INTERNATIONAL JOURNAL OF LATEST TECHNOLOGY IN ENGINEERING, MANAGEMENT & APPLIED SCIENCE (IJLTEMAS)

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

Rationalizing the Dynamic Hotel Room Pricing in ASEAN Region Using Panel Regression Analysis: Foundation for Revenue Management

Christian C. Aguado

Colegio de San Juan de Letran, Philippines

DOI: https://doi.org/10.51583/IJLTEMAS.2025.1408000201

Received: 10 Sep 2025; Accepted: 20 Sep 2025; Published: 25 September

Abstract— This study investigates the determinants of hotel room pricing in ASEAN member states using a dataset of 18,215 observations. The research extends the traditional hedonic pricing model by retaining only statistically significant predictors, thereby improving both explanatory accuracy and practical application. The findings highlight five critical determinants of hotel room pricing: hotel class, occupancy rate, room revenue, resort-town or beachfront location, and independence from major chains. Revenue per Available Room (RevPAR) demonstrates the strongest positive association, while independent hotels consistently price lower than chain-affiliated properties, underscoring the influence of brand strength. External geographic factors further enhance pricing power, confirming prior evidence on location-based premiums. In contrast, variables such as hotel size, franchise ownership, and generalized location categories were found to be statistically insignificant, streamlining the model and improving interpretability. Beyond methodological refinement, this research signals a shift in pricing strategy attitudes within the ASEAN hospitality sector. By aligning econometric rigor with industry relevance, the study advances both theory and practice. It demonstrates how robust statistical models can guide managerial decision-making, inform policy, and enrich classroom instruction. As a first step in the integration of econometric approaches into regional hospitality pricing, the framework provides a foundation for more precise, evidence-based strategies across both academic and professional domains.

Keywords— Hotel Room Price, Characteristics, KPI, ASEAN Region, Regression Model

I. Introduction

Tourism is an important part of a country's economy, and it is also a growing industry for many countries. The tourism industry is made up of many sectors, one of which is hospitality. Hotels have also been growing rapidly, especially in ASEAN where competition is starting to get intense. The World Travel & Tourism Council claims that tourism is a significant driver of economic recovery, and Statista's Market Forecast for 2024 claims that the hotel industry in Southern Asia is projected to reach $13.28 billion in 2025, and is expected to reach $16.41 billion in 2029, growing at 5.43% CAGR annually. This means that hotel room pricing, which is critical to the hotel revenue, must be strategically developed.

Hotel rooms are considered the most important assets a hotel has. However, empty rooms, which are not sold, depreciate and are considered a loss (Calinao et al, 2022). As such, pricing strategies should be employed in such a way that maximizes profit and occupancy. Several hotel attribute determinants influence pricing, such as hotel brand, location, tier and size (Jiang & Taylor, 2020; Calinao et al, 2022). The occupancy and revenue per available room (RevPAR) are some the metrics that are used to gauge the profitability and financial performance of a company (Hua et al, 2018). However, there is limited accessible literature that has addressed the pricing of hotel rooms across Southeast Asia (HVS Research, 2019).

This study fills in the gap in the literature by utilizing panel regression techniques on data covering the years 2014 to 2024. The availability of dataset facilitated building robust econometric models for hotel pricing in ASEAN. Previous works on hotel pricing have focused on customer satisfaction or sustainable development, while very few have analyzed hotel pricing using econometric techniques (Chica-Olmo & Zafra-Gomez, 2022). In contrast to the Philippine context where economists Morales & Villanueva (2021) and the Department of Tourism (2023) describe the use of panel data to study a single hotel over time, the method in question offers a more sophisticated approach by allowing the simultaneous study of multiple hotels over time.

The study is guided by the two objectives of: (1) determining the critical relationships between hotel characteristics, associated KPIs, and pricing, and (2) developing a rational pricing strategy model. The study uses secondary longitudinal data to analyze ASEAN hotels and focuses on critical pricing metrics such as RevPAR and occupancy. The data analysis, though guided solely by confidentiality policies and room revenue, contributes to an improved understanding of pricing determinants.

Throughout this research, and in both theory and practice, the researcher had identified and documented pricing strategies for hotels in ASEAN countries based on secondary data and regression analysis. This demonstrates the use of regression analysis in hospitality management, as well as its application to several other fields beyond tourism and hospitality.

In the ASEAN region, attentively analyzing each hotel's room pricing, considering bath amenities, service levels, location, and other relevant features within the hedonic pricing framework, contributes to the value assigning attributes of and pricing within hospitality. For instance, hedonic pricing and related assumptions were aptly employed to forecast the rates of beach resorts in Thailand by Tochwat and Likitanupak (2019) and they conclude that the rating of a resort, its position and other environment,

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

together with other geographical and physical attributes of the area play a dominant role in the revenue earned by the resort. In the same manner, Soler et al. (2022) has established evidence of the corresponding relationship among hotel category and location within the Algarve region and room rental rates. These works cited above testify to the ability of hedonic pricing theor to the pricing anomalies and the ASEAN hotel market as well.

On the other hand, hedonic pricing theory suffers from a lack of theoretical advancement. Within real estate, the developments in big data and big neural networks' predictive modeling remain predictive and do not advance theory (Zhang et al., 2021). Hospitality as a field of study has a greater reliance upon dynamic assumptions and, more such, fails to integrate proactive assumptions of relational time (Abrate et al., 2023). Developing hedonic pricing by integrating dynamic frameworks of architecture will address such gaps and enhance the theory application.

This analysis utilizes quantitative methods with a descriptive and longitudinal approach while obtaining secondary data. This dataset facilitates the study of the hotel's key characteristics, performance indicators, and pricing. The goals of the study are: (1) to analyze the relationships between hotel attributes and performance indicators with room prices and (2) to develop a more accurate pricing model. The data collected minimizes the time-consuming techniques of surveys and interviews while still providing strong evidence for econometric research.

All ASEAN member countries are included within the study region, with the Philippines, Singapore, Indonesia, Brunei, Thailand, Malaysia, Vietnam, Cambodia, Myanmar, and Laos. The use of panel regression in this case studies is justified as it accounts for both the cross-section at a particular point in time (spatial) and the changes in the same entity over time (temporal) (Beck & Katz, 1995). The econometric models used in this study are pooled OLS, fixed effects, and random effects (Cottrell & Lucchetti, 2023). Given the characteristics of the variables in the study, such as location and type of accommodation offered, fixed effects are more appropriate. The application of random effects estimation, as opposed to pooled OLS, is justified given the strong differences between the hotels in the sample and is proven through a Breusch-Pagan Lagrange Multiplier test. The dependent variable of the model is hotel room pricing, which is explained by the following six independent variables: hotel class, accommodation type, location, size, occupancy rate and RevPAR. Data preparation involved cleaning, recoding, and transformation of highly skewed data to log scale prior to analysis in SPSS and Gretl.

This research applies panel regression techniques, thereby extending the reach of hedonic pricing in the hospitality industry and providing pricing insights for hotels in ASEAN countries. This will assist hotel operational managers in formulating more reasonable pricing policies, while also contributing to the scholarly discourse on econometric work in tourism and hospitality. As Guillet and Mohammed (2023) argue, these methods improve the accuracy of revenue forecasting, which in turn improves profitability and revenue management in the context of a growing regional economy.

II. Results and Discussion

The regression analysis reveals a consistent, statistically significant relationship between the class of a hotel and the pricing of its rooms within the ASEAN region, suggesting class determination borders the apex of performance revenue. Upgrading a property's class increases room prices, and the impact is non-negligible. This is like the market, which has seen the rapid resurgence of the midscale to upper midscale and upper-tier hotel segments after the pandemic, due to enhanced guest trust and brand perception. Since the model empirically documents a higher price floor for each class, it re-affirms the old contention that segmentation based on classification is a price elastic durable barrier and shields a property over the price turbulence or broader economic downturn. Geographically, the ASEAN region is relatively simple, which is that the class and the resulting positioning a hotel decides to pursue will determine its room pricing in all countries aligned to the ASEAN principles. This is why, bolstered by strong regressions, the research transforms the traditional belief of the pricing power of hotel class as a segmentation variable into quantifiable hypotheses and forecasts as to the benefits attached to ascending the classification grade system.

The information brought forth in this document further sustains the idea of controlled dynamic pricing while providing the necessary schedule to players in the hotel industry to determine when to optimize the price of hotel room supply, how to adjust the precision of market segment targeting, and when to anticipate demand shifts throughout the ASEAN region.

The analysis demonstrates that the operations of a hotel greatly influence the prices displayed to guests, especially in the ASEAN region. Overall, chain-managed properties command higher room prices relative to independent properties, who sit on average five percent lower, a wide gap. Some of that gap stems from the structural advantages chains possess, which include industry-leading brand recognition, centralized booking systems, shared marketing spend, and economies of scale cost reductions. Franchised hotels behave almost like fully owned brands in terms of room rates, which is puzzling. Overall, loyalty programs, brand-driven distribution, and in-house revenue management systems combined give chain properties a competitive advantage that independent hotels often struggle to overcome. All these factors should lead revenue managers to focus on building, acquiring, or collaborating with chains that have brand power. Independent properties also have a fighting chance. Those providing unique cultural offerings, hyper-personalized service, or strong local affiliation can command higher prices. Without low marketing cost though, these hotels usually operate from a structural disadvantage.

Managers may utilize this evidence when formulating focused pricing strategies and narrowing down on points of distribution and tactics that fit their brand promise and offer the highest return. Ultimately, the findings indicate that still having a brand allows

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

hotels within the ASEAN region to hold their prices, and sometimes increase them, even during periods of turbulence in the marketplace.

Hotel location earns a resort markup of approximately 24% above urban hotels. With the spa, sandy beaches, and unbeatable relaxation settings rarely found in urban hotels, the market for leisure travellers has been set. Residual demand hotel strategies allow managers to access set costs, deploy the best forecasting methodologies, and set the costs when the hotel is a resort. Data proves the higher priced leisure compared to the geography is salient, and the attributes are crucial to supporting pricing decisions. For revenue managers, the location remains crucial in setting the hotel room price. Traditionally, resorts unbundle room rates with a set of activities in a way that revenue peaks and valleys are predictable and manageable. Hotels, particularly those on the outskirts of resort districts, must depend on the superior service offered at the lowest price, which is a standard-driven price in the busy city. To summarize the main point, location does matter, but what determines the price of a room in any hotel across the ASEAN region is the peculiar value attached to a hotel's location.

In the case of ASEAN, it is evident that the value that hotel room averages are priced at is not significantly influenced by the value of a hotel sized which contradicts the general assumption that bigger hotels have higher prices. On the contrary, the dominant belief that large hotels can afford lower prices but do not do so is proven wrong if class, brand, and location are considered, and size is not relevant. These results demonstrate the importance of regression analysis, which can efficiently identify what matters, and assists in the avoidance of expensive misconceptions. Rather than that, hotel revenue managers are advised not to bother with the number of available rooms but instead spend their time on the reputation of the brand, the quality of the service offered, and the speed at which the hotel responds to demand when developing price setting strategies. In this regard, it means creating a dominant position in the market by providing high level of customer service to guests, instead of adding inventory.

Both occupancy and revenue influence other key results for hotels in the ASEAN region. For each 1 percent change in occupancy, revenue managers estimate a 1.1 percent change in revenue. All other changes, including seasonality in the revenue line, keep occupancy as the dominant demand driver emerging out of the cloud of noise. Revenue managers do not like to refer to analytically fueled conclusions as assumptions, but rather as reputable results, and equations do not lie. What the models show, and what other properties are showing, is that no matter whether the type of property or the type of market, occupancy is a key driver of pricing. In the end, improving pricing and revenue performance for hotels in this region is reasonable, at least in part, as a function of enhancing the responsiveness of hotels to changes, or in this case, the changes in demand. In other words, the occupancy and pricing changes merged at the right revenue management balance.

In the ASEAN market, analysis correlating revenue and room prices shows RevPAR has a strong association with a hotel's room price. An increase of RevPAR by 1 dollar would mean an increase in the RevPAR room price by 0.2%. Though an increase in 0.2% adjustment per room seems trivial, in terms of large inventories and months, RevPAR becomes a strong driver of revenue growth. Evidence from CBRE indicates RevPAR gains brought increases in average daily rate or room prices, thus supporting the notion that RevPAR should be utilized to guide price setting. In total, the analysis provides a concrete strategy for the revenue teams in the entire region – increase room prices for high RevPAR and maximize profits, regardless of market conditions.

Table I Regression results

	Coefficient	SE	T-ratio	p-value	Remark
Intercept	2.34813	0.186260	12.61	0.0000	
Hotel Class	0.388826	0.0234375	16.59	0.0000	Significant
Hotel Size	0.0103003	0.0362424	0.2842	0.7763	Nonsignificant
Room Occupancy	0.00311491	0.000254099	12.26	0.0000	Significant
Room Revenue	0.00211936	.00006.16434	34.38	0.0000	Significant
Accommodation:(*Chain Mngt served as Reference Category*)					
Franchise	−0.0936197	0.152360	−0.6145	0.5389	Nonsignificant
Independent	−0.0520986	0.0195474	−2.665	0.0077	Significant
Hotel Location: (*Urban served as reference category*)					
Suburban	*−0.0506525*	*0.0553398*	*−0.9153*	*0.3600*	*Nonsignificant*
Small Metro/Town	*−0.0384258*	*0.0657862*	*−0.5841*	*0.5592*	*Nonsignificant*
Interstate	−0.0322497	0.0576961	−0.5590	0.5762	Nonsignificant
Resort	*0.217576*	*0.0536634*	*4.054*	*0.0000*	*Significant*

The proposed framework incorporates some key elements in the theoretical approach to hotel room prices hedonic pricing model. While the original model in hedonic pricing theory viewed price as simply the arithmetic average of features and services such as ambiance, location, and cleanliness, the modified model retains only the traits that survive rigorous statistical scrutiny, enhancing both explanatory power and practical relevance. Coupling the trimmed list of predictors panel regression with Beck-Katz error correction provides stronger estimates by resolving the heteroskedastic and autocorrelated biases that are pervasive in longitudinal datasets. The stronger model based on correction econometric evidence as opposed to abstract logic provides better, well-defined directions to hotel managers attempting to set or decipher room prices.

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

The most significant enhancement to the model is the integration of five key predictors: hotel class, occupancy rate, room revenue, location of the resort, and whether the property is independently operated. Revenue per Available Room (RevPAR) is, of these, the most positively correlated driver, indicating that the more revenue a hotel makes, the higher the room prices it can charge. Classes of the hotel and occupancy rate also increase the prices, as customers apparently are willing to pay more for highly rated properties that are almost always sold out. More recently, Vives and Ostrovskaya (2024) supported these notions, demonstrating that internal service scores, as well as occupancy and classification features, influence hotel market value.

While the model focuses on how a hotel operates internally, it considers external factors as well. For example, a property next to a beach or a hotel located in a resort town significantly boosts its value. Qiao, et.al. (2021) demonstrated the same thing using a specialized map-based regression technique. They concluded that the local topography and its attractiveness largely determine the rates of rooms situated in the countryside and in resort town areas. Furthermore, research indicates that the tendency of independent hotels to charge lower rates than those associated with a prominent hotel chain is a strong phenomenon. This illustrates the power of the brand, which offers the guests a reliable cover and consistent standard of quality and service, which is the same expectation from chain operated premises.

No less important is what the augmented model leaves out. Hotel size, franchise ownership, and type of location (suburban, small metro, interstate) proved to be statistically insignificant in the regression run. These variables, for earlier versions of the hedonic pricing model, were on the list because they were considered reasonable. Removing them now gives the new version a cleaner, more rational appearance. This shift aligns with emerging modelling preferences that emphasize sleek, easily verifiable frameworks over overstuffed models with variables that fail to contribute. Sánchez-Lozano et al. (2021) make the point, adding useless or densely overlapping predictors simply complicates the analysis and makes the results less useful.

Bottom line is, the new framework does not simply adjust the classic hedonic model, it moves the discussion forward by focusing on measurement precision, robust methods, and situational realism. By distinguishing between pertinent and non-pertinent variables, the model simplifies complex statistical analyses and provides managers and researchers with a ready reference. It is fully aligned with hospitality pricing literature, and therefore easily applicable in classrooms, boardroom meetings, as well as in routine pricing and marketing activities in the hotel industry.

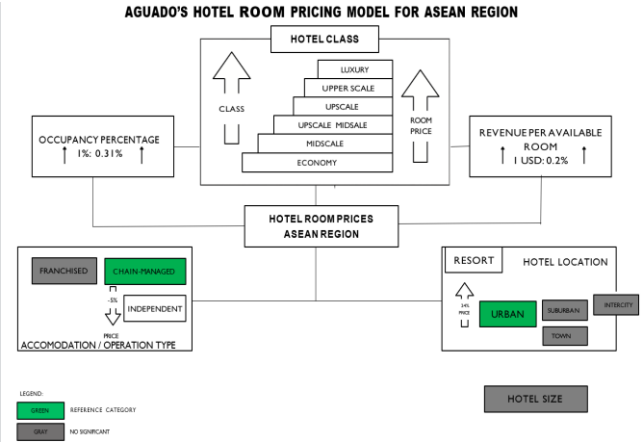

Figure 1. Proposed Model / Framework

III. Conclusion

In the hotels of the ASEAN region, the overall room price is set based on the class of the hotel, the operational model, and most importantly, the location of the property. Once those variables are kept constant, overall size matters more than any of the other factors. Chain-managed hotels, higher rated hotels and seaside or tropical resorts can charge higher prices because of the overwhelming and exclusive brand trust and exceptional experiences offered. Besides, the statement indicates that, to set room prices in ASEAN region, occupancy percentage and RevPAR values are greatly important, and even a slight change in either value can greatly change the prices over a certain period. If these values are monitored closely, then the hotel's management can set the prices, respond to the current situation in the hospitality market, and maximize profits no matter how the conditions are.

Future scholars from within and beyond the university as well as researchers working within the industry are advised to consider additional qualitative variables such as guest satisfaction ratings, digital marketing efforts, and sustainability practices for more in-depth studies, these attributes because certain other attributes related to pricing may come to light.

References

1. Abrate, G., & Viglia, G. (2021). How the hospitality industry reacts to COVID-19: Structural changes and strategic recovery in pricing. Journal of Revenue and Pricing Management.
2. Beck, N., & Katz, J. N. (1995). What To Do (and Not to Do) with Time-Series Cross-Section Data. American Political Science Review, 89(3), 634-647. doi:10.2307/2082979

ISSN 2278-2540 | DOI: 10.51583/IJLTEMAS | Volume XIV, Issue VIII, August 2025

3. Calinao, R. J. G., Amores, M. V., & Amores, E. M. (2022). The determinants of hotel room price in Philippines: A structural equation modeling analysis. Journal of Applied Structural Equation Modeling, 6(1), 19-34.
4. CBRE Hotels Research. (2024). Hotel Brand Performance 2024. CBRE.
5. Chica-Olmo, J., & Zafra-Gómez, J. L. (2022). Hotel pricing strategies and competition: A panel data analysis. Tourism Economics, 28(4), 981-1002.
6. Cottrell, A., & Lucchetti, R. (2023). Gretl User's Guide. Retrieved from http://gretl.sourceforge.net/gretl-help/gretl-guide.html
7. Department of Tourism. (2023). Philippine tourism development plan 2023–2028. Republic of the Philippines.
8. Guillet, B. D., & Law, R. (2021). Revenue management and dynamic pricing: Drivers of performance in Asia-Pacific hotels. Journal of Hospitality and Tourism Management, 47, 118–126.
9. HVS. (2023). Asia Pacific market snapshot: Bali, Jakarta, Bangkok see +30 percentage point occupancy YTD May 2023
10. HVS. (2024). Market Snapshot: Asia Pacific 2024. HVS Research.
11. Jiang, Lan, and Marcia H. Taylor. (2020). "What Hotel Attributes Matter? Understanding the Price Determinants in the Lodging Industry." Journal of Hospitality Financial Management 28(1). doi: 10.7275/3m88-qe37.
12. Morales, C. A., & Villanueva, J. R. (2021). Challenges in integrating revenue management analytics in Philippine hotel education. Philippine Journal of Tourism and Hospitality Studies, 2(1), 23–34.
13. Qiao, H.-H., Wang, C.-H., Chen, M.-H., Liu, J., Su, C.-H. J., & Tsai, C.-H. K. (2021). Hedonic price analysis for high-end rural homestay room rates using geographically weighted regression. Journal of Hospitality and Tourism Management, 48, 354–363.
14. Sánchez-Lozano, G., Pereira, L., & Chávez-Miranda, E. (2021). Big data hedonic pricing: Econometric insights into room rates' determinants by hotel category. Tourism Management, 85, 104308.
15. Soler, I. P., Gemar, G., & Correia, M. B. (2019). Algarve hotel price determinants: A hedonic pricing model. Tourism Economics, 25(8), 1225-1242.
16. Tang, K. D. B., & O'Neill, J. W. (2025). The effects of age on the performance of hotels: Does a historical effect exist? Journal of Hospitality & Tourism Research. Advance online publication.
17. Vives, A., & Ostrovskaya, L. (2024). Exploring the impact of hotel attributes and services on price and revenue: A hedonic pricing model approach with a focus on internal and external segmentation and repeat customers. Journal of Vacation Marketing. Advance online publication.
18. Wickham, H., Çetinkaya-Rundel, M., & Grolemund, G. (2023). R for data science (2nd ed.). O'Reilly.
19. World Travel & Tourism Council. (2023). Travel & Tourism Economic Impact Research (EIR). Retrieved from UNWTO Tourism Importance for Growth Highlighted in World Economic
20. Xu, H., & Li, J. (2022). Operational scale and pricing flexibility in large-scale hotels: A panel data analysis. Tourism Economics, 28(3), 607–624
21. Zhang, Y., Wang, L., & Chen, H. (2021). Hotel size and pricing: How infrastructure and location affect room rates in Asian markets. International Journal of Contemporary Hospitality Management, 33(2), 423–440.
22. Zhou, Y., & Law, R. (2023). Determinants of hotel pricing in ASEAN: The mediating role of occupancy rate. Tourism Management Perspectives, 46, 101