

## Perspectives in Asian Leisure and Tourism

Research articles, essays, practical applications in hospitality, leisure and tourism - with an emphasis on Southeast Asia

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Volume 3

Article 4

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2018

# Exploratory Analysis of 'Other Revenue' Impact on Full and Limited Service Hotel NOI

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### Recommended Citation

Maier, Thomas A. and Roberts, Chris Ph.D. (2018) "Exploratory Analysis of 'Other Revenue' Impact on Full and Limited Service Hotel NOI," *Perspectives in Asian Leisure and Tourism*: Vol. 3 , Article 4.

Available at: <https://scholarworks.umass.edu/palat/vol3/iss1/4>

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## INTRODUCTION

Hotel revenue management practices encompass a number of important revenue generating constructs designed to enhance overall financial performance among full and limited service hotels. They include: forecasting, pricing, and e-commerce distribution strategy to name a few. However, little has been documented in the literature with regard to the "Other Revenue" category and its contribution impact on profitability and NOI profit margin among full and limited service hotels.

The purpose of this paper was to explore the impact 'Other Revenue' had on NOI profit margins in both full and limited service hotels. Other Revenue is a catchall category that is used to record supplementary income such as from parking, cancellation fees, in-room safe rental, etc. Since the objective of hotel operators is to maximize net operating income (NOI) and owner return on investment, further insight and discussion with regard to 'Other Revenue' contribution to profit is warranted. Among the primary activities associated with revenue management practice are continual revenue contribution and profit margin analysis. A thorough understanding of revenue mix of sales and departmental expense ratio impact on NOI profit margin is growing in importance as practitioners strive to yield higher financial returns. Those key hotel operating departments include: room division, food and beverage, and undistributed expenses.

In their comparison study of commercial hotels versus casino hotels, Jang and Yu (2014) cited data compiled by Laventhol & Horwath that 54.4% of revenue came from guest rooms, 31.4% from food & beverage sales, and 14.2% from other minor-operated sources. It is those minor-operated sources that are of focus in this study, which averaged \$750,026 for the 3,271 hotels in the data set (minimum -\$171,831; maximum \$36,734,266). Given the growth in services offered 'on property' that would be classified in this category, it seems timely that a study be conducted regarding the role of other revenue in the scope of revenue management.

## LITERATURE REVIEW

While literature exists surrounding hotel revenue management in general, there lacks significant focus on hotel "Other Revenue Category" and its impact on hotel NOI. In some cases this category contributes significant amounts to total hotel revenue (>\$1m). In these instances, there is fertile ground to evaluate its impact on hotel NOI. Mayerowitz (2014) reported that hoteliers could realize an additional 2% of incremental revenue with a high contribution profit margin associated with various fees and surcharges categorized as "Other Revenue." A review of the literature was conducted to identify to what extent other revenue was included in revenue management and other lodging industry financial studies that had a particular focus upon the role of NOI profit margin and hotel valuation.

Net Operating Income (NOI) is a frequently used measure of performance in the lodging industry (Corgel, 2001/2002; Jang & Yu, 2002; Lee, Corgel, & Shin, 2014; Mandelbaum, 2011; O'Singh & Chekitan, 2014). It plays a key role in the valuation of lodging real estate (O'Neill, 2004; Walsh & Staley, 1993). Egan (1996) contended that NOI divided by the capitalization rate equals value. Thus, NOI plays a key role in establishing the selling price of the property. In spite of the potentially larger sums of income in the other revenue category, it is not usually included in lodging industry financial studies.

Given this key role of NOI, it is a closely watched measure of performance. However, Mandelbaum (2011) wrote that average daily rate (ADR) growth "truly powers profits" (p. 374). Thus, the focus is not completely upon NOI in the assessment of a hotel's financial performance. In addition to playing a key role in hotel valuation, NOI is frequently an operational metric of routine performance. O'Neill, Hanson and Mattila (2008) studied the relationship between marketing expenses, room revenue, and NOI. They separated overall marketing expenses into three categories for the purposes of their study: marketing payroll, franchising fees, and marketing other (comprised of marketing expenses other than the former two categories). They found a strong and positive relationship between marketing other and NOI in all segments except economy hotels. In specific economy hotels, they found a negative relationship, identifying that higher marketing payroll is strongly related to lower NOI. For the relationship between franchising fees and NOI, the upscale and midscale hotel segments had positive relationships, suggesting that investment in the franchise was an important factor in a higher NOI. There was a negative relationship for independent hotels between NOI and franchising or referral fees. The category of other revenue was not included.

While earlier studies reported that payroll costs were typically about 40% for hotels (Corgel, 2001/2002; Walsh & Staley, 1993), Woodworth (2009) noted that expense ratio had increased over time to the 43-45% range. In their study, Pannell, Kerr and Foster (PKF) had forecasted a 7.8% decline in REVPAR for the year 2009; limited service hotels saw a 10-15% reduction in NOI for those properties that experienced this forecasted REVPAR decline. The NOI reductions occurred regardless of occupancy rates prior to the change in revenue (Woodworth, 2009). Since so much of a limited service hotel's expenses are variable, hotel managers were able to reduce or eliminate expenses as revenues fell. Consequently, full service hotels have more cost elements (ratios) to manage

and have a more difficult time in reducing expenses while still meeting full service customer expectations.

Mandelbaum (2011) repeated earlier claims that growth in ADR drives profits and demonstrated that RevPAR and NOI can be measured using a flow-through ratio. He computed the flow-through ratio of 1.85 times for all hotels using the 2010 data collected by PKF HR's Trend® Report (RevPAR had a growth rate of 5.3% and NOI had a growth rate of 9.8%). Singh, Dev and Mandelbaum (2014) echoed that position when they found evidence that ADR is the stronger predictor of RevPAR growth and profitability. Their study produced results that supported the significant, positive relationship between ADR and RevPAR with GOPPAR and NOIPAR. He confirmed that both occupancy and ADR are strong drivers of RevPAR growth, NOI, and profitability.

Xiao, O'Neill and Mattila (2012) examined the influence of corporate strategies upon hotel performance. They hypothesized that revenue and NOI were affected by hotel ownership. They found that the ownership explains 71.54% of the variance in RevPAR and 40.74% of the variance in NOIPAR (Xiao, O'Neill & Matilla, 2012). They further hypothesized that revenue and NOI were associated with the hotel owner's strategies in location, segment, brand affiliation, and the property operator. All four factors were statistically significant in their GLM analysis. Of the four, segment and brand explained the largest portions of the variance in the data for RevPAR, while for NOIPAR, the same variables explained the most variance, but in the reverse order: first brand and then segment. They concluded that hotel owners do implement strategies that directly influence NOI and profitability.

O'Neill and Mattila (2006, 2010) have examined the relationship between hotel brands and property values. They found that some brands had stronger NOIs than others (2006). Additionally, some different brands had stronger ADRs than other brands. In contrast to previous research, O'Neill and Mattila reported that ADR is a better predictor than NOI of a hotel's market valuation (2006). They also reported that for certain segments, brand affects market valuation more than NOI, ADR, occupancy rate, or the number of rooms (2006).

Hanson, Mattila, O'Neill and Kim (2009) narrowed the focus to hotel properties that rebranded or rescaled operations, both of which are key strategic decisions. In a study of 95 hotels that had rebranded or rescaled, the change significantly strengthened the hotel's NOI. They also examined the year-to-year impact of rebranding and confirmed that, while NOI shrank in the first year after the change, there was a strong rebound in NOI in the 2<sup>nd</sup> year and beyond. The study period was a time of attractive economic conditions. It is not clear if rebranding or rescaling during less attractive economic times would have similar results in operational performance and NOI.

O'Neill, Hanson, and Mattila (2008) found significant relationships between marketing expenditures and NOI. In their study they determined a positive relationship exists between marketing, other expenditures and NOI profit margin according to hotel segments such as: luxury, upper upscale, upscale, midscale with F&B, midscale without F&B, and independent hotels. Their key finding indicated, higher marketing other expenditures are consistent with higher NOI. To highlight the value of NOI as a measurement tool, researchers have found as much as 40% of a property's operating expense is payroll (Corgel, 2001/2002; Walsh & Staley, 1993) and that typically was associated with an average occupancy rate of 65% to 70% needed to break even (Walsh & Staley, 1993). Thus, Walsh and Staley concluded that a 15-20% drop in occupancy % would likely eliminate all net operating income (NOI). A shortcoming in the use of NOI can be the failure to acknowledge the seasonal swings in NOI that are common in the lodging industry.

However, Egan (1996) proposed that NOI divided by the capitalization rate would equal the value of the property. By using NOI, the full range of expenses, including any management or franchising fee, would be included in the valuation. Egan examined distressed hotel properties in New Orleans over a ten-year period and identified that stabilized properties had NOIs in the range of 27-40% while distressed properties were considerable lower. Additionally, gross revenues per room were consistently higher in the stabilized properties. He explained the difference as management's ability to physically react to market conditions as well as to manage bottom line profitability. Using net operating income rather than hotel revenue is a very effective approach in computing the debt coverage ratio, a key loan delinquency indicator (Corgel, 2001/2002). Hotels typically have 70% expense ratios and complicated expense schedules. This makes it difficult to translate changes in revenues into changes in NOI. The use of NOI in a debt coverage ratio rather than revenue aids in creating a more accurate predictor ratio. The difficulty in converting changes in revenue to changes in NOI is centered upon the profit margin of the hotel. A flow through ratio can measure the elasticity of NOI in relation to revenues. Hotels offering full service (typically having the range of 70% expense ratios) generally have higher flow-through ratios than limited service properties. The resulting impact is a greater sensitivity to changes in NOI for full service hotels when revenue levels change (Corgel, 2001/2002). While revenue increases will swiftly elevate NOIs, decreases in revenue will just as quickly translate into lower NOIs. The lower NOI will have a strong impact upon the property value, which could exacerbate an effort to sell the property in a downward economic cycle.

Davis and deRoos (2004) agreed that one of the common real estate valuation tactics is the use of NOI. However, they contended that it is only of value if the operating skills used by management to generate that outcome

is transferable with the sale of the property. If the superior NOI generating skill is not transferable, then the perceived value of the property may be decreased in the perspective of buyers in spite of strong current performance metrics. In contrast, if the asset management skills used to generate the strong NOI are transferred with the current owner to a new property, the NOI at the new purchase location is likely to strengthen. A longer holding period allows for the property without the transferable management skills included to still generate a satisfactory NOI and subsequent property value, but such holding periods are unknown in length and subject to market timing (Davis & deRoos, 2004). O'Neill and Belfrage (2005) conducted a study that examined the impact that hotel affiliation had on intangible asset value. They found that the ratio of gross revenue to net of affiliated hotels in situations with significant revenue changes over multiple years resulted in a higher ratio than the NOI ratio. More specifically, they found that the incremental top 20% of total revenue had a flow through rate of 55.7% to NOI. Through a comparison process, they demonstrated that affiliation, as an intangible asset, could have its contribution toward value measured.

In summary, other revenue was not an identified or targeted category in these studies of lodging industry revenue and value. While it was often included in uses of total revenue, its impact upon NOI and hotel valuation was not separated from that of room revenue. Thus, further research is needed to explore the specific role of other revenue in studies of revenue management, NOI and or hotel valuation.

## METHODOLOGY

The dataset used for this study was obtained from Smith Travel Research (STR), a global data and analytics company for the hospitality industry. STR collects hotel data-points on market occupancy, average daily rate (ADR), and revenue per available room (REVPAR) that enables hotel performance comparisons not just between hotel properties, but also between markets and regions. In addition to the market data from 2007-2012, the dataset for this study also included financial statements from both full-limited service hotels in seven different markets across the U.S. The financial statements were also obtained from STR-Host Reports that included income statement and profitability data for the period of 2007-2012. The U.S. based hotel sample consisted of  $n=3,271$  for the years of 2007-2012. The subject hotel properties were purposely selected from both primary and secondary markets based on available data from STR. For purposes of the study, three markets were considered primary based on population greater than 4 million: (1) New York, NY, (2) Los Angeles/Long, Beach, CA, and (3) Houston, TX. These three markets were selected because they are three of the four largest in the USA and are similar in terms of the number of properties and rooms, plus they represent key sectors of the USA (east coast, west coast, and central US). Additionally, four markets were considered secondary based on population greater than 600,000 but less than 4 million: Milwaukee, WI, Oklahoma City, OK, Portland, OR, and Baltimore, MD. Again, these markets were selected because of their typical nature in terms of the number and size of lodging properties in their population category along with their diverse USA geographic representation. Descriptive statistics were used to find the averages for each market-hotel classification group ( $n=3,271$ ; limited service=1,726; full service=1,545) then plotted into upper, average, and lower levels of hotel NOI profit margin performance. All seven lodging markets were robust and the major lodging competitors had a presence in each. Further, there was strong representation of independent, franchised, and corporate properties in each market.

A decision tree analysis was conducted to gain deeper insight into the relationship of various departmental expense ratios (independent variables) to NOI profit margin percentage of the top performing properties (dependent variable) between both full and limited service hotels. Explanatory variables or independent variables selected for Decision Tree analysis were based on a convenience sample related to available STR data. The final dataset had a mix of numeric as well as categorical variables. Numeric variables included: (1) other revenue, (2) total hotel revenue, (3) room occupancy, (4) average rate, (5) REVPAR, (6) room profit margin, (7) food and beverage profit margin, (8) room expense ratio, (9) food and beverage expense ratio, (10) undistributed expense ratio, (11) telecom expense, (12) parking revenue, (13) other expense, and (14) rentals. Categorical explanatory variables included: (1) full service, (2) limited service, (3) primary market and (4) secondary market locations. Although parking revenue was initially categorized in the "Other Revenue" category, because parking revenue in primary markets had broad ranges, a new variable 'Parking portion of Total Revenue' was created to separately capture the magnitude of parking's contribution to NOI.

The Decision Tree modeling was conducted using SPSS statistical software using the CHAID growing method. The classification and regression tree (CRT) method split the data into segments that were as homogeneous as possible with respect to the dependent variable (hotel NOI%). For this analysis, a terminal node in which all cases had the same value for the dependent variable were considered a homogeneous, "pure" node. The Decision Tree model used all the input variables that were obtained from the raw STR data to predict levels of importance or influence on hotel NOI profit margin percentage with an accuracy level of 71.1% (Figure 1). Subsequent tree tables

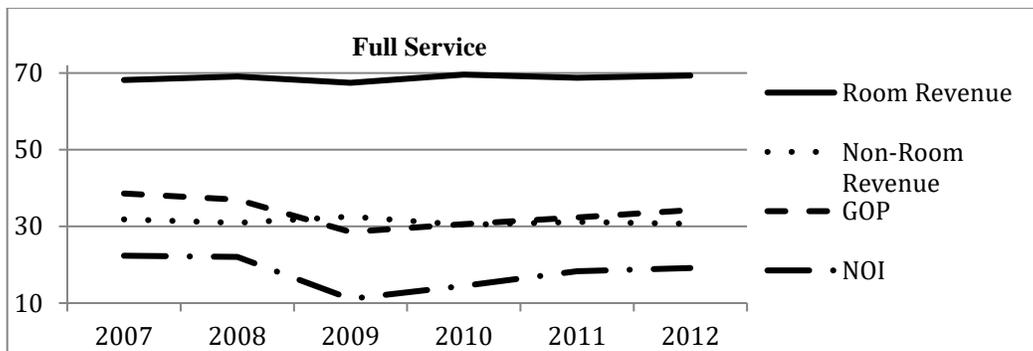
provided the rules for classification and showed how the data were split at each node and identified those variables with the most influence on hotel NOI% for both full and limited service hotels.

### ANALYSIS AND RESULTS

The 3,271 U.S. hotels included in the study were analyzed from STR data using linear regression processing through SPSS statistical software. The regression model was set up to determine significance among the available independent variables impacting hotel NOI profit margin percentage. The independent variables for this full and limited service hotel analysis included: (1) total and departmental revenues, (2) total and department expenses, (3) ‘other’ expense categories, and (4) expense ratios derived from the original STR-Host data.

Reflected in Figure 1 is the multi-year percentage of total revenue trending and key profitability performance metrics associated with full-service hotels studied ( $n=1,545$ ): (1) room revenue, (2) non-room revenue, (3) GOP, and (4) NOI. For the time period, full-service percentage of room revenue remained fairly constant while net operating income (NOI) fluctuated noticeably during the most recent economic downturn in 2009. Full-service hotels needed at least three-years to fully recover NOI to pre-recession levels.

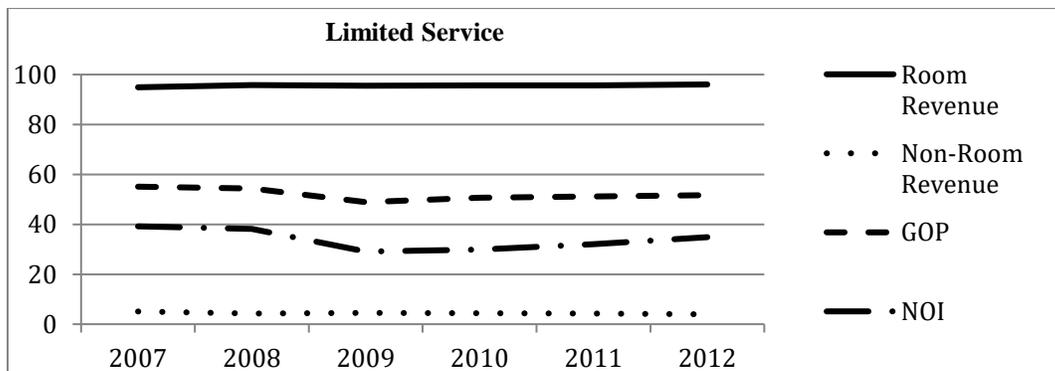
**Figure 1. Full-service hotels, percentage of revenue, 6-year trending data**



Source: Smith Travel Research (STR).

Reflected in Figure 2 is the multi-year revenue percentage of revenue trending and key profitability performance metrics associated with limited-service hotels studied ( $n=1,726$ ): (1) room revenue, (2) non-room revenue, (3) GOP, and (4) NOI. For the time period, limited-service percentage of room revenue remained similarly constant to full-service hotels for the same period while net operating income (NOI) fluctuated less noticeably than full-service hotels during the most recent economic downturn in 2009. Limited-service hotels NOI recovered from the 2009 economic downturn steadily, still needing three years to recover to pre-recession levels.

**Figure 2. Limited-service hotels, percentage of revenue, 6-year trending**



Source: Smith Travel Research (STR).

For the full service hotels that were studied ( $n=1,545$ ), the mean hotel NOI was 18%, and the upper 3<sup>rd</sup> or “above average hotel NOI” was above 29%. For limited service properties, the mean hotel NOI profit margin was

33% and the upper 3<sup>rd</sup> or "above average" grouping of hotels in the study exhibited NOI profit margins of above 40%. These hotel NOI profit margin levels (29% for full service hotels [ $n=254$ ] and 40% for limited service hotels [ $n=318$ ]) became the baseline for the top performing hotels in the decision tree analysis.

### Linear regression

With the role of 'Other Revenue' as the central research question of this study in mind, a linear regression analysis was conducted to identify which independent variables could be used as a predictor of the NOI profit margin percentage. All of the revenue and expense variables were used in the stepwise analysis. In order of impact on NOI profit margin for hotels in general, the most important factors were 'room expense ratio', 'undistributed expense ratio' and 'portion of other in total revenue'. The adjusted r-squared was .522, suggesting that the model does explain about half of the impact upon NOI. The model was significant at the .000 level (see Table 1 for full regression details). The power of the model in terms of the research question of this study is questionable, though. It is not especially surprising that the first two independent variables were primary in the model given that the contribution margin of room revenue is typically robust and the undistributed expenses are generalized to the entire operation. It is logical to think that an increase in either expense amount would have an immediate negative impact upon NOI. The negative influence of the third variable (other income as a portion of total revenue) may reflect the costs associated with providing these other services. The variable of F&B Expense Ratio was not included in the model as its contribution to the R square was .003. The regression equation is:

$$\text{NOI Profit Margin} = 1.070 - 1.428(\text{Room Expense Ratio}) - 1.494(\text{Undistributed Expense Ratio}) - 1.634(\text{Portion of Other in Total Revenue})$$

**Table 1. Regression Analysis-NOI Profit Margin (Independent Variable)**

Regression Model	Unstandardized Coefficients		Standardized Coefficients	Adjusted R Square	t	Sig.
	B	Std. Error	Beta			
Constant	1.070	.015			72.831	.000
Room Expense Ratio	-1.428	.047	-.408	.352	-32.708	.000
Undistributed Expense Ratio	-1.507	.048	-.409	.504	-31.084	.000
Portion of Other in Total Revenue	-1.634	.148	-.137	.522	-11.041	.000

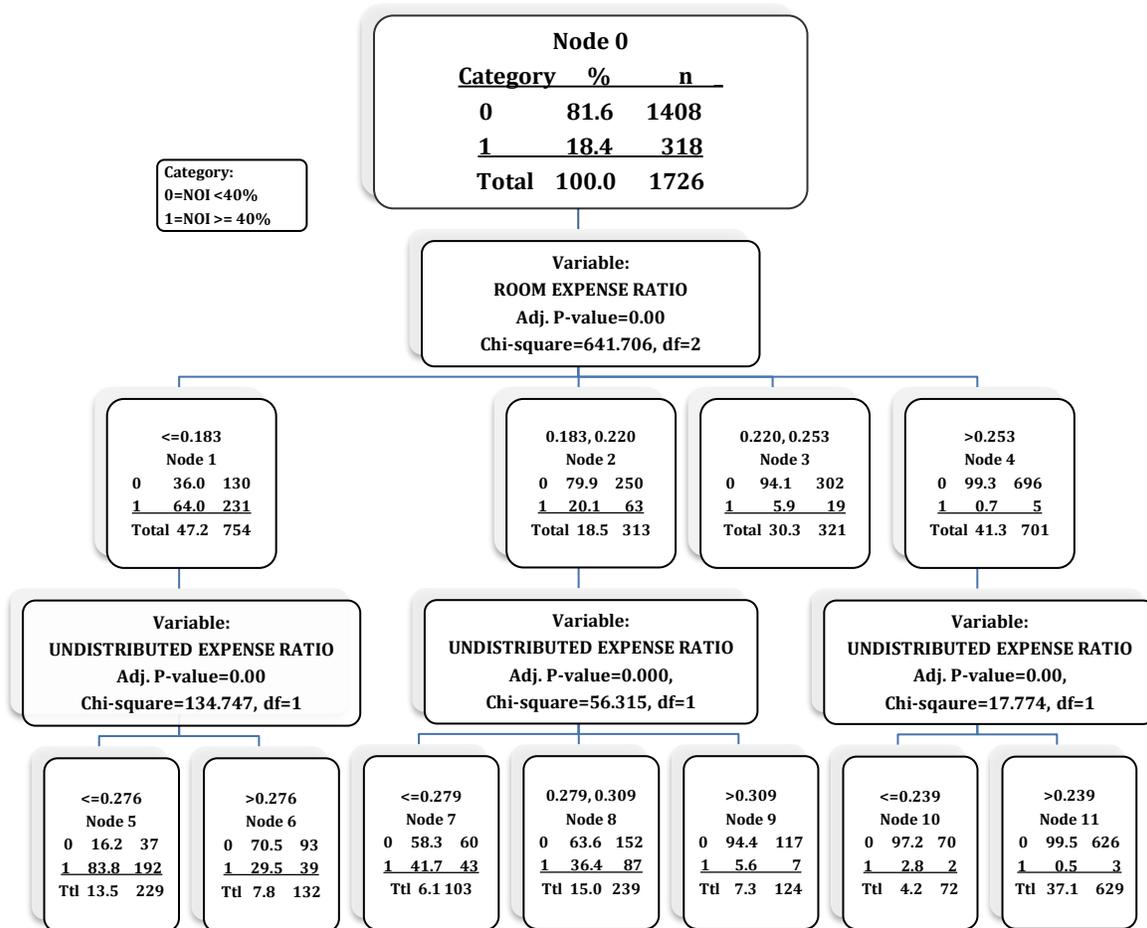
The role of 'Other Revenue' did not have an important impact in the model as it only contributed an inconsequential 0.018 to the R squared value. Overall, this would suggest that 'Other Revenue' does not play a significant role in the revenue management process in terms of its impact upon NOI. Having observed this, however, it would be useful to understand at what ratio levels the variables, perhaps specifically the 'undistributed' category, play a role in NOI performance. As a result, a decision tree was built using NOI profit margin as the target.

### Decision Tree Analysis

The decision tree analysis provided a granular view of the expense ratio levels associated with and influencing the highest-performing hotel NOI profit margin among the subject hotels. Interestingly enough, 'Other Revenue' was insignificant in both the full and limited service models. An Automated Linear Regression analysis was conducted to identify predictor importance of the independent variables. The predictor levels of performance of those variables with the greatest ratio level of impact on hotel NOI among all hotels sampled were: (1) undistributed expense ratio, (2) room expense ratio, and modestly (3) food and beverage expense ratio (see Table 3). Note that 'Portion of Other in Total Revenue' (the 3<sup>rd</sup> variable in the regression statement) was listed 4<sup>th</sup> in this ranking of predictor importance, just behind the modest value of F&B expense ratio.

There were 318 limited-service properties included in this data set (NOI was above 40%). Two tiers of nodes were produced in the decision tree analysis (see Table 2). Room expense ratio was the top-node, meaning it influenced the likelihood of the hotel NOI profit margin performance more than any other variable node ( $P=.000$ ; Chi square 641.706;  $df=2$ ). After room revenue expense ratio, the undistributed expense ratio was the next most impactful and the only other significant variable that influenced hotel NOI ( $P=.000$ ; Chi square 56.315;  $df=2$ ). This suggests, unsurprisingly, that hotel operators should focus on generating revenues and minimizing costs at the same time. This decision tree outcome is in alignment with the regression model.

**Table 2. Decision Tree Output for Limited-Service Hotels**

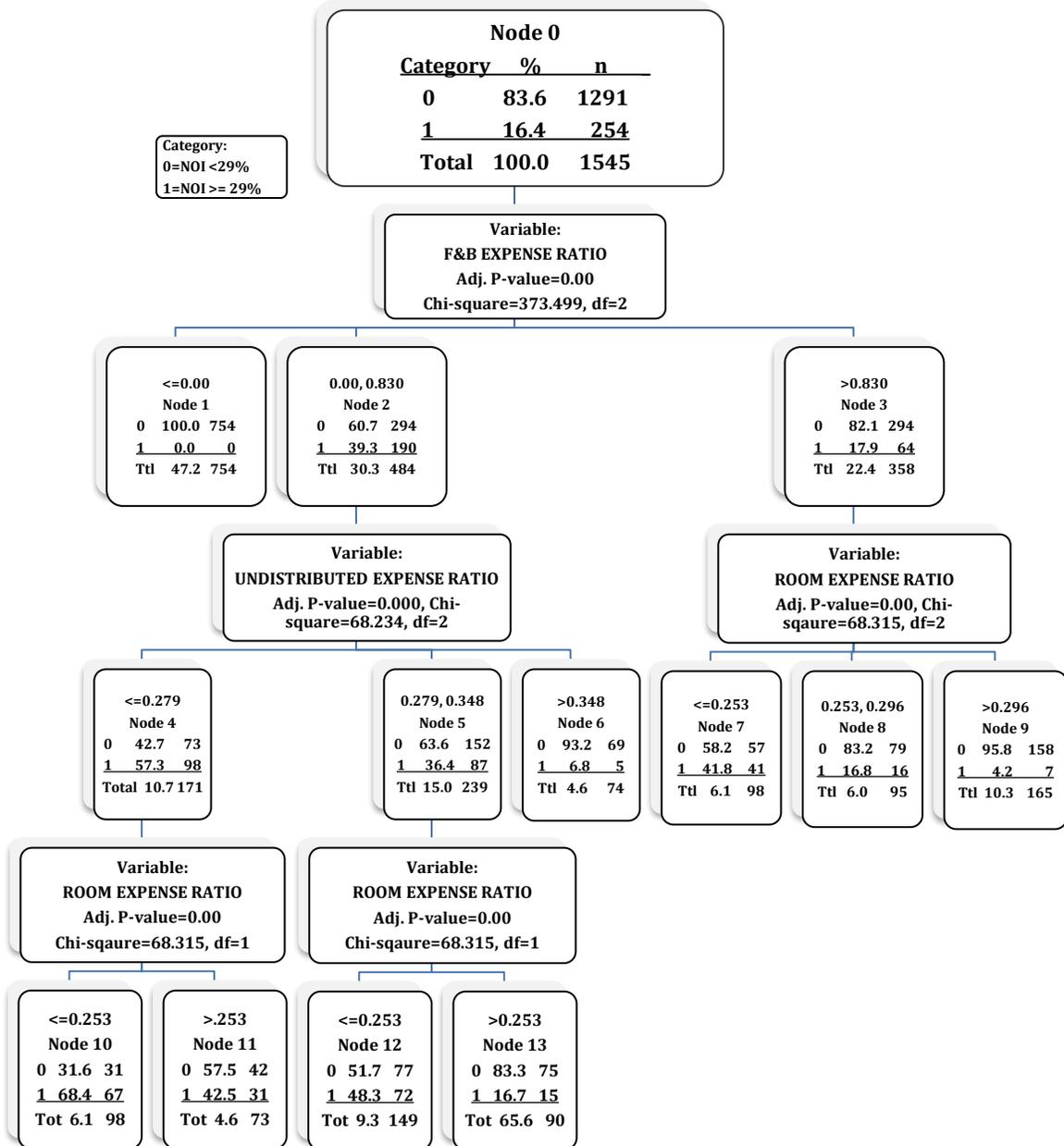


The 192 hotels in node 5 (lower left corner) represent the very best performing hotels. Those 192 properties had a room expense ratio of less than 18.2%, and an undistributed expense ratio of less than 27.6%. Similar to the full service hotels, a focus upon managing these two expense ratios (undistributed and room expense) are important factors in generating a top performance NOI for their peer group.

There were 254 top performing full-service hotels in this data set (NOI ≥ 0.29). The decision tree results (Table 3) included three tiers of variables. Of those tiers, F&B expense ratio was the variable that accounted for the biggest hotel NOI influence (1<sup>st</sup> tier of nodes: P=.000; Chi square 373.499; df=2) followed by undistributed expense ratio (2<sup>nd</sup> tier of nodes: P=.000; Chi square 68.234; df=2). Lastly was room expense ratio (3<sup>rd</sup> tier nodes: P=.000; Chi square 68.315; df=1).

F&B expense ratio of tier 1 acted as a screening variable for these full service hotels. The mean of this variable was .8302 with a standard deviation of .2328 (minimum = .2404; maximum = 3.076). Of the 254 top performing hotels, 64 had F&B expense ratios greater than 83% (node 3). The other 190 hotels had an F&B expense ratio less than .83, or less than the mean (node 2). Thus, node 2 represents the better performing hotels that had an F&B contribution margin of 17% or greater (1.00-0.83=0.17). Of those 64 hotels with greater than 83% F&B expense ratios (node 3), 41 still had room expense ratios under 25.3%, which represents the best performance of that variable in this data set (node 7). This demonstrates that hotels can achieve top performance in NOI by focus upon the management of room expenses even when their F&B expenses are above average. It does suggest, however, that NOI could be improved a bit more for these properties if their F&B expense ratio was improved.

**Table 3. Decision Tree Output for Full-Service Hotels**



The best performing hotels in this data set are represented in node 11 (lower left corner). These 67 hotels have the lowest room expense ratio (less than 25.36%), an undistributed expense ratio less than 27.95%, and an F&B expense ratio under 83%. Acknowledging that everything can be improved, these 67 hotels demonstrate that focusing upon the management of these three expense ratios can lead to top NOI performance in their peer group of full service properties.

**DISCUSSION AND CONCLUSIONS**

Set forth for this study was the goal to investigate the impact 'Other Revenue' had on hotel NOI. Measurement criteria and or literature surrounding hotel 'Other Revenue' category and its impact on NOI profit

margin performance are limited. As owners strive to gain greater returns and higher valuations from their properties, measuring the impact of all revenue and expense contribution categories is recommended.

This study indicated room and undistributed expense ratios have a greater impact on NOI than ‘Other Revenue’ in limited service hotels. Food and beverage, undistributed, and room expense ratios had a greater impact on NOI profit margin than ‘Other Revenue’ category in full-service hotels. These findings shed a confirming light on the importance of departmental expense ratio performance. This would suggest hotel operators are better served focusing on departmental expense ratio performance and revenue generation as the top drivers of NOI performance. Although researchers have found occupancy, ADR and REVPAR can explain major variations in NOI, other factors as identified in this study are notable. In their research, O’Neill and Matilla, (2006) found age of hotel, brand affiliation and type of hotel and location are additional important factors that can influence NOI. They specifically found that hotels with higher occupancy might create greater operating efficiencies rather than always driving higher rates and room revenue to impact hotel NOI.

The benefits of this study indicated hotels should focus on the following objectives: (1) carefully examine the departmental expense ratio differential between limited service or full service hotels prior to finalized valuation calculations and the impact food and beverage expense has on full service hotels in particular, (2) concentrate on both top-line revenue generating activities while simultaneously improving departmental operating expense ratios (3) explore the opportunities available to drive additional “Other Revenue” especially given the nature of parking revenues and their high contribution profit margin to NOI among urban market hotel locations, and (4) since undistributed expense ratios in both full and limited service hotels have a significant impact on NOI profit margin, dedicated resources and human capital talent should be directed to looking at continuous improvement strategies geared towards strengthening departmental operating efficiencies.

Like any other research effort, this study is not free from limitations and challenges. With regard to the first part of the investigation, the ‘Other Revenue’ line item has a very high gross profit contribution margin. Given this, future research into ways to broaden ‘Other Revenue’ revenue generating opportunities will likely benefit owner returns in a favorable manner. With regard to the Decision Tree analysis, more insights into expense-level relationships may benefit from segmenting the available data set more finely. For instance, do secondary markets and primary markets operate similarly? Does parking have a higher contribution to NOI profit margin given the location and market size? Certainly other opportunities similar to these questions could be explored in the quest to maximize NOI profit margin.

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