rate (ADR), this ratio is defined as an internal financial indicator and not as an indicator that enables a comparative market analysis. (Bagnera, 2016). Consequently, the ADR allows information regarding the average amount paid by clients, considering for this purpose only the rooms enabled to be sold in a specific period of time. The ADR is calculated by the quotient between the sum of revenue per room and the total number of rooms sold or occupied for a period of time.² (Bravo Zúñiga & Canto Briceño, 2021, p. 8).

On the other hand, the growth of the hotel industry is essential for its development and sustainability. There are studies that identify various factors that can influence the growth rate of the hotel industry. Among the most relevant are the size of the company, age, and location, among other factors. (Barros, 2005; Park & Jang, 2010). In this regard, it is important to note that price can positively influence the growth rate of hotel companies; In this sense, a positive price variability will directly impact the estimated growth rate. (Skalpe & Sandvik, 2002; Falk & Hagsten, 2015). However, prices can be affected by various factors exogenous to hotel companies, which can negatively influence their growth prospects.

A no less important factor that is closely linked to prices is the quality of the hosting services. In the hotel industry, various studies suggest that a high price of lodging services will be linked to a high quality of the hotel services provided to customers; and this aspect would reveal that tourists' willingness to pay increases the higher the quality of the hotels. (Nayyar, 1990; Henley et al., 2004; Chiu & Chen, 2014).

On the other hand, it is observed that hotel prices are also influenced by the level of local competition. (Falk & Hagsten, 2015). In such a context, hotel prices will increase in the presence of fewer nearby competitors. Consequently, a greater number of nearby competitors will negatively impact the price level of hotels. (Gan & Hernandez, 2013; Chattopadhyay & Mitra, 2019). From these considerations it can be established that the interaction between demand and the determinants of supply influence the establishment of the price level in the hotel market. (Baum & Haveman, 1997; Min et al., 2002; Chattopadhyay & Mitra, 2019).

For their part, hotel occupancy rates positively influence the price per available room. In addition, prices may differ widely within the same geographic area, location and according to specific attributes of the accommodation such as size, location, seasonality, among other aspects; that influence hotel price levels (Thrane, 2007; Becerra et al., 2013; Chattopadhyay & Mitra, 2019).

²Although the ADR is similar in its estimation to the RevPar, the latter differs in that its calculation is determined based on all available rooms.

Finally, revenue per available room (RevPar) tends to be higher in locations with greater availability of hotels or high-end serviced accommodations (Canina et al., 2005; Chattopadhyay & Mitra, 2019).

From the review of the literature regarding forecasting models applied to hotel revenue management, it is stated that the majority of studies are based on linear regression approaches to capture the relationships between the variables that determine RevPar (ADR and TNOH). . In this context, for the purposes of analysis and econometric modeling, the number of available rooms is taken as a proxy for hotel supply and as a proxy for demand.³ of lodging services to the hotel occupancy rate.

3. Methodology

This section provides the details of the description of data, variables and model used in the study.

3.1. Description of variables and data

For this research, two independent variables have been used to explain the variability of revenue per available room (RevPar). The explanatory variables include the average daily room rate ADR and the hotel occupancy rate (TNOH). The data contained in the study variables were compiled on a monthly basis.

The required data was collected from Smith Travel Research (STR) accommodation statistics for the period from January 2014 to December 2021, making a total of 216 observations per study variable.

3.2. Panel data model specification

Econometric modeling contemplates the specification of a panel-type linear model with three study variables; one endogenous and two explanatory, where the subscript will denote the transversal unit “lodging category”; and the subscript the temporal dimension, with the purpose of determining, evaluating and explaining “*i*” “*t*” causal relationships between the variables studied (Larios et al., 2016). Panel data models allow us to evaluate and understand the dynamics of the variability of repeated cross-sectional observations in a pre-established time horizon. (Torres, 2007). Following this methodology, this work used the following econometric specification of the panel data type:

$$\text{RevPar}_{it} = \beta_0 + \beta_1 \text{TNOH}_{it} + \beta_2 \text{ADR}_{it} + \varepsilon_{it}$$

Where “*i*” indicates the accommodation category (Midscale and Economy, Upscale and Upper Midscale, Luxury and Upper Upscale), “*t*” the month, “RevPar_{it}” the monthly income per available room, “ β_0 ” the intercept of the equation, “ β_j ” the quantification of the partial effect of

³The real hotel demand can be determined by the product of the occupancy rate and the number of available rooms.

the explanatory variable “j” on the dependent variable, “TNOHit” specifies the hotel occupancy ratio by accommodation category “i” in period “t”, “ADRit” indicates the rate average per room sold by accommodation category “i” in period “t”, and “ ϵ_{it} ” shows the random disturbance of the equation.

It should be noted that the data has been grouped into three lodging segments: Midscale and Economy, Upscale and Upper Midscale; and Luxury and Upper Upscale⁴. Then, given the present methodology, three types of specifications were carried out: A grouped model, a fixed effects model and finally a random effects specification. Subsequently, the various diagnostic tests were executed, related to the static data panel type models, with the purpose of choosing the best model and obtaining the most appropriate parameters (estimators). It is important to mention that the dynamics of this type of modeling is to exploit both the transversal and temporal variability that occurs in the units of analysis; However, the equation does not include seasonal or trend components⁵.

4. Estimation and analysis of results⁶

From the objectives set in this study, it is expected to achieve a value of the estimators, $\beta_j > 0$, which will show the partial (marginal) effects of the explanatory variables (TNOH and ADR) on the RevPar. Given the treatment methodology for this type of models, the first procedure consists of validating the structure of the error term, which implies confirming whether the error term contains an unobservable element, specific to each transversal unit or lodging category, additional to that term. that varies both between transversal and temporal units. From the Breusch-Pagan test⁷The following result was obtained (see graph 1):

Figure 1 Breusch-Pagan Test Results Window

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Breusch and Pagan Lagrangian multiplier test for random effects

REVPAR[categoria,t] = Xb + u[categoria] + e[categoria,t]

Estimated results:

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	Var	sd = sqrt(Var)
REVPAR	15278.43	123.606
e	355.0488	18.84274
u	0	0

```
Test:  Var(u) = 0
          chibar2(01) = 0.00
          Prob > chibar2 = 1.0000
```

⁴The grouping responds to its feasibility of categorization and availability of data regarding RevPar and ADR.

⁵An extension to this model is the incorporation of dummy variables that allow capturing the seasonal dynamics for each month of the years studied.(Fox, 2015).

⁶The results windows have been processed with the Stata program.

⁷This test establishes the hypothesis that the variance of the unobserved component is equal to zero.

Source: self made.

The results in graph 1 confirm that the error structure requires a single component; whose variability is concentrated between transversal units and over time, omitting the presence of unobservable agent-specific effects in the sample. Therefore, the efficient estimators are those provided by the least squares method.⁸, with respect to those obtained by the generalized least squares method⁹. In light of this result, the subsequent step consists of estimating the equation using the fixed effects technique, in order to contrast the significance of the fixed effects associated with each transversal unit of analysis or lodging category for the present case study.

Chart 2 Fixed effects regression results window

Fixed-effects (within) regression		Number of obs	=	216		
Group variable: categoria		Number of groups	=	3		
R-sq:		Obs per group:				
within	= 0.9565			min	=	72
between	= 0.9999			avg	=	72.0
overall	= 0.9771			max	=	72
corr(u_i, Xb) = -0.5951		F(2,211)	=	2322.50		
		Prob > F	=	0.0000		
REVPAR	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
TNOH	2.920087	.1243762	23.48	0.000	2.674908	3.165266
ADR	.5901201	.0147397	40.04	0.000	.5610642	.6191761
_cons	-168.4378	6.015004	-28.00	0.000	-180.295	-156.5806
sigma_u	1.9491876					
sigma_e	18.842738					
rho	.01058758	(fraction of variance due to u_i)				
F test that all u_i=0: F(2, 211) = 0.37				Prob > F = 0.6885		

Source: self made.

Figure 2 shows the results of the fixed effects regression. The results reported in the F statistic, associated with the significance of the fixed effects, confirm that the dichotomous variables associated with each unobservable effect of the *i*th accommodation category are not significant.¹⁰ Which allows us to conclude that the estimators provided by the least squares method (pooled model) prevail over those obtained by the fixed effects model. These results confirm the absence of unobservable heterogeneity in the sample linked to the three lodging categories analyzed in the

⁸Grouped or pooled model.

⁹Random effects model.

¹⁰A probability (Prob > F = 0.6885) greater than 1%, 5% and 10% of significance is reported; which would indicate that fixed effects are not significant. This result indicates that the dichotomous variables associated with the unobserved effect of the *i*th accommodation category are statistically equal to zero.

present study. Therefore, these results would indicate that the estimators provided by the Ordinary Least Squares (OLS) method are the most appropriate.

Chart 3 Results window for robust OLS regression in the presence of heteroscedasticity (pooled model)

Linear regression		Number of obs	=	216
		F(2, 213)	=	2569.69
		Prob > F	=	0.0000
		R-squared	=	0.9771
		Root MSE	=	18.787

REVPAR	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
TNOH	2.948405	.1575353	18.72	0.000	2.637877	3.258933
ADR	.5836687	.0116302	50.19	0.000	.5607436	.6065937
_cons	-167.7426	7.901394	-21.23	0.000	-183.3175	-152.1677

Source: self made.

Having determined the prevalence of OLS estimation compared to the other specifications, it is pertinent to evaluate the presence of correlation, heteroscedasticity and multicollinearity problems. In this regard, the results provided in Figure 3 provide a robust regression in the presence of heteroskedasticity; obtaining efficient estimators¹¹.

Table 1 Correlation matrix

	REVPAR	TNOH	ADR
REVPAR	1.0000		
TNOH	0.5258	1.0000	
ADR	0.9458	0.2626	1.0000

Source: self made.

Table 1 shows the correlation results between the study variables, specifying a limited correlation between TNOH and ADR, which suggests the absence of multicollinearity, providing such a result as evidence in favor of the fact that the variability of the regressors of the equation provide relevant information about the behavior of the endogenous variable (RevPar). Likewise, this matrix reports a high correlation between RevPar and ADR, which suggests that this last indicator has a relevant impact on the RevPar results.

Table 2 Variance inflation factor matrix

Variable	VIF	1/VIF
TNOH	1.07	0.931032
ADR	1.07	0.931032
Mean VIF	1.07	

¹¹Although in the presence of heteroskedasticity the OLS estimators remain unbiased, the t and F statistical tests lose validity; and the estimators are inefficient.

Source: self made.

Finally, Table 2 reports the results of the variance inflation factor for the regressors included in the equation, which confirm the absence of multicollinearity; because values less than 10 are observed, indicating that the equation does not present multicollinearity problems.

Based on these results provided by the estimate made by MCO, the following assertions can be made. First, the regressors TNOH and ADR are significant as determinants of RevPar. Such results indicate that the partial effects of the explanatory variables are relevant to explain the variability of RevPar, but with a different marginal impact on the endogenous variable. Likewise, it is specified that the partial impact of the explanatory variables has a direct (positive) meaning, a result that is in line with the theoretical postulates developed in the present study. Suggesting, therefore, that the higher the occupancy rate (TNOH), the greater the hotel financial profitability measured by RevPar. And similarly, an increase in average rates per room sold (ADR) will also have a positive impact on RevPar.

On the other hand, the empirical results suggest that TNOH is the indicator that has the greatest marginal impact on RevPar. For its part, the ADR estimator would show a limited impact on RevPar, compared to the marginal effect provided by the TNOH. The latter would suggest that TNOH is the most determining indicator of hotel financial profitability levels (RevPar). However, since the TNOH is a proxy for market demand, it would be determined exogenously. Being, therefore, outside the control of hotel managers. Therefore, if the objective is established on the maximization of hotel financial profitability, via the maximization of income per available room; The hotel variable or indicator that would be within the discretionary margins of control by the administrators would be the ADR.

Finally, the non-significance of the intercept is observed in the OLS regression, determining the absence of autonomous effects unrelated to the marginal effects of the TNOH and the ADR. This result confirms that the TNOH and ADR indicators are the main determinants of RevPar.

5. Discussion of results

From the analysis of the data by grouped regression, its results suggest that TNOH and ADR are the main regressors that explain the variability and/or behavior of RevPar, this regression method connoting in turn the absence of unobservable heterogeneity by category of lodging.

About Zheng (2014) specifies that although there is a high correlational significance between TNOH and RevPar, an accelerated increase in the occupancy rate in recessionary scenarios would negatively impact RevPar; This is because TNOH is influenced by environmental factors. For his part, Sainaghi (2011) points out that among the main determinants of RevPar is hotel capacity, and that added to the number of employees, the number of years of operation and market orientation,

among other factors, have a significant impact on RevPar. At the same time, Sainaghi et al. (2021). They also confirm the significance between hotel occupancy rate and RevPar. Adding that there are other factors such as the type and size of the lodging room, along with the location and seasonal pattern as other relevant factors that explain the differences in RevPar. Sánchez et al. (2017), on the other hand, confirms a significant relationship between the occupancy rate and prices or rates per room as determinants of RevPar. For his part, Ibañez et al. (2020) It is also consistent with the empirical results presented in the present study, which details the existence of a significant relationship between RevPar and TNOH.

Regarding the significance of ADR as a determinant of RevPar Chattopadhyay & Mitra (2019) point out that both the price or rate per room (ADR) and tourist demand show positive and significant effects on the behavior of RevPar. Likewise, they show that the seasonal pattern has a significant impact on RevPar. Such results are consistent with those evidenced in the present investigation. But they connote that if the objective is the maximization of profits, this is achieved only through the maximization of ADR.

Consequently, it can be specified that an adequate setting of the average daily rate (ADR) is the most relevant and critical decision to improve hotel profitability indices measured by RevPar. But, it is important to note that a limitation to the study carried out by Chattopadhyay & Mitra (2019), is the circumscription of the cultural and socioeconomic environment already pre-established by the country studied. Implying that any substantial change in some of the variables studied could affect the results obtained. In addition, prices are also susceptible to being influenced by changes in the socioeconomic and/or political scenarios inherent to the analyzed environment.

With everything explained so far, it is appropriate to specify that although RevPar is one of the most used hotel profitability indicators in the industry; There is debate as to its reliability, scope and limitations. Lee et al. (2019) express that the RevPar has presented limitations to adequately measure financial performance, circumstances that have led to the development of other alternative performance measures. In this regard, gross operating profit per available room (GOPPAR) has become a viable alternative that resolves some of the limitations contained in RevPar. In general, Lee et al. (2019) They note that RevPar is more useful than GOPPAR to analyze results at the company level, yielding mixed results at the property level.

For his part, Schwartz et al. (2017) They point out that there are conditions for the use of RevPar. In principle, they suggest that in lower category accommodations, and with the presence of income not related to the trade of available rooms; The use of GOPPAR becomes a more appropriate measure than RevPar. Similar evaluative position expresses Chen et al (2011), who suggest that the explanatory power of RevPar should be evaluated with respect to other financial ratios such as earnings per share, return on assets, and return on equity, among other financial management ratios.

Finally, the inclusion of other variables that allow for further study of RevPar variability is a fundamental aspect in the search for other determinants of hotel financial profitability. In this sense, factors such as location, market segment (Ismail et al., 2002), as well as those related to hotel performance ratings (Jolliffe & Farnsworth, 2003), the type of hotel infrastructure, the distance and the seasonal pattern (Schwartz & Webb, 2022), can emerge as those relevant factors to explain the levels of income per available room for a given hotel.

6. Conclusions

It is established in relation to the first research question that the empirical results confirm the existence of a direct and significant relationship of TNOH and ADR with RevPar. Being, therefore, its main determinants that would explain the variability of RevPar. Result that is consistent with the theoretical definition of RevPar.

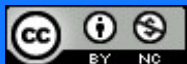
In relation to the second research question, the non-presence of differential characteristics in terms of RevPar between lodging categories studied at the level of the hotel industry in Peru is noted. A result that would confirm that the divergences between financial profitability levels, measured by RevPar, would be influenced mainly by environmental factors inherent to hotel demand (TNOH), and by pricing strategies linked to ADR regardless of the lodging category.

Consequently, in the model presented, the average daily rate (ADR) is the only instrument that has the potential to be controlled by hotel managers, with the aim of maximizing financial profitability. The other regressor (TNOH) will be influenced and/or determined by various environmental factors, remaining outside the control of hotel managers. Therefore, setting an adequate average daily rate (ADR) is a critical decision to improve profitability in the hotel industry, regardless of the lodging category in which the hotel is located. However, the inclusion of other variables such as seasonal and trend components, among others, is suggested in order to improve the explanatory and predictive capacity of the model.

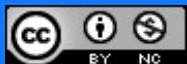
Bibliographic references

1. Altin, M., Schwartz, Z., & Uysal, M. (2017). "Where you do it" matters: The impact of hotels' revenue-management implementation strategies on performance. *International Journal of Hospitality Management*, 67, 46-52. <https://doi.org/10.1016/j.ijhm.2017.08.001>
2. Assaf, A.G., Josiassen, A., & Cvelbar, L.K. (2012). Does Triple Bottom Line reporting improve hotel performance? *International Journal of Hospitality Management*, 31(2), 596-600. <https://doi.org/10.1016/j.ijhm.2011.08.005>
3. Bagnera, S. (2016). An examination of online ratings on hotel performance indicators: An analysis of the Boston hotel market. <https://open.bu.edu/handle/2144/23786>
4. Barros, CP (2005). Measuring efficiency in the hotel sector. *Annals of Tourism Research*, 32(2), 456-477. <https://doi.org/10.1016/j.annals.2004.07.011>

5. Baum, J.A.C., & Haveman, H.A. (1997). Love Thy Neighbor? Differentiation and Agglomeration in the Manhattan Hotel Industry, 1898-1990. *Administrative Science Quarterly*, 42(2), 304-338. <https://doi.org/10.2307/2393922>
6. Becerra, M., Santaló, J., & Silva, R. (2013). Being better vs. Being different: Differentiation, competition, and pricing strategies in the Spanish hotel industry. *Tourism Management*, 34, 71-79. <https://doi.org/10.1016/j.tourman.2012.03.014>
7. Bhamornsathit, S., & Katawandee, P. (2016). An Analysis of Thai Listed Hotels: Financial and Operational Performance. *Journal of Business and Behavior Sciences*, 28, 55.
8. Bravo Zúñiga, FJ, & Canto Briceño, ME (2021). The collaborative platform Airbnb and its effect on the main performance indicators of the hotel industry in Lima between 2010 and 2019 [Peruvian University of Applied Sciences (UPC)]. <http://hdl.handle.net/10757/656330>
9. Canina, L., Enz, CA, & Harrison, JS (2005). Agglomeration Effects and Strategic Orientations: Evidence From The US Lodging Industry. *Academy of Management Journal*, 48(4), 565-581. <https://doi.org/10.5465/amj.2005.17843938>
10. Carmona Olmos, GH (2012). Hospitality competitiveness measurement system. *Journal of Global Business and Technology*, 8(2), 29-37.
11. Chattopadhyay, M., & Mitra, S.K. (2019). Determinants of revenue per available room: Influential roles of average daily rate, demand, seasonality and yearly trend. *International Journal of Hospitality Management*, 77, 573-582. <https://doi.org/10.1016/j.ijhm.2018.09.001>
12. Chen, C.-M., & Lin, Y.-C. (2013). The influence of uncertain demand on hotel capacity. *International Journal of Hospitality Management*, 34, 462-465. <https://doi.org/10.1016/j.ijhm.2012.11.008>
13. Chen, J., Koh, Y., & Lee, S. (2011). Does the Market Care About Revpar? A Case Study of Five Large Us Lodging Chains. *Journal of Hospitality & Tourism Research*, 35(2), 258-273. <https://doi.org/10.1177/1096348010384875>
14. Chiu, H.-H., & Chen, C.-M. (2014). Advertising, Price and Hotel Service Quality: A Signaling Perspective. *Tourism Economics*, 20(5), 1013-1025. <https://doi.org/10.5367/te.2013.0324>
15. Choi, T.Y., & Cho, V. (2000). Towards a knowledge discovery framework for yield management in the Hong Kong hotel industry. *International Journal of Hospitality Management*, 19(1), 17-31. [https://doi.org/10.1016/S0278-4319\(99\)00053-5](https://doi.org/10.1016/S0278-4319(99)00053-5)
16. Cross, RG, Higbie, JA, & Cross, DQ (Dax). (2009). Revenue Management's Renaissance: A Rebirth of the Art and Science of Profitable Revenue Generation. *Cornell Hospitality Quarterly*, 50(1), 56-81. <https://doi.org/10.1177/1938965508328716>
17. Dunn, K., & Brooks, D. (1990). Profit analysis: Beyond Revenue Management. *Hotel and Restaurant Administration Quarterly*, 31(3), 80-90.
18. Falk, M., & Hagsten, E. (2015). Modeling growth and revenue for Swedish hotel establishments. *International Journal of Hospitality Management*, 45, 59-68. <https://doi.org/10.1016/j.ijhm.2014.11.009>
19. Fox, J. (2015). *Applied Regression Analysis and Generalized Linear Models*. SAGE Publications, Inc.



20. Gan, L., & Hernandez, M.A. (2013). Making Friends with Your Neighbors? Agglomeration and Tacit Collusion in The Lodging Industry. *The Review of Economics and Statistics*, 95(3), 1002-1017. https://doi.org/10.1162/REST_a_00289
21. Henley, J.A., Cotter, M.J., & Herrington, J.D. (2004). Quality and Pricing in the Hotel Industry. *International Journal of Hospitality & Tourism Administration*, 5(4), 53-65. https://doi.org/10.1300/J149v05n04_03
22. Hung, W.-T., Shang, J.-K., & Wang, F.-C. (2010). Pricing determinants in the hotel industry: Quantile regression analysis. *International Journal of Hospitality Management*, 29(3), 378-384. <https://doi.org/10.1016/j.ijhm.2009.09.001>
23. Ibañez Pérez, RM, Almendarez-Hernández, MA, & Sánchez-Brito, I. (2020). Determinants of hotel occupancy of the main destinations of sun and beach in Mexico. *Noesis. Journal of Social Sciences*, 29(58-1), Art. 58-1. <https://doi.org/10.20983/noesis.2020.3.4>
24. Ismail, JA, Dalbor, MC, & Mills, JE (2002, December). Using RevPAR to analyze: Lodging-segment variability; the higher the RevPAR, the greater the volatility in a hotel investment--but there's also more money to be made. *Cornell Hotel & Restaurant Administration Quarterly*, 43(6), 73-. Gale OneFile: Hospitality and Tourism.
25. Jolliffe, L., & Farnsworth, R. (2003). Seasonality in tourism employment: Human resource challenges. *International Journal of Contemporary Hospitality Management*, 15(6), 312-316. <https://doi.org/10.1108/09596110310488140>
26. Larios-Meño, JF, González-Taranco, C., & Álvarez Quiroz, VJ (2016). Research in economics and business: Methodology with applications in E-Views (1st ed.). San Ignacio de Loyola University. <https://doi.org/10.20511/USIL.book/2527/9786124119774>
27. Lee, S., Pan, B., & Park, S. (2019). RevPAR vs. GOPPAR: Property- and firm-level analysis. *Annals of Tourism Research*, 76, 180-190. <https://doi.org/10.1016/j.annals.2019.04.006>
28. Madanoglu, M., & Ozdemir, O. (2016). Is it more better? The relationship between meeting space capacity and hotel operating performance. *Tourism Management*, 52, 74-81. <https://doi.org/10.1016/j.tourman.2015.06.005>
29. Mauri, A.G. (2013). *Hotel revenue management: Principles and practices*. Pearson Italia Spa.
30. Min, H., Min, H., & Chung, K. (2002). Dynamic benchmarking of hotel service quality. *Journal of Services Marketing*, 16(4), 302-321. <https://doi.org/10.1108/08876040210433211>
31. Nayyar, P.R. (1990). Information asymmetries: A source of competitive advantage for diversified service firms. *Strategic Management Journal*, 11(7), 513-519. <https://doi.org/10.1002/smj.4250110703>
32. Park, K., & Jang, S. (Shawn). (2010). Firm growth patterns: Examining the associations with firm size and internationalization. *International Journal of Hospitality Management*, 29(3), 368-377. <https://doi.org/10.1016/j.ijhm.2009.10.026>
33. Rondi, GR et al. (2019). Analysis of the main performance indicators used in hotel activity. 44.



34. Sainaghi, R. (2011). RevPAR determinants of individual hotels: Evidences from Milan. *International Journal of Contemporary Hospitality Management*, 23(3), 297-311. <https://doi.org/10.1108/09596111111122497>
35. Sainaghi, R., Abrate, G., & Mauri, A. (2021). Price and RevPAR determinants of Airbnb listings: Convergent and divergent evidence. *International Journal of Hospitality Management*, 92, 102709. <https://doi.org/10.1016/j.ijhm.2020.102709>
36. Sánchez Aguirre, DP, Maldonado Alcudia, MC, Martínez Vázquez, LD, Lara, G., Sánchez Aguirre, DP, Maldonado Alcudia, MC, Martínez Vázquez, LD, & Lara, G. (2017). Profitability of boutique hotels explained from the memorable experience. *The sustainable journey*, 33, 81-104.
37. Schwartz, Z., Altin, M., & Singal, M. (2017). Performance measures for strategic revenue management: RevPAR versus GOPPAR. *Journal of Revenue and Pricing Management*, 16(4), 357-375. <https://doi.org/10.1057/rpm.2016.23>
38. Schwartz, Z., & Webb, T. (2022). Resource Similarity, Market Commonality, and Spatial Distribution of Hotel Competitive Sets. *Journal of Hospitality & Tourism Research*, 46(4), 724-741. <https://doi.org/10.1177/1096348020988579>
39. Skalpe, O., & Sandvik, K. (2002). The Economics of Quality in the Hotel Business. *Tourism Economics*, 8(4), 361-376. <https://doi.org/10.5367/000000002101298188>
40. Thrane, C. (2007). Examining the determinants of room rates for hotels in capital cities: The Oslo experience. *Journal of Revenue and Pricing Management*, 5(4), 315-323. <https://doi.org/10.1057/palgrave.rpm.5160055>
41. Torres-Reyna, O. (2007). Panel Data Analysis Fixed and Random Effects using Stata. Princeton: Princeton University. <http://www.princeton.edu/~otorres/Panel101.pdf>
42. Vinod, B. (2004). Unlocking the value of revenue management in the hotel industry. *Journal of Revenue and Pricing Management*, 3(2), 178-190. <https://doi.org/10.1057/palgrave.rpm.5170105>
43. Zheng, T. (2014). What caused the decrease in RevPAR during the recession? An ARIMA with intervention analysis of room supply and market demand. *International Journal of Contemporary Hospitality Management*, 26(8), 1225-1242. <https://doi.org/10.1108/IJCHM-05-2013-0192>