Evaluating the Impact of a New Resort Amenity on Gaming Business Volumes

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Acknowledgement: This study was supported by a grant from the Harrah Research Endowment

Abstract

Using performance data from an Atlantic City hotel-casino, theoretical models are advanced to estimate the effects of a new indoor pool/nightclub on both daily coin-in and table game drop. This study represents the first attempt to estimate the indirect gaming contributions of a new nongaming amenity. The pool/nightclub variable was found to significantly increase table game drop at a rate of $150,500 per day, but it failed to produce a significant effect in the coin-in model. The core model, design, and results described herein are critical to operators and developers alike, as estimating the impacts of new nongaming amenities on key gaming volumes has been a guessing game to date. Thus, this paper offers a way to substantially improve return-on-investment calculations for new nongaming amenities. Although constructed with gaming in mind, the core model could be easily adapted to a variety of leisure service businesses.

Introduction

Pool/club amenities are becoming increasingly popular, providing a significant source of revenue for hotel-casino resorts (Kaplan, 2010). Describing Hard Rock's Rehab, a popular Las Vegas pool/club, Kaplan stated that "with admission fees in the $40 range, cabanas coming with food-and-drink minimums that run to thousands of dollars per afternoon, and bottles of Grey Goose vodka going for $400 apiece, there's clear motivation to increase the allure of pool clubs: direct profit". Kaplan (2010) also cited the opinion of Hard Rock's CEO, Joseph Magliardi, who believes that guests who visit the pool/club may also utilize other property facilities, including gambling outlets.

Variations on the pool/club amenity include adult pools that charge admission and feature celebrity hosts to attract customers, copying a practice that is well established in Las Vegas nightclubs (Yancey, 2010). Pool/clubs can also double as venues for big name entertainment, such as the case with Mandalay Bay Resort and Casino's Mandalay Bay Beach. The trend to develop pool/clubs is expanding in Las Vegas and elsewhere. For example, Tropicana Las Vegas recently announced the development of the Nikki Beach Club, which will feature a beach club-nightclub combination in partnership with lifestyle entertainment developer Nikki Beach (Gaming Industry Wire, 2010), and Wynn Resorts opened its Encore Beach Club - Surrender Nightclub complex in May, 2010.

Although the pool/club concept is well established in Las Vegas, it is less prevalent in other casino markets. In addition, while there is a belief that pool/clubs also generate gaming revenue (Kaplan, 2010), this assumption has not been empirically tested. Las Vegas benefits from a climate that allows outdoor pool/clubs to operate for much of the year. The development investigated in the current research was an indoor pool-nightclub complex that opened in an Atlantic City casino resort in 2007. Utilizing gaming data from before and after the venue opened, it was possible to estimate its indirect impact

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on gaming activity. This represents a critical step in the process of understanding the full return on investment associated with a pool/club amenity.

As Kale (2006) notes, there are often great differences in the profits produced by nongaming amenities and the casino itself. Kale also alludes to the idea that many nongaming attractions produce insufficient direct profits to support the amount of capital invested in them. Therefore, management must be able to demonstrate that the nongaming amenities have produced significant contributions to gaming business volumes (a.k.a. indirect contributions) to justify the investment in such attractions.

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In the current economy, developers and operators cannot afford capital investment mistakes, as profits are diminished and capital is in scare supply. Before adding a new amenity, management must estimate both the direct and indirect profits associated with the project. Although estimating direct profits is certainly no easy task, the estimation of indirect profits is even more difficult. This study advances and tests a theoretical model designed to estimate the indirect gaming contributions associated with the introduction of a new indoor pool/club amenity. Although the aim of this study may sound specific to gaming, the core model and process could be easily extended to other forms of leisure services. That is, the model advanced in this paper is chiefly comprised of predictor variables that represent different forms of the availability of customer leisure time. In essence, these core variables are certainly not unique to casino resorts.

Literature Review

This section begins with a brief review of claims made by industry executives regarding the indirect gaming contributions produced by nongaming amenities, including pool clubs. The possible rationale behind these claims and the integrity of the indirect cash flow estimates is also discussed. This is followed by a three-part review of empirical research related to the estimation of indirect gaming contributions produced by both nongaming and gaming amenities. Finally, a theoretical model is advanced along with the null hypotheses to be tested in this study.

Industry Claims

It is not difficult to find support for the idea that nongaming amenities supply substantial amounts of indirect revenues to the casino. For example, in its 2003 Annual Report, Caesars Entertainment reported a $30-million decline in casino revenues for its Western Region, from the prior year level. Of the properties run by Caesars Entertainment, Caesars Palace was the only one in the Western Region to post an increase in casino revenue, which management stated was "driven by additional guest traffic due to the 4,100-seat Coliseum and new food and beverage venues" (Caesars Entertainment, 2004, p. 51). The assumption of indirect gaming contributions from pool/club amenities is no exception. For example, Kaplan (2010) includes commentary from Hard Rock's CEO, Joseph Magliardi, who touts the potential crossover spend of pool/club guests in other areas of the resort, including gaming outlets.

Although common to the trade literature, claims of indirect contributions to gaming volumes are often made without describing the analytical methodology behind the claim. Worse yet, the magnitude of the alleged contribution to gaming volumes is either undisclosed or based on heroic assumptions. However, the magnitude of the indirect gaming contributions can be a critical component of the return-on-investment (ROI) calculations used to justify and/or gauge the success of these costly nongaming amenities.

Once a costly amenity is built, gaming executives are often inclined to claim success, as it was their decision to spend the money required to develop the project.

The likelihood of such claims is increased for pet projects and/or those that have been internally championed. An admission of failure could be perceived as a career-damaging proposition.

While the direct profits of some Las Vegas pool/clubs have been touted in the trade literature, there is little if any discussion of the development costs. That is, for pool/clubs to be wise investments, the amenity needs to produce cash flows commensurate with the investment and the company's minimum ROI standards. In any case, for management to accurately evaluate the ROI of a nongaming amenity such as a pool/club, all cash flows, direct and indirect, must be included in the analysis. It is possible that the success of pool/clubs has been understated, due to undetected or underestimated indirect contributions to profitable gaming outlets. Next, empirical research aimed at estimating the indirect effects produced by nongaming amenities is reviewed.

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Entertainment Amenities

Although there are no published empirical studies on the impact of adding a new amenity, there is a growing body of literature on the indirect impact of existing amenities on gaming (Legg & Hancer, 2010). Entertainment is one form of amenity that has been investigated. Showroom headcounts were found to increase daily slot coin-in and table game cash drop levels, using secondary data from two Las Vegas resorts (Suh & Lucas, 2010). A significant relationship between headline entertainment and gaming was obtained using secondary data from a Las Vegas Strip casino, for which blackjack cash drop increased significantly on days when a popular entertainer was performing (Lucas, 2004). Showroom attendance was also shown to increase food revenue in a Las Vegas resort (Suh & West, 2010), and dining volume, in turn, has been found to be positively related to gaming volumes (Lucas & Santos, 2003; Roehl, 1996; Tanford & Lucas, 2010). However, no empirical research has identified this hypothesized structure. That is, it is not known whether entertainment patronage leads to restaurant patronage, which, in turn, leads to casino patronage.

Self-report measures have found similar positive effects for casino entertainment. Specifically, in research among Las Vegas locals, attendance at large or small scale shows but not lounge acts was related to higher self-reported gaming spend (Roehl, 1996). A survey of Las Vegas slot players found ratings of a gaming property's entertainment offering to be a significant predictor of willingness to recommend the casino to others, but not of repatronage intentions (Yi & Busser, 2008). Dandurand and Ralenkotter (1985) found that entertainment-prone visitors to Las Vegas reported trip gaming budgets that were significantly greater than visitors who did not attend shows ($1,002 vs. $811). The entertainment-prone designation was assigned to all respondents who claimed to have attended at least one show during their trip to Las Vegas. Of the 2,000 individuals surveyed, 70% of them were identified as entertainment-prone.

Dining Amenities

Analyzing secondary data from a Las Vegas local casino and two riverboat casinos, researchers found a one-unit increase in restaurant headcount resulted in an increase in coin-in ranging from $202 to $382 (Lucas & Santos, 2003). In a recent study, casual dining was found to be significantly related to low-end slot coin-in and cash table game drop for casinos in both local and destination markets (Tanford & Lucas, 2010). The impact on slot coin-in was especially profound in the local market, where each additional casual restaurant cover was associated with an $875 gain in slot coin-in, on 25-cent and lower denomination machines. However, another study failed to obtain a significant relationship between restaurant covers and coin-in, using data from an off-Strip Las Vegas casino (Lucas & Brewer, 2001).

Studies analyzing self-reported data primarily support the relationship between casino restaurant patronage and casino spending and visitation. In a study of Las Vegas local casino visitors, casino coffee shop or gourmet restaurant patronage was related to greater self-reported gaming expenditures, whereas buffet patronage was not (Roehl, 1996). Other researchers have found dining in casino restaurants to be related to the likelihood to return to the casino and recommend it to others (Richard & Adrian, 1996; Yi & Busser, 2008), but neither study examined the impact of casino restaurant patronage on gaming activity per se.

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Gaming Amenities

Although bingo is not a nongaming amenity, it is included here because it requires a significant amount of space, yet is often not profitable in a direct sense. Therefore, it could certainly be considered as a gaming amenity for some operators. Understanding its indirect impact on gaming will help management determine whether to add or continue operating a bingo room, or whether another amenity might be a more profitable use of the bingo room space. In short, the operation of a bingo room often depends on the estimation of its indirect profit contributions to other profitable gaming activities, which is a task similar to that of the current study.

Using secondary data from an off-Strip Las Vegas casino, bingo headcounts were significantly related to slot coin-in, and were estimated to produce an additional $432 in slot handle, or $17.75 in slot win, per bingo headcount (Lucas & Brewer, 2001). However, in a second study, bingo headcount variables failed to produce significant and positive effects on the daily coin-in of both an off-Strip Las Vegas casino and a California tribal casino (Lucas, Dunn & Kharitonova, 2006). These results are particularly troubling when considering the popularity of the belief that bingo rooms make significant contributions to slot profits. Finally, in a study relying on self-reported data, a combined measure of the importance of bingo and bowling amenities was not significantly related to repatronage intentions (Yi & Busser, 2008). All data were collected from a convenience sample of slot players who patronized an off-Strip Las Vegas casino.

Conceptual Model and Hypotheses

Several of the studies designed to estimate the indirect effects of hotel-casino resort amenities have utilized a modeling approach that is applicable to the process of estimating the impact of a new amenity on gaming business volumes (Lucas, 2004; Lucas & Brewer, 2001; Lucas et al., 2006; Lucas & Santos, 2003; Suh & Lucas, 2010; Suh & West, 2010; Tanford & Lucas, 2010). These researchers utilized secondary time series data from casino properties, and applied simultaneous multiple regression analysis (SMRA) to analyze the impact of the key variable (i.e., an amenity), along with control variables that have been shown to predict casino gaming volumes. Gaming volumes tend to be higher on weekends, holidays, and during special event periods. In addition, casino data are often nonstationary, indicating that the data exhibit a linear trend over time. This condition may be due to seasonality, economic cycles, sampling frames, and/or other factors. Finally, observations that measure the same variable at different points in time are often correlated with each other, which can result in the serial correlation of the model error terms. ARMA (autoregressive and moving-average) terms have been successfully employed to address the serial correlation of the errors and improve the prediction power of the models.

In the current research, the same time series methodology was applied to the addition of a new venue at a casino resort. In this case, the venue was an indoor pool complex that could be transformed into a nightclub. Figure 1 presents a conceptual model that depicts proposed influences on slot and table game business volumes, including the impact of the new pool/nightclub amenity. With the exception of the pool/club variable, the specification of this model is clearly derived from the literature reviewed herein.

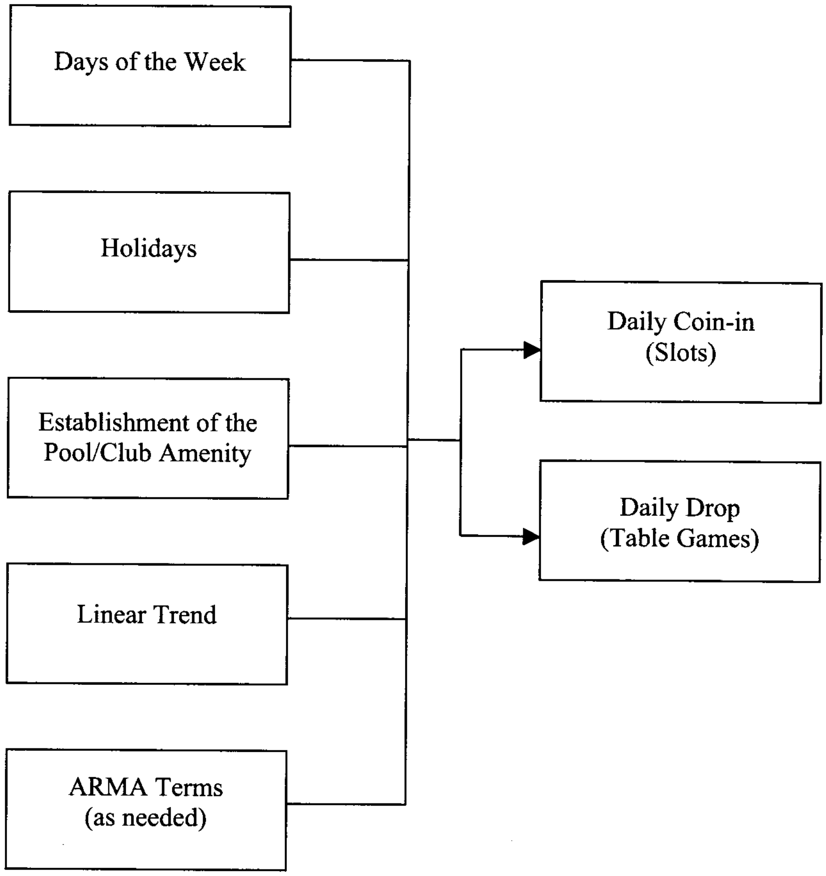

Figure 1. Theoretical model designed to predict daily coin-in and table game drop.

In the absence of definitive extant research results, directional hypotheses were not advanced with respect to the effect of the new pool venue on slot and table game volume. The null hypotheses from both models are listed next.

$H_0 1$: $B_{Pool} = 0$

In $H_0 1$, B_{Pool} represents the regression coefficient for the pool variable in the model designed to predict daily coin-in.

$H_0 2$: $B_{Pool} = 0$

In $H_0 2$, B_{Pool} represents the regression coefficient for the pool variable in the model designed to predict daily table game drop.

Methodology

The data were obtained from the records and systems of an Atlantic City hotel-casino. As the donor of this data wished to remain anonymous, certain information related to the source must remain confidential. This hotel-casino has over 1,500 hotel rooms and produced in excess of $500M in annual gross gaming revenues, in both 2006 and 2007. The 495 daily observations were gathered over a period beginning on May 24, 2006, and ending on September 30, 2007. This date range provided an opportunity to measure the year-over-year impact of the pool amenity. That is, by beginning the sample on May 24, 2006, coin-in and drop data produced in the absence of the pool could be analyzed in concert with coin-in and drop levels produced after the pool opened on May 24, 2007. This design provided an opportunity to examine the additive effect of the pool, during the peak summer pool season. Without the year-over-year feature of this design, it would not have been possible to isolate the unique effect of the pool from the seasonal effect of summer.

All hypotheses were tested via multiple linear regression analysis, at the 0.05 alpha level. Simultaneous entry of the predictor variables was employed, such that each regression coefficient represented the unique effect of each independent variable on the dependent variable, after the effects of all other predictor variables had been considered. Auto-regressive (AR) and moving average (MA) terms were incorporated to include the explanatory power of the error process. These ARMA terms also produced models with independent residuals. Such an approach is recommended when modeling time series data (Pindyck & Rubinfeld, 1998). The data were analyzed using EViews, v. 3.1, and SPSS, v. 17.0.

Expression of Dependent Variables

Coin-in represented the total daily dollar-amount of wagers produced by all slot players. Alternatively stated, *coin-in* is the aggregate daily dollar-value of all slot wagers. *Drop* represented the daily dollar-value of all cash purchases of gaming cheques and chips produced by players, across all table games, plus the daily dollar-value of all markers issued, less the daily dollar-value of all markers redeemed. In this case, *markers issued* represents the daily dollar-value of all gaming cheques/chips issued to table game players via credit. *Markers redeemed* represents the daily dollar-value of all payments on outstanding markers issued to table game players (i.e., payments on or against markers issued). For more on drop formulae, see Kilby, Fox, and Lucas (2004).

Expression of Independent Variables

As is common to time series modeling, there were three different types of predictor variables employed. That is, there were key, control, and correction variables. The key variable in the models advanced in this paper was expressed in a binary format. That is, the days on which the pool was open were assigned a value of 1.0. Alternatively stated, on each day, from May 24, 2007 through September 30, 2007, the pool variable was set to 1.0, while each day prior to May 24, 2007 the pool variable was set to a value of 0.

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The control variables represented any variable theorized to influence the dependent variable, aside from the key variable. In this case, any other variable thought to influence the daily gaming volumes (i.e., coin-in and table game drop) would be considered a control variable. The days of the week (e.g., Saturday), holidays, and special event days have been found to be effective control variables in models designed to explain gaming volumes (Lucas & Brewer, 2001). In the current study, binary variables were used to represent the individual days of the week and the following holiday periods: New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, and Thanksgiving. These variables were set to a value of 1.0 on the day of the holiday itself as well as the surrounding days, when appropriate. That is, certain holidays were deemed to affect the gaming volumes of the days before and/or after the actual holiday date. The effects of other holidays aside from the ones listed here were examined; however, these variables failed to produce statistically significant effects at the 0.05 alpha level, and, thus, were not included in the final models. A trend variable was employed to create a de-trended or stationary series. This variable represented the long-term trend component of each gaming volume series. Trend was set to zero on the first day of the sample period. Its value increased by one on each subsequent day, reaching a maximum value of 494 on the 495th day.

Finally, the correction variables were represented by the ARMA terms. The "AR" stands for auto-regressive and the "MA" is an abbreviation of moving average. In econometric modeling these ARMA terms are often referred to as correction variables, as they are employed to remove serial correlation in the error process. Moreover, they often provide considerable prediction power to the models, as they also represent an unidentified or unnamed explanatory structure within the error process.

Results

Data Screening

The time series plots shown in Figures 2 and 3 were examined to determine the basic structure of the response variable series. These plots are central to the time series modeling process, as they are used to visually determine the stationarity of the response variable values over time. That is, Figure 2 depicts a series that exhibits a reasonably constant mean and variance over the course of the sample. This series would be considered stationary, making it unnecessary to transform the response variable. In short, the same conclusions held for the table game drop series depicted in Figure 3.

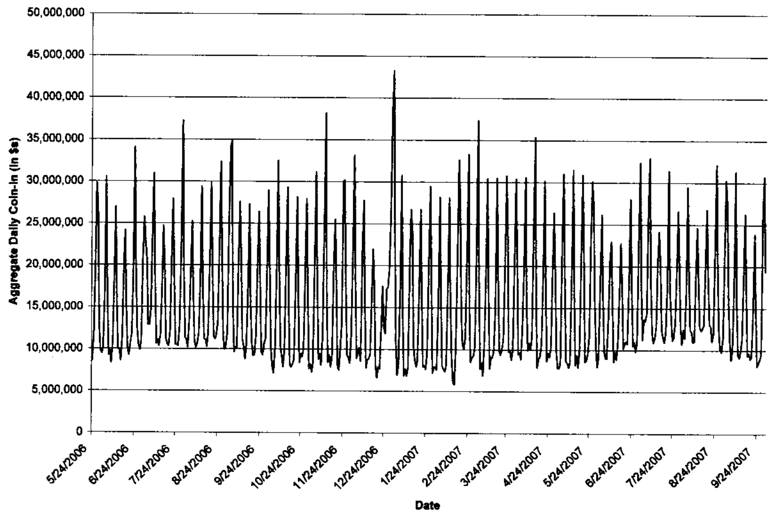

Figure 2. Graph of aggregate coin-in dollars by day from May 24, 2006 to September 30, 2007.

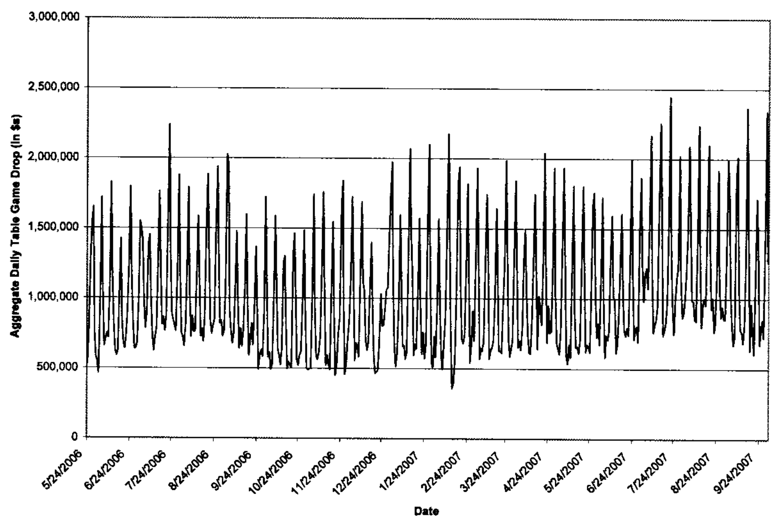

Figure 3. Graph of aggregate table game drop dollars by day from May 24, 2006 to September 30, 2007.

Although two separate models were tested, the descriptive statistics shown in Table 1 describe the dependent variables from both models. These two variables were the only continuous variables appearing in the final models, as the trend variable failed to produce a statistically significant effect in either model.

Table 1: *Descriptive Statistics: Continuous Variables (n=495)*

	Min.	Max.	Mean	Std. Dev.
Coin-in	$5,808,922.00	$43,267,165.00	$15,577,140.56	$7,577,042.88
Table Game Drop	$358,679.00	$2,442,777.00	$1,022,896.30	$435,144.38

Given the absence of continuous predictor variables, a table of product-moment correlation coefficients was not necessary. However, Table 2 lists the frequency of each binary variable. Again, only the variables appearing in the final models are shown in Tables 1 and 2.

Table 2: *Frequency Table for Binary Variables (n=495)*

Variable Name	# of Days Set to 1.0
Pool	130
Thursday	71*
Friday	71
Saturday	71
Sunday	71
New Year's Day	4
Presidents' Day	2
Memorial Day	4
Independence Day	5
Labor Day	6
Thanksgiving	3

* *Thursday* did not appear in the final table game drop model.

From Table 2, the frequency of the pool variable is important to note. *Pool* was set to a value of 1.0 on 130 of the 495 days in the sample period (i.e., 26.26% of the days). The following holidays occurred twice within the sample period: Memorial Day, Independence Day, and Labor Day. This explains the higher frequencies associated with these holiday periods.

Formal Data Analysis

Table 3 lists the results of both models. The coin-in model produced an R^2 of 90.6%, with an F-statistic of 352.62 (df = 13, 481; $p < .0001$). The table game drop model produced an R^2 of 88.1%, with an F-statistic of 269.17 (df = 13, 481; $p < .0001$).

Table 3: *Results of Models Designed to Predict Daily Coin-in & Daily Table Game Drop (n=495) (Coefficients in $'s)*

Variables	VIFs	Coin-in Equation ($R^2 = 0.906$) Coefficients		Table Game Drop Equation ($R^2 = 0.881$) Coefficients	
Constant		9,554,052		678,811	
Pool	**1.02 / 1.02**	**452,766**		**150,550**	*
Thursday	1.15 / n/a	1,216,672	*	n/a	
Friday	1.16 / 1.08	10,145,055	*	501,379	*
Saturday	1.16 / 1.08	19,249,408	*	1,072,327	*
Sunday	1.16 / 1.09	8,370,892	*	452,790	*
New Year's Day	1.01 / 1.01	12,502,434	*	336,538	*
Presidents' Day	1.01 / 1.01	5,809,067	*	569,417	*
Memorial Day	1.01 / 1.01	7,053,244	*	502,495	*
Independence Day	1.02 / 1.01	3,463,039	*	292,862	*
Labor Day	1.01 / 1.01	7,010,163	*	255,736	*
Thanksgiving	1.01 / 1.01	3,859,147	*	253,923	*
AR(1)		0.31	*	0.43	*
AR(3)		n/a		0.10	*
AR(6)		0.16	*	n/a	
AR(7)		n/a		0.13	*

Notes: * indicates statistical significance at the 0.05 alpha level (two-tailed test). The "n/a" designation indicates variables and/or results that were either not applicable or absent from a particular model. For each predictor variable, the first variance inflation factor (VIF) applies to the coin-in model, while the second VIF applies to the table game drop model.

The results associated with the key variable, *Pool*, appear in boldfaced type within Table 3. *Pool* failed to produce a statistically significant effect in the coin-in model (B = $452,766; p = 0.31). However, the pool variable did produce a positive and significant effect in the table game drop model (B = $150,550; p < 0.01). That is, the days on which the pool was open produced $150,550 more table game drop than the days on which the pool was not open.

Model Diagnostics

The assumption of independence was examined by reviewing graphs of each model's error process. These graphs were correlograms, which included Q-statistics and associated p-values for 36 lags. Once the appropriate ARMA terms were added, there were no instances of problematic serial correlation among the residuals in either model. Scatterplots of predicted values and studentized deleted residuals showed no signs of heteroskedasticity in the models. Scatterplots of model residuals failed to indicate violations of the linearity assumption. As there were no continuous predictor variables, the model errors were not plotted against the independent variable values. Histograms of the residuals showed no signs of problematic departures from normality.

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Variance inflation factors (VIFs) were reviewed to assess the degree of multicollinearity present in the models. The magnitude of the VIF associated with the key variable in both models was the primary concern. The VIF for the pool variable in both the coin-in and table game drop models was 1.02, indicating a very low degree of correlation with the other predictor variables. In fact, no variable in the table game drop model produced a VIF in excess of 1.10, while no variable in the coin-in model produced a VIF in excess of 1.17. Overall, these results failed to indicate the presence of problematic multicollinearity in either model. Given the number of categorical predictor variables, such an absence of multicollinearity is quite remarkable, indicating that the models were very well specified.

Outliers were present in the graphs of the studentized residuals. Given a sample size of 495 observations, this was expected. However, the magnitude of the sample size also served to diminish the effect of the outlier observations on the regression coefficients. That is, no single observation was able to substantially affect the estimate of each variable's effect on the dependent variable (i.e., the regression coefficients). DF Beta statistics were examined to verify this general notion of the diminished effect attributable to the outlier observations. Further, each outlier was examined to determine the validity of the observation. This examination resulted in the elimination of no dates, as all of the outliers appeared to be valid observations. As is common with gaming data sets, the outliers were produced by the holiday periods. This often occurs in spite of the use of indicator variables for these dates.

Discussion

The null hypothesis associated with the pool variable was rejected in the table game drop model, supporting the notion of a positive effect produced by the pool/club amenity. That is, these results suggest that the presence of the amenity appears to have significantly increased table game business volumes beyond the level recognized in the absence of the pool/club. This finding certainly supports management's decision to add the amenity, notwithstanding any hurdle rates associated with capital investment policy or the returns associated with competing capital investment projects.

The amenity has not significantly increased slot business volume beyond the level recognized in the absence of the pool/club.

The coin-in model is another story. Based on the results, the null hypothesis associated with the pool variable could not be rejected. That is, the estimate of the pool/club's affect on daily coin-in was not significantly different from zero. Such a result suggests that the presence of the amenity has not significantly increased slot business volume beyond the level recognized in the absence of the pool. This result is a bit troubling, as 85% of the donor property's 2007 annual gaming win came from slots.

Managerial Implications

The results associated with the pool variable provide key start positions for further analysis. That is, the construction cost of the amenity is relatively easy to compute. The revenues and expenses associated with operating the pool/club are also fairly straightforward. However, the indirect gaming revenues associated with the amenity are not so easy to estimate. This is due to the many simultaneous forces capable of impacting daily gaming volumes. For example, the other predictor variables shown in Table 3 were also all found to significantly affect gaming volumes.

By isolating the effect of the pool variable, while considering the effects of the other predictor variables, management is afforded a rigorous and objectively derived estimate of the pool's unique impact on gaming activity. However, coin-in and drop are not revenues. Both dependent variables represent gaming business volumes, as opposed to revenue or win. To remedy this condition, the regression coefficients for the pool variables must be multiplied by the average house advantage in slots and the average hold percentage in table games. Table 4 provides an example of how the estimated impact of the pool variable on table game drop would be converted to a table game revenue equivalent.

Table 4: *Estimated Indirect Contribution to Table Game Win Associated with the Pool Amenity*

Gaming Activity	Regression Coefficient	Historical Hold %*	Estimated Indirect Win From Pool
Drop (Table Games)	$150,550	15.9%	$23,937

Note. * Based on annual results produced in 2006 and 2007.

With respect to Table 4, the *Estimated Indirect Win from Pool* ($23,937) is the product of *Regression Coefficient* ($150,550) and *Historical Hold %* (15.9%). Of course, the variable costs associated with the production of table game win would further reduce the estimated indirect win associated with the pool amenity. Based on input from the management of the donor property, it is reasonable to expect that 25% of the $23,937 in incremental table game win would be retained as operating profit. That is, the property's earnings before interest, taxes, depreciation, and amortization (i.e., EBITDA) would be increased by $5,984 ($23,937 x 25%) from incremental table game operating profits associated with the pool/club. It is important to note here that this estimate represents daily EBITDA contributions. That is, for each day that the pool was open, it is estimated that the amenity contributed $5,984 in indirect EBITDA contributions by way of the table game department. The pool/club was open for 130 days during the time frame examined in this study, resulting in a total indirect EBITDA contribution of $777,920 ($5,984 x 130).

The same type of analysis could be conducted using the pool coefficient from the coin-in model. However, in this study, that estimate was not statistically different from zero. Therefore, management must be aware of the considerable range of values associated with the use of such an estimate. Further, this range includes zero, which represents a possible value of the pool coefficient. Of course, a value of zero would indicate that the pool complex had no effect on daily coin-in levels. While such a result may appear disappointing, it is tremendously valuable to the company. Capital investments often fail to reach the cash flow projections produced in the project pro forma. Knowledge of difficult-to-measure yet critical cash flow streams can be most helpful when executives from other properties wish to add a pool complex, in the name of indirect contributions to slot business volume.

In review, all of this analysis is made possible by first estimating the effects of the pool/club amenity on the key gaming volume indicators (i.e., coin-in and table game drop). For many non-gaming amenities, these estimated contributions to coin-in and drop represent the most elusive and critical piece of the ROI puzzle. Incremental gaming revenues are easily estimated from this point. Once the variable operating costs are subtracted from the indirect gaming revenue contributions, the remaining cash flows can be attributed to the return on investment associated with the construction/development of the pool/club amenity. Such business intelligence is of tremendous value to both operators and developers alike, as the construction cost of non-gaming amenities is often substantial. Further, estimates such as the ones provided herein allow operators and developers to make better decisions related to the optimal use of scarce capital budget funds. That is, management is able to better estimate and rank the potential returns associated with competing capital projects.

Limitations & Future Research

This study examined data from a single property. Consequently, these results are not generalizable. Additionally, multiple regression analysis does not prove cause and effect. Although the type of analysis contained in this study is often referred to as causal modeling, the results can only be judged to the extent that they support or fail to support the tenability of the models advanced herein. While both models posted great R^2 values, the possibility of other equally effective or better solutions remains. The results may also embody a novelty effect. For example, the daily contributions to table game profits may wane as the novelty of the pool/club fades.

The models, research design, and expression of the pool/club amenity afforded management a viable means of isolating and quantifying the effects of the pool/club on gaming business volumes. Such partial derivatives could be computed for other amenities as well, provided their associated business volumes could be appropriately expressed. For example, a similar model could be built for a new restaurant or a new entertainment venue. That is, once the venue has been open for a sufficient number of days, its effects on critical gaming/business volumes could be estimated using the same form of model along with the incorporation of the year-over-year sampling period. The year-over-year sampling period may be critical, given the marked seasonality of business volumes in the hotel-casino industry.

Any replication of this study would be helpful in understanding the effects of a pool/club amenity on gaming volumes. Further, the data set examined in this and other studies could be used to create double-log models. Such models would express the effects of the pool/club on the gaming volumes in the form of a percentage change. Common in the field of economics, double-log models can aid the process of building theory, as all results are expressed in a common metric – the percentage change in the dependent variable produced by a one-percent change in the key variable. This accommodation allows for broader comparisons across otherwise quite different data sets with respect to the scale/magnitude of the business volumes.

Although not addressed in this study, the addition of a pool/club could help management increase the hotel's occupancy rates and/or the average daily room rate. Such effects could make valuable cash flow contributions to the overall resort. A similar model and quasi-experimental design could be employed to examine the effects of the pool/club on these critical hotel business volumes.

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Article submitted: 8/30/10
Sent to peer review: 8/30/10
Reviewer comments sent to author: 9/21/10
Author's revised comments received: 10/1/10
Article accepted for publication: 10/4/10