1-1-2006

Estimating the impact of entertainment on the gaming volume of Las Vegas hotel casinos

Eunju Suh
University of Nevada, Las Vegas

ESTIMATING THE IMPACT OF ENTERTAINMENT ON THE GAMING VOLUME OF LAS VEGAS HOTEL CASINOS

by

Eunju Suh

Bachelor of Science
Ewha Women's University
1999

Master of Hotel Administration
University of Nevada, Las Vegas
2002

A dissertation submitted in partial fulfillment
of the requirements for the

Doctor of Philosophy Degree in Hotel Administration
William F. Harrah College of Hotel Administration

Graduate College
University of Nevada, Las Vegas
May 2006

INFORMATION TO USERS

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleed-through, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

ProQuest Information and Learning Company
300 North Zeeb Road
P.O. Box 1346
Ann Arbor, MI 48106-1346

UNLV

Dissertation Approval

The Graduate College
University of Nevada, Las Vegas

This Dissertation prepared by **Eunju Suh**

Entitled

Estimating the Impact of Entertainment on Gaming Volume of Las Vegas Hotel Casinos

was approved in partial fulfillment of the requirements for the degree of

Doctor of Philosophy in Hotel Administration

By the undersigned on April 11, 2006

Anthony F. Lucas, Examination Committee Chair

Bo Bernhard, Examination Committee Member

Kathy Nelson, Examination Committee Member

Ashock Singh, Graduate Faculty Representative

Dean of the Graduate College

ABSTRACT

Estimating the Impact of Entertainment on the Gaming Volume of Las Vegas Hotel Casinos

by

Eunju Suh

Dr. Anthony F. Lucas, Examination Committee Chair
Associate Professor of Hotel Administration
University of Nevada, Las Vegas

This study addressed the indirect effect of entertainment on gaming volume (i.e., coin-in). Specifically, this study attempted (1) to gain an understanding of the relationship between show patronage and gaming volume; and (2) to estimate the magnitude of incremental revenue for each show attendee. Conceptual models to examine the indirect effect of daily show headcounts on gaming volume were proposed, including other variables previously found or theorized to influence gaming volume. Secondary data (i.e., show headcounts, daily coin-in and daily cash drop) were collected from two different Las Vegas Strip properties. This study employed multiple regression models with the appropriate autoregressive (AR) and moving average (MA) errors, to adjust or correct for autocorrelation present in time series data. .Hypotheses associated with the show headcount variables were tested at a .10 alpha level, given the exploratory nature of this research.

In regression models associated with the first subject property, the show headcount variable had a significant effect on both coin-in and cash drop. This finding supports

conventional wisdom that shows drive gaming volume. Despite the positive linear correlation between show headcounts and gaming volumes, the economic significance of the incremental win per show attendee was not substantial. For the second subject property, the impact of show headcounts on coin-in was not statistically significant, whereas show headcounts had a significant influence on cash drop. In general, the results of this study suggest that show goers are not necessarily avid gamblers.

The findings of this study point to the importance of careful selection, investment and management of entertainment options. If the purpose of a show is to complement casino gaming, it should produce a strong spillover effect on gaming volume. If not, the show should be profitable on its own. It also better position itself as a necessary component of a full-service resort. With the findings of the current work, casino operators could further evaluate whether show attendees produce sufficient returns on investment. Additionally, this study adds valuable empirical results to the limited literature base associated with the impact of entertainment on gaming volume. Finally, it provides a platform for future research in this area.

TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGEMENT

I wish to express my sincere gratitude to my family for their unconditional love, support and sacrifice: Hyunan Suh, Sujung Lim, Inwhan Suh, and Eunjung Suh. I also want to express my deepest respect and appreciation to my committee chair, Anthony F. Lucas, Ph.D., for his excellent guidance, support and encouragement during the dissertation process and the years of my Ph.D. study. I would also like to thank my examination committee, Drs. Bo Bernhard, Kathy Nelson and Ashok Singh for their helpful suggestions with regard to this dissertation. A special thanks also goes to John Arfuso who contributed many helpful suggestions and comments.

CHAPTER 1

INTRODUCTION

"We're looking at a whole range (of customers) -- fans of Celine [Dion] who wouldn't otherwise have come to Las Vegas, people who normally come to Caesars [Caesar's Palace Hotel and Casino] but haven't otherwise taken a trip to see Celine, guests at other properties interested in staying at our properties," -- Robert Stewart, Park Place spokesman (CasinoMan, 2003, para. 7).

The above-referenced quotation is a comment regarding Park Place Entertainment Corporation's $95 million investment in a new showroom for Celine Dion's live show at Caesar's Palace Hotel Casino in Las Vegas. The company predicted that this production show featuring the popular singer would generate roughly one million attendees annually in the 4,100-seat showroom (Tiscali Music, 2003). Although the company does not share ticket sales from Celine Dion's show, these attendees were expected to spend at least an extra $30 to $50 during their trip on casino gaming, food and shopping at the property, which would lead to a 20% return on additional business from the show patrons (CasinoMan, 2003; Tiscali Music, 2003). With regard to the Park Place's "risky gambling" on the show, Steve Wynn, the owner and builder of several major hotel casinos in Las Vegas, mentioned that the show could contribute to additional revenues for the casino (Tiscali Music, 2003). However, he did not offer estimates of this contribution.

Shows have been a part of competitive strategy for many hotel casinos in Las Vegas to lure people to the casino floor (Alsop, 1983; CasinoMan, 2003; Dandurand & Ralenkotter, 1985; "Gaming Industry," 1994; Las Vegas Online Entertainment Guide [LVOEG], 2004). Las Vegas has built its reputation as a place for entertainment, as well as gambling (LVOEG, 2004). Hotel casinos in Las Vegas currently offer a wide variety of shows and lounge acts performed by singers, comedians and dancers. However, many shows in Las Vegas and Atlantic City have usually been loss leaders (Atlas, 1995; CasinoMan, 2003; Guier, 1999; Yoshihashi, 1993b). In general, loss leaders refer to products promoted under temporary price discounts at very low margins or even below retailer costs (Walters & MacKenzie, 1988; Walters & Rinne, 1986). Retailers use loss leaders to generate additional store traffic and sales of other items. In fact, casinos often do not share ticket sales for headliner or production shows, despite their considerable investment in a custom-built theater or a showroom. A negative bottom line for entertainment is not as big a concern for casino management as is overall casino profitability, primarily because shows are believed to be effective in drawing people to the casino floor, thereby contributing to casino revenues.

A show could function as a primary draw attracting thousands of people who might never have been attracted to the casino. However, the crowds may not gamble or even spend money on other non-gaming activities at the property. Despite a substantial investment in showrooms, there is a lack of empirical evidence to support the show-related loss leader strategy or a positive relationship between show patronage and casino performance. As casinos competitively offer various options of entertainment, research

is needed that can provide management with strategic insights into the relationship between entertainment and gaming volume.

Theoretical Framework

A review of anecdotal literature revealed abundant conjecture and theory, which support conventional wisdom that show headcounts drive gaming volume. The findings of some gaming literature also indicated that show attendance was correlated with the length of stay and casino spending (Dandurand & Ralenkotter, 1985; Roehl, 1996). In particular, Lucas and Santos (2003) advanced a model to examine the indirect effect of casino-operated restaurants on gaming volume and revealed a positive relationship between food covers and gaming volume. They provided a platform for the current research. This study is in line with the work by Lucas and Santos, as both studies examined loss leader-related strategies that have been prevalent in the casino industry. Hence, the findings of this current work will extend those of Lucas and Santos. Outside of gaming literature, studies in the areas of marketing and promotion contributed to the development of this study's models. This dissertation will produce empirical evidence describing the relationship between show patronage and gaming volume. The results of this study would be most useful for show promotion and capital budgeting decisions. Additionally, the method employed in this study could help casino managers estimate the indirect effect of entertainment on gaming volume.

Problem Statement

This study raised questions about the impact of entertainment-related promotion strategy that has been common in the casino industry: Does a show lure customers who play casino games, thereby producing additional gaming revenue? If so, how much? This study attempted to test conventional wisdom that entertainment brings in customers who produce additional gaming revenue. The specific objectives of this study were (1) to gain an understanding of the relationship between show headcounts and gaming volume; and (2) to quantify the indirect effect of entertainment on gaming volume by estimating the magnitude of the incremental revenue for each show patron in attendance.

Justification

As entertainment becomes important as a strategic marketing tool in competitive casino markets, concerns about the direct and indirect revenue generation of a showroom are increasing among casino operations (Dandurand & Ralenkotter, 1985; Kaplan, 1981). In order to determine the success of entertainment choices, management needs to consider the indirect effects of entertainment on gaming revenue, as well as the direct contribution to the company's bottom line via ticket sales. However, the indirect contribution is less obvious when compared to the direct contribution shown on a profit and loss statement.

Despite the competitive entertainment offerings by casinos, there have not been any significant attempts to evaluate the indirect effect of entertainment on gaming volume. Relatively few empirical studies examined whether entertainment-prone visitors have a desirable gaming profile. Previous studies relied mostly on self-reported accounts of

consumer behavior, gathered from surveys. No empirical studies or research exist that employed secondary data to estimate the indirect effects of entertainment offerings on gaming volume. Casino executives' subjective judgment and conventional wisdom that shows drive gaming volume seem to be the primary source, or at least the most consistent justification for investment in a showroom-type entertainment venue. Although casino managers seem to agree on the existence of direct and indirect effects of entertainment on gaming volume, no congruency has been reached regarding the magnitude of the indirect effect (Dandurand & Ralenkotter, 1985).

Additionally, the percentage of Las Vegas visitors, who have seen a Las Vegas style production show or a big-name headliner show during their trip, has continued to decline over the past five years (Las Vegas Convention and Visitor Authority [LVCVA], 2003). The average allotment for shows and comparable entertainment has also decreased significantly over the years, $45.54 in 2001, $44.79 in 2002 and $37.82 in 2003. Among those who attended no shows, the main reasons for not attending were "no interest in shows" (30%), "too busy/not enough time" (36%), "seen everything already (11%), and "too expensive" (8%). A previous study relating to casino choice modeling also suggested that proximity to a player's house and readily available parking were the most important factors affecting Las Vegas local residents' decision process in casino patronage (Shoemaker & Zemke, 2005). Entertainment was not a major factor in casino selection.

Given the lack of empirical evidence and congruency with regard to the impact of entertainment on gaming volume, information related to the relationship between show patronage and gaming volume is of considerable value to the industry. If show

attendance affects casino business volume, it is critical to produce empirical evidence to support conventional wisdom and learn more about the magnitude of entertainment's indirect effect on gaming volume. In particular, it is important to measure whether the magnitude of monetary gains, at a minimum, is sufficient enough to compensate for the operating costs of the showroom. If a positive relationship between show patronage and gaming volume is not found, it will indicate a clear need for further investigation to explain the impact of shows on the casino business volume. Once the indirect effects of entertainment on the casino are better estimated, it will help casino executives develop strategies for managing and developing shows more effectively.

This study is also important for the following reasons. Casinos have unique measurement challenges related to the estimations of the indirect effects of various ancillary services and amenities. Unless charges are billed to the guest room account, individual players' expenses on non-gaming activities are hard to track. Tracking gaming activities is also challenging for many casinos. Although a player's gaming activities can be recorded, low rates of card use is a concern for many casinos. This is because many players fail to utilize their player tracking cards while gaming. For instance, casinos on the Las Vegas Strip have been known to experience as low as 30% to 35% carded play out of total play (Kilby, Fox, & Lucas, 2004). It is very likely that some guests will play casino games without using their tracking card.

For the above-mentioned reasons, it is difficult to accurately determine the individual show attendees' spending on gaming or non-gaming activities. However, to appropriately evaluate the overall contribution of entertainment to the bottom line, casino management should estimate the total consumption of entertainment-driven customers.

Hence, a study is necessary to estimate indirect contributions of such amenities, compensating for the inability of casinos to track all players' performance at the transaction level. This study was designed to examine the indirect effect of entertainment on gaming volumes. In other words, this study investigated whether customers enticed by entertainment are profitable to the casino operators. If a substantial amount of casino gaming occurs among entertainment-driven customers, casino management may want to allocate more money and resources for promoting entertainment. If no substantial indirect effects exist, casino executives may want to shop for or develop entertainment options that are directly profitable. With information on the estimated gaming cash flows from show attendees, casino management could rank the value of an entertainment-driven customer segment in comparison to other customer segments.

Finally, casino executives should know how to evaluate the drawing power of entertainment in order to estimate the risk and return related to entertainment. The findings of this study will help casino executives better understand the indirect contributions of entertainment to gaming revenues. Casino executives could also better estimate the potential cash flows from shows. Shows may increase property headcounts or foot traffic. This, in turn, may also increase gaming volumes. However, it may not increase profits. In other words, just because a show draws people into the casino, there is no guarantee that an economically significant increase in casino profits will result. This is valuable information for use in pro forma modeling used in the capital budgeting decision process. Finally, it would help casino executives make the best use of casino floor space and capital investment dollars.

Research Propositions

P1: Show headcounts will produce a positive effect on daily coin-in.

P2: Show headcounts will produce a positive effect on daily cash drop.

Definitions

1. Show headcounts represent the number of show attendees taken daily from the show's ticketing system. In this study, complimentary show headcounts were excluded from total show headcounts. From this point forward, the term show attendees refers to non-comped or cash-paying attendees.
2. Day of the week indicates Monday, Tuesday, Thursday, Friday, Saturday, and Sunday. Tuesday, Wednesday, or both days served as the base period in models.
3. Holidays examined in this study include Presidents' Day, St. Patrick's Day, Memorial Day, Mother's day, Independence Day, Labor Day, Easter, Columbus Day, Super Bowl Sunday, and Thanksgiving.
4. Special events indicate fights and concerts at one of the subject properties.
5. Coin-in represents the total amount of money wagered per day in all mechanical games, including reel, video poker, video keno, and multi game slot machines.
6. Cash drop is the daily business volume of table games, excluding credit (marker) play. For table games, drop refers to the total amount of cash and chips in each game's drop box, along with any credit issued at the game (Kilby et al., 2004). A drop box is a locked box attached to the table into which cash, chips and all transaction-related documentation conducted at the table are placed (dropped). With respect to credit (marker) play, players can wager with a credit instrument (marker), which is used by

the casino to document the extension of credit to a player. Drop can only be gathered by day, as the drop boxes are counted only once a day.

7. Production shows are regularly scheduled Las Vegas style shows offered by hotel casinos in Las Vegas. These shows usually are performed in custom-built showrooms with varied seating capacities and include specialty acts. The specialty-act characteristic and the origin of the show separate production shows from Broadway-style shows.
8. Broadway-style shows refer to live entertainment productions that were performed in Broadway theatres and gained notoriety on Broadway.

Delimitations

The Las Vegas Convention and Visitors Authority (LVCVA) categorized entertainment into five types: (1) big-name headliner performers in Las Vegas for a special concert (i.e., Barbra Streisand); (2) regularly scheduled Las Vegas style shows (i.e., the "Blue Man Group" show and the Cirque du Soleil performance of "O"); (3) comedy shows or revues (i.e., Improv); (4) lounge acts or other kinds of free entertainment provided at a location other than the "main" showroom; and (5) other (LVCVA, 2003). One of the commercial websites featuring Las Vegas shows (Travel nice: http://las-vegas.travelnice.com) listed additional categories of shows, such as dinner shows, magician shows, tribute shows, comedy shows and adult shows.

This study analyzed regularly scheduled shows in Las Vegas. Two different shows, a production show and a Broadway-style show, offered by Las Vegas Strip properties were examined. Despite the different styles, both shows share similarities. Both properties are

located on the Las Vegas Strip and their showrooms have seating capacity for over 1,100 people. Additionally, the shows at the subject properties perform once or twice a night, but dark days (days of no shows) vary over the year. Both properties provide the physical space for the show performance, resources for box office operations, ushers, and staff for maintaining and cleaning the showroom. They also support various activities for promoting and advertising their shows. Given the similarities between the two shows, both shows were considered in the same vein for this study's analysis.

The subject properties requested anonymity. Hence, the terms LV Hotel 1 and LV Hotel 2 were used throughout this paper in reference to them. Under the current show contract, LV Hotel 2 shares half the revenue from ticket sales and pays half the show expenses. This contract type is often referred to as a *two-wall contract*, in which the casino assumes some risk. *Two-wall contracts* attempt to split expenses and revenue or risk and return. Information regarding the LV Hotel 1's show contract was not available for this study. With respect to the show prices, the average ticket prices of the LV Hotel 1's show and the LV Hotel 2's show were $89.90 and $124.50, respectively.

Secondary data (i.e., show headcounts, daily coin-in and daily cash drop) were collected from the two casinos. In this study, credits (markers) issued by the casino were excluded from drop, and only the daily aggregate cash drop was used as the indicator of table games' business volume. Researchers (Lucas, 2004; Lucas & Santos, 2003; Kilby et al., 2004) have cited analytical limitations of the drop metric as a measure of table games' business volume. In particular, drop could be disproportionately affected by credit players. Lucas and Santos (2003) noted that the disproportionate contributions of drop are problematic in correlation-based analysis. Players who gamble on credit are

usually high rollers. Hence, the inclusion of credit play could generate a disproportionate or excessive increase in drop when compared to the corresponding increase in show headcount. Given the analytical problems associated with the credit play, only cash drop, which does not include credits issued, served as the dependent variable for table games' business volume in this study. In comparison to drop, only the money wagered in gaming machines can increase the slot machine business volume (i.e., coin-in).

Additionally, complimentary show headcounts were excluded from total show headcounts. The show headcount data included only non-comped, cash paying attendees. This is mainly because this study attempted to measure the pure drawing power of a show by isolating the gaming contribution from the middle-level gaming clientele (e.g., a 25¢ slot player). Typically, the middle-level players are not provided with extraordinary incentives to patronize the property. However, they produce substantial profits for the casino (Lucas, Kilby, & Santos, 2002). Contrary to the middle-level players, high-end players receive financial incentives and complimentary offers for hotel rooms, food and shows. However, escalating play incentives driven by competition damage the profitability of the high-end gaming segment (Lucas et al., 2002; Kilby et al., 2003). In fact, table-game losses to the high rollers are likely to be offset by slot win from the middle-level gaming clientele (Lucas et al., 2002). With respect to revenue from the low-end gaming clientele, particularly table game players, it is insufficient to cover operating costs, mainly due to high labor costs and small profit margins (Kilby et al., 2003). Additionally, the inclusion of complimentary show headcounts could be problematic in correlation-based analysis, as comped show headcounts are likely to be related to credit

play. The analytical limitations associated with credit play were discussed in the previous paragraph. For these reasons, regular-paying show attendees were separated from attendees with complimentary offers.

CHAPTER 2

LITERATURE REVIEW

Introduction

This chapter provides a review of literature relevant to entertainment offerings in casino environments and other industries. The chapter is organized as follows. First, it discusses the role of various entertainment types. Second, the chapter examines studies associated with the relationship between entertainment and consumer behavior. In the third section, loss leader strategies are discussed. The fourth section reviews real estate literature that addressed the spillover effects between retail stores in a shopping center. The fifth section describes different types of show contracts. Further, related industry trends are discussed. Finally, the proposed models are illustrated along with the research propositions tested in this study.

The Role of Entertainment

Full-Service Theory

To have a competitive advantage, casinos across the country are now offering more than gaming. Gaming alone may no longer be enough to lure customers, given the spreading availability of casino games and the increasing competition in casino markets. Hotel casinos in Las Vegas provide visitors and locals with a complete resort experience by offering various services and amenities, including but not limited to, shows, clubs,

bars, restaurants, spas, fine-art galleries, retail stores and meeting facilities. For instance, the operating philosophy of the MGM Grand Hotel Casino on the Las Vegas Strip is to provide its guests with an upscale, full resort experience, including lodging, dining, entertainment and convention facilities, rather than the conventional gaming experience (Yahoo! Inc., 2005b). Moreover, casinos in other jurisdictions throughout the country are attempting to turn themselves into full-service destination resorts. San Diego's tribal casinos are diversifying into non-gaming areas by investing millions of dollars in hotels, restaurants, golf courses, spas, and conference centers (Cruz, 2004). For instance, Pala Casino transformed itself into a full-service destination resort featuring a hotel, several restaurants, a spa, a swimming pool and entertainment theaters. Barona Valley Resort and Casino now offers restaurants, hotel rooms, a wedding chapel, an event center, and a golf course. The property is also planning to add an Asian-themed restaurant and to expand its poker room (Cruz, 2004).

Armed with these non-gaming facilities, casinos can now appeal to non-gamblers, rather than just their primary gambling target market. By building mega-resorts with must-see attractions and adding a wide range of entertainment options in addition to table and machine games, casino owners and operators have attempted to appeal to a broad range of customers and expand their customer base (CasinoMan, 2003; Dandurand & Ralenkotter, 1985; "Gaming Industry," 1994; LVOEG, 2004). In particular, Las Vegas casinos attempt to respond to a demand for more variety in entertainment, given a broader spectrum of people visiting Las Vegas, such as vacationers, conventioneers and tourists with their friends and family, as well as gamblers.

Entertainment has also been offered to draw customers away from other casinos and to encourage more frequent casino visits from existing customers. For instance, it was estimated that the Cirque du Soleil shows at MGM Mirage properties brought more than two million visitors into their casinos. Interestingly 80% of those visitors were guests staying at other hotels (Palmeri, 2004b). Additionally, casino customers appear to be increasingly sophisticated and demanding, as more people use casinos as an entertainment and leisure time destination. Only 5% of visitors said that their primary intention in Las Vegas visits was gambling, whereas 65% said vacation or pleasure (Las Vegas Convention and Visitor Authority [LVCVA], 2003). However, it is unknown whether these entertainment-driven or non-gaming-oriented people play casino games or not, and if they do, how much.

Despite a variety of entertainment options within casino environments, it appears that gaming still remains center stage among all operations within a hotel casino. The expansion of product offerings under one roof is based on the assumption that visitors would eventually engage in gaming on the casino floor, once they are lured to a property by these offerings (Christiansen & Brinkerhoff-Jacobs, 1995; Dandurand & Ralenkotter, 1985; Roehl, 1996). With respect to show entertainment, Steve Gabriel, Vice President of The Booking Group, supported the idea that the major role of shows is to build traffic, thus complementing casino gaming. He stated, "Most casinos don't offer entertainment for the purposes of making money from it," (Guier, 1999, p. 13). According to him, their goal is to attract potential gamers rather than to generate profits from entertainment. To entice the potential gamers, casinos offer perks such as show tickets. More often than not,

it is not an issue for casinos to sell show tickets. Hence, casinos typically do not spend substantial money to promote their shows.

Additionally, diverse entertainment options are useful in discouraging guests from leaving the premises to gamble at other casinos (Binkley, 2001a; Richard, Platerink, & Arnold-Baker, 2001; Roehl, 1996). In fact, Caesar's Palace Hotel and Casino was concerned about show attendees leaving for other Strip properties after Celine's show, primarily because of the lack of restaurants and nightclubs to entertain the attendees (Binkley, 2003). The availability of various entertainment offerings is convenient for customers, as it provides an immediate, readily available 'on-site' entertainment break from the gaming tables. If other entertainment options and services are available at the property, customers will invariably remain longer and in turn, be more inclined to spend additional gaming funds at their original location. This is truly a case of providing an ultimate gaming and entertainment experience through convenience, in a sense the goal is to offer a one-stop destination that will retain clients as opposed to watching those same clients go elsewhere for amenities. Hence, the presence of diverse entertainment offerings could help casinos retain gamblers and increase the length of play. This will, in turn, contribute to additional revenues for the casino.

In addition to non-gaming amenities, low-margin games, such as bingo, keno and poker are often offered by casinos in hopes of an increased appeal to a large customer base and the complementary impact of the games on slot and/or table game revenues. For example, the casino examined in Lucas and Brewer's (2001) study maintained its bingo operation, despite the operation's annual loss for five years. With respect to the losses incurred by the bingo operation, casino management in the Lucas and Brewer's

study assumed that the losses could be justified by the incremental increases in slot revenues that the bingo players might generate.

Recently, poker has regained its popularity, and many casinos have reopened or are planning to reopen their previously closed poker rooms (Apuzzo, 2005). In 2004, Harrah's Entertainment, Inc. purchased the World Series of Poker event from Binion's Horseshoe Hotel Casino (Harrah's License Company, LLC., 2004). Despite the wave of poker popularity and related industry trends, its financial contribution to the property is limited. For casinos in Nevada, revenues from poker and pan were 1.3% out of total gaming revenues in 2005 (Nevada Gaming Control Board [NGCB], 2005a). However, testimonials from industry professionals suggest that poker has drawing power, attracting couples or groups of people with varied gaming interests (Apuzzo, 2005). For many destination hotel casinos, poker is a must-have gaming offering equivalent to casino amenities, such as boxing, concerts and shows (Apuzzo, 2005). However, there is a lack of empirical evidence that can support this poker-related strategy.

Complementary Effects of Entertainment on Casino Gaming

Christiansen and Brinkerhoff-Jacobs (1995) claimed that entertainment is a complement to gaming in attracting customers to casino tables and slot machines. They emphasized that a careful selection of non-gaming entertainment is imperative to allow for seamless integration into more traditional casino operations. Despite a substantial investment in incorporating the entertainment concept into casino gaming, some attractions of the new Las Vegas destination resorts failed to attract a broad spectrum of customers and in turn extend their visit (Christiansen & Brinkerhoff-Jacobs, 1995). They contended that management strategies for casino gaming are different from those for

entertainment. One of reasons is the disparate nature of casino games and entertainment. With respect to their different natures, commercial entertainment, in general, is passive consumption, whereas casino gaming requires interactive engagement. Although some shows involve audience participation, they are still less interactive than casino games, such as blackjack that requires the player's decision to draw or stand. In particular, casino gaming evokes "chance and vertigo, or absorption in the game to the exclusion of everyday reality," (Christiansen & Brinkerhoff-Jacobs, 1995, p. 91).

Additionally, the ability to operate the entertainment business may not be a core competency of casino management. The volatile and unpredictable nature of the entertainment business and the customers' high expectations that are set by other entertainment giants, such as Hollywood and Disney, increase risks for casino operators unfamiliar with the entertainment business (Christiansen & Brinkerhoff-Jacobs, 1995). For instance, a Broadway show starring well-known entertainers may be unsuccessful, and the resulting return on investment disappointing, even though the show was well directed and financed (Christiansen & Brinkerhoff-Jacobs, 1995). Many casino operators presume that gaming is another form of entertainment. However, non-gaming entertainment may attract a particular type of customer who is entertainment-prone, but is not necessarily gaming-prone.

Christiansen and Brinkerhoff-Jacobs (1995) claimed that entertainment within a casino should lead people to casino games and augment or increase their capability to satisfy customer needs. According to them, some forms of entertainment could cannibalize leisure time for casino gaming and divert players' money away from casino gaming. This is because entertainment provides people with experiences similar to those

of casino games. For instance, interactive videos, feature films and video arcades would not be desirable in casinos because of their potential to take people away from casino gaming. They could compete with or serve as a substitute for casino games, cannibalizing leisure time and money. These entertainment options are also prevalent across the country. Video arcades, in particular, draw young people who are too young to gamble. Despite Christiansen and Brinkerhoff-Jacobs's claim, counter-intuitive thoughts can be easily found in some properties opting for child-friendly activity areas and a baby-sitting service for smaller children who should not be left alone. These services are offered so that gamblers can still gamble while a baby sitter cares for their children.

Christiansen and Brinkerhoff-Jacobs (1995) also claimed that historic showrooms, theme-oriented architecture, shopping facilities and a landscape environment are good complements to casino gaming. Showroom-type entertainment, revues and circuses draw traffic to the property because of the lack of opportunity for people to see such entertainment elsewhere. Additionally, a showroom becomes an amenity for established players and encourages additional guest spending. Shopping centers and live spectacles on the street, outside the casino, also build traffic and attract crowds to the casino, thus creating potential gaming volume. Interior and landscape architecture could go along with casinos and help to meet the customers' high expectation for themed environments. Once guests are attracted to the casino, other amenities, such as golf courses and swimming pools, are also effective in encouraging extended stays.

Samuels (1999) emphasized a synergistic relationship between casino gaming and non-gaming entertainment. He surmised that the development of non-gaming entertainment and recreation facilities is necessary because casino gaming alone may not

be sufficient to sustain tourism and economic activity, given the proliferation of casino gaming nationwide and the increasing competition. He developed ten factors and the relative importance of each factor in rating non-gaming recreation/entertainment facilities offered by hotel casinos in Las Vegas. The factors are as follows: (1) closeness of attraction/entertainment to gaming areas; (2) ability to draw people to the overall facility; (3) uniqueness of attractions; (4) longevity of attractions; (5) integration of unique entertainment into casino gaming; (6) degree of support for the overall guest experience; (7) capability to assist parents traveling with children; (8) overall length of the entertainment experience; (9) ancillary enterprise, such as food service and merchandising; and (10) costs of offering entertainment.

After his review of various non-gaming entertainment options, Samuels (1999) assigned the highest rating scores, 10 out of 10, to *Masquerade Village*, a show performed above the casino floor at the Rio Suites Hotel Casino. Overall, this show contributed successfully to the synergistic relationship between gaming and non-gaming entertainment, because it scored high on items such as proximity to a casino, no entry fees, uniqueness, and ability to modify the performance at every show time. The outdoor pirate show at the Treasure Island Hotel and Casino received a high score, 8 out of 10, because it grabbed people's attention and drew them successfully to the property. The exterior of the Luxor Hotel Casino with the Egyptian theme also had a high score, 9 out of 10, for the same reasons. Additionally, Samuels's recommendations concerning casino entertainment include (1) developing unique dinner theater attractions and shows with special effects and operational flexibility; (2) securing only themed and large-scale

rides instead of having many mediocre ones; and (3) creating theme-oriented environments by using attractions with a consistent theme.

However, as stated previously in this paper, most assertions about the role and the effectiveness of entertainment in the casino environment are based, at least in part, on personal observations or experiences in the gaming industry. These anecdotal assertions are somewhat subjective and may not represent the views of all industry professionals and gaming researchers. Although Christiansen and Brinkerhoff-Jacobs (1995) and Samuels (1999) advanced abundant theories regarding the role of entertainment in the casino environment, there is little empirical evidence to support their assertions. Hence, further investigation is necessary to understand the indirect effects of entertainment on the casino and to identify entertainment options that effectively complement casino gaming.

Hedonic Nature of Gaming and Entertainment

Titz, Miller, and Andrus (1998) described a gambling experience as hedonic consumption involving multi-sensory experience, fantasy and emotion. As an example of hedonic consumption in the casino environment, they described an excited gambler pulling a machine game's handle while fantasizing about winning the mega-millions jackpot and what he or she would do with it. Regarding the hedonic factors related to casino game choice, Titz et al. found that slot machine players were closely associated with *escapism*, suggesting less control and influence over the gaming activity. However, table game players were highly involved in *adventurism*, being aware of intricacies of games and taking initiatives to influence and control over play.

In addition to the hope of gaining monetary rewards from gaming, players visit casinos for a variety of reasons, including pleasure and entertainment. Casino patrons regard a casino as a get away from home and a place to mingle with people and to enjoy entertainment in spite of the fact that they may lose money gaming (Hope & Havir, 2002; Loroz, 2004). Many people visit casinos with friends or family members and enjoy dining, taking in a show and socializing, as well as gaming (LVCVA, 2003; LVOEG, 2004; Yoshihashi, 1993a). Many Las Vegas hotel casinos have been offering diverse shows and entertainment options in order to entertain hotel guests and players during their stay ("Gaming Industry," 1994; LVOEG, 2004).

Given the hedonic motives of casino visitation, entertainment could provide a viable rationale to visit a casino. Entertainment could create an energy level in the casino via the excitement it may contribute to the gaming environment. Rossi Ralenkotter, CEO of the Las Vegas Convention and Visitors Authority, stated, "It [entertainment]'s not a focus away from gaming—that's just one of the attractions that make up the excitement of the destination" (Rowe, 1994, p. 30). In fact, the findings of Harrah's nationwide survey revealed that show or entertainment attendance is the most favorite non-gaming casino activity (28%) among players (Harrah's Entertainment Inc., 2003).

Wakefield and Barnes (1996) also noted that non-price sales promotions for leisure services, such as special shows at casinos, events at baseball games, contests and drawings, are primarily designed to add entertainment value to the core service. These non-price sales promotions are often inconsistent with the core service offered by the leisure service provider (Wakefield & Barnes, 1996). Despite the hedonic value of non-price sales promotions for leisure services, Wakefield and Barnes found that these

promotions were not as influential a factor in continued patronage for loyal consumers as they were for variety-seeking consumers.

According to them, a constant stream of promotions may be necessary to entice variety-seeking consumers. This is because they could be "entertainment hoppers" who occasionally patronize the service provider, primarily when they are attracted by the stimulation or added value of different sales promotions (Wakefield & Barnes, 1996). Wakefield and Barnes recommended that management evaluate the marginal return on promotional costs generated by variety-seeking consumers, given the low degree of loyalty and promotion-prone characteristics of these consumers. Conversely, loyal customers were not much more inclined to promotions than "entertainment hoppers". For loyal customers, investment in improving the service environment was recommended to enhance consumers' perceived value of a leisure service. They claimed that increased perception of value could positively influence continued patronage. This could, in turn, decrease consumers' need for sales promotions and reduce the service provider's heavy reliance on expensive sales promotions (Wakefield & Barnes, 1996).

Wakefield and Barnes's (1996) findings have implications for casinos operators, given the various event-oriented casino promotions. Casino operators, particularly ones on the Las Vegas Strip, tend to define themselves in the entertainment business and thus offer entertaining casino promotions, such as special events and shows. Even though these promotions are not directly related to the primary business of casino gaming, casino operators spend a substantial amount of money on these promotions in hopes of attracting customers who will also play casino games. These events and shows may also enhance

visitors' positive casino experience and hedonic consumption values, thereby increasing loyalty.

However, the success of casino promotions may depend on customer type, such as gaming-oriented customers and entertainment-seeking customers. Casino promotions could be effective in increasing the likelihood that new customers will visit a casino, particularly variety-seekers and promotion-seeking customers. However, offering events and shows to recurrent casino visitors may not be as effective as offering those to occasional visitors, in terms of increasing the frequency of casino patronage. Frequent gamblers may be less concerned about event-oriented casino promotions. Convenient casino location, gaming environment and game type may be more important factors in casino patronage. Casino promotions may not influence choice for loyal customers, although complimentary shows and events could function as rewards for their continued patronage and enhance their loyalty to the casino. Improving the perceived casino experience, via enhanced gaming environments and service quality, may influence customers' casino patronage and decrease a casino's spending on promotions.

However, little empirical evidence or grounded theory has been developed from past research in regard to the relationship between event-oriented casino promotions and gaming volumes. Additionally, little is known about the impact of entertainment's hedonic value on casino customers' patronage decisions and casino spending. The effectiveness of casino promotions in building customer loyalty and stimulating short-term gaming volumes, has not been a primary area of research attention. For example, the potential of "entertainment hoppers" becoming loyal customers may be low, given their promotion-prone and variety-seeking behavior. Hence, casino marketers may want

to develop appropriate value-added promotions for different customer segments. Further research is also needed to identify which hedonic factors enhance the beliefs and emotional reaction that the casino marketers are seeking. These factors could motivate casino customers' responses to promotions and influence their perceptions of the casino environment, as well as their casino spending and patronage decisions.

Showroom-Type Entertainment

Many hotel casinos in Las Vegas have been offering a variety of showroom-type entertainment for decades. Although some casinos have replaced lounge singers and showrooms with slot machines, lounge shows were an affordable way to reward guests, primarily because entertainment options were once limited ("Lounge singers," 1999). Casino operators assume that shows attract people who might not have otherwise visited the property or those who play at other casinos. These customers, drawn to the casino for shows, would hopefully end up playing casino games. Showrooms may already become an integral part of a casino, as a supporting product, complementing the core business, casino gaming. Supporting products help to draw and retain customers by adding value to the core business and differentiating it from competitors (Kotler, Bowen, & Makens, 2005). Steve Lippia, who performed at the Rio, stated, "At some point, people have got to step away from the tables and they'll go to see a show. People go to Treasure Island because of "Mystere" or Mirage because of Danny Gans. The entertainment becomes almost inseparable from the property," ("Lounge singers," 1999). Additionally, shows could create a pleasant or exciting environment.

Although shows may function as a primary draw and add excitement to the casino floor, the indirect effect of a show on the casino is unknown. There is a lack of empirical

evidence supporting the assumption that entertainment-seeking visitors have a desirable gaming profile. Some show-driven crowds may prefer not to play games at all, but they could enjoy other non-gaming entertainment in the casino. In fact, a casino could function as a primary draw, attracting more show traffic than a showroom attracts casino traffic, or casinos and showrooms may have a symbiotic relationship benefiting each other. Although a casino and a show can create synergy or the positive impact of co-branding by each providing a different but complimentary product, the effect of such cross-promotions could be asymmetric.

With respect to the role of a show in casino environments, Anthony Curtis, Publisher of the Las Vegas Advisor consumer newsletter, in his interview with the online magazine, *CasinoMan,* mentioned that a show itself could be profitable without help from the casino floor (CasinoMan, 2003). Samuels (1999) also mentioned that high costs of offering entertainment are not necessarily negative if the casino can draw patrons who pay full price for a show ticket. Their remarks suggest that a show could be an independent profit center rather than a complement to casino gaming or a loss leader. This would take place if demand was created for the show, and the revenue from the show was at least above operating costs of the showroom. In the case of the in-house or casino-owned show, ticket sales of the show would be another source of revenue for the casino.

The Relationship between Entertainment and Consumer Behavior

Entertainment and Gaming Behavior

Dandurand and Ralenkotter (1985) produced empirical evidence suggesting a positive relationship between the number of shows attended and the length of a visitor's stay,

based on the survey results of Las Vegas visitors' gaming behavior. They also found a positive relationship between the self-reported gaming budget and the length of stay. With respect to the profile of entertainment-prone visitors, the results of the study indicated that 31-50 year old white male visitors from the West, who are married and salaried employees, seemed more entertainment-prone. Their incomes fell between $25,000 and $40,000, and they travel without children, but with a large group. Those entertainment-prone visitors tended to assign higher importance to excitement and pleasure from entertainment. They were also likely to allocate more time to shopping, sightseeing and sports activities while in Las Vegas, and less time to gambling. However, they were more sensitive to the price of shows compared to other respondents.

The findings of their study, however, seemed conditional, as increases in trip length led to increases in the number of casino games played and casino spending, as well as increased show attendance. If the study revealed any direct correlation between self-reported gaming budgets and the number of shows attended, the study could have provided casino executives with meaningful information about the magnitude of entertainment's indirect effect on casino revenues. Additionally, complimentary offers for hotel rooms, food, beverage and shows, which the respondents in their study might have received from casinos, could have influenced the positive relationships between the length of a visitor's stay and the number of shows attended, as well as the gaming budget. Casino marketers commonly use complimentary offers to influence players' gaming behavior. Finally, the study analyzed self-reported accounts of gaming behavior collected from surveys, which suggest possible biases in the results of the study.

With respect to casino patrons' repeat intentions, some literature examined the importance of entertainment in the casino patronage decision-making process (i.e., Pfaffenberg & Costello, 2001; Richard & Adrian, 1996; Shoemaker & Zemke, 2005; Turco & Riley, 1996). Richard and Adrian (1996) found a significant and positive effect of casino entertainment (i.e., bands, shows) on the likelihood of returning to casinos in Mississippi. Conversely, good entertainment was not ranked an important factor. This was evidenced when riverboat casino patrons were asked to rank the importance of 25 items related to their casino experience (Pfaffenberg & Costello, 2001). Shoemaker and Zemke (2005) also found that good entertainment in the bars and lounge areas had no significant influence on Las Vegas local residents' choice of casinos. In their study, the entertainment-related item ranked 24th out of 24 attributes, which the residents considered important in choosing one casino over another in terms of top-box ratings (i.e., a rating of 9 or 10 on a 10-point Likert-type scale). In fact, convenience was the most important factor affecting local residents' decisions of which casino to visit.

Turco and Riley (1996) also found that "closest location" and "time most convenient" were important choice factors influencing casino selection for Chicago riverboat casino patrons. "Favorite place to play" was the most-cited factor in their study. Additionally, they examined alternatives in lieu of gambling, which could compete for customer's time and discretionary dollars. Frequently cited alternatives were television viewing (31.3%), dining out (25.7%) and shopping (23.1%). The researchers emphasized the importance of providing gambling substitutes to satisfy gamblers, particularly those who gamble for fun and entertainment rather than monetary gains. According to them, these customers are more likely to be affected by alternative activities when making the decision of which

casino to visit. Despite their assertions, little empirical evidence has been produced that suggests the significant impact of alternatives on casino choice and gaming volume.

In interpreting the results of these choice-modeling studies, caution is needed. In both studies done by Richard and Adrian (1996) and Shoemaker and Zemke (2005), only one item was used to measure the importance of casino entertainment. This item loaded on a factor named "Table Games" in Shoemaker and Zemke's study and "Hospitality" in Richard and Adrian's study, along with other items, which were not closely associated with casino entertainment. "Hospitality" as a factor had a positive influence on a casino patron's repeat intention. However, the "Hospitality" factor was comprised of one entertainment-related, one beverage-related and three food-related attributes. With respect to research design, Turco and Riley (1996) did not specify scholarly literature to support their adoption of choice factors or the process of selecting choice factors. Given that many studies across different industries have identified various choice factors, their list of choice factors was not exhaustive.

Additionally, the above-mentioned studies examined consumer choice factors in a local or day-trip market. Contrary to a repeat client and/or a day-tripper patronizing local casinos, a tourist visiting Las Vegas Strip properties could assign higher importance to entertainment (Kilby, Fox, & Lucas, 2004). Tourists may be less location-sensitive when selecting a destination casino-resort. They may be willing to travel to a more distant or less convenient casino if the casino offers unique attractions and amenities. Although entertainment has not been found to be a highly ranked choice factor in a local or day-trip market, there could still be a meaningful relationship between entertainment and casino patronage. However, there is a lack of relevant empirical evidence. Hence, more studies

across different markets are necessary to establish the generalization of the previous choice modeling findings.

Finally, casino customers may not perceive entertainment as an important attribute in selecting a casino because they may be faced or inundated with many entertainment options. In fact, one of the commercial websites featuring shows (Tickets Guaranteed, 2005) listed 133 shows offered by Las Vegas casinos. This number did not include lounge acts or other kinds of free entertainment. Given the multitude of competitive show offerings, evidence of complementary effects of a show on the casino would be helpful in justifying the presence of a showroom within a casino.

Entertainment and Gaming Volume

The majority of anecdotal literature noted the complementary effect of casino entertainment on gaming volume (i.e., CasinoMan, 2003; Christiansen & Brinkerhoff-Jacobs, 1995). However, little empirical research associated with the indirect effect of entertainment on gaming volume was identified. Roehl's (1996) study was related to the current work. He found a positive effect of entertainment on an individual player's casino spending. He produced empirical evidence supporting the positive contribution of casino amenities, such as showrooms and restaurants, to gaming revenue. Specifically, large or small-scale show attendance and the use of coffee shops and gourmet restaurants were positively related to Las Vegas residents' annual gaming expenditures, whereas lounge show attendance and buffet patronage were not. He suggested that respondents attending large-scale and small-scale shows spent 155% and 247% more on gaming, respectively, compared to people who did not attend shows. With respect to the profile of show attendees, the higher the income levels were, the more large-scale show

attendance was. However, descriptive statistics of respondents' behavior revealed that 40% of respondents never attended any shows offered by casinos. Additionally, there was no significant relationship between show patronage and frequency of casino visitation.

Roehl (1996) highlighted the potential importance of casino amenities in enticing and keeping casino patrons on the premises. However, there are still gaps that further researchers could address. The final model for Roehl's study was composed of four types of casino amenities and three demographic variables. It only explained 23% of the variance in the residents' casino spending. When the variables associated only with casino entertainment were regressed on yearly casino spending, while excluding other independent variables, only 7% of the variance in yearly casino expenditures was explained. Although the study investigated a relative influence of a specific entertainment type on casino patrons' gaming expenditures, further examination of potential factors that could explain the remaining variance in gaming expenditures would be meaningful.

Additionally, self-reported accounts of gaming behavior might have biased the results of the study. Respondents might inflate their incomes or education levels while underestimating their annual gaming expenditures, either consciously or unconsciously. By overestimating their incomes or education levels, respondents might have wished to gain a prestigious image. By reporting less casino spending, they might have wanted to create a favorable image apart from problem gambling. Finally, the possibility of high correlations among the variables in the model, in particular, a correlation between income and education level, might have affected the statistical significance of variables.

Marketing Literature

Parsons (2003) assessed the effectiveness of various types of promotion in increasing consumers' shopping mall visits and expenditures. In the study, entertainment-based promotions were examined, including stage shows hosted by musicians and other performers, fashion shows, products, school and community displays, as well as market fairs. The study suggested that entertainment-based promotions could be effective in generating traffic. Conversely, these same promotions did not generate a proportional increase in shoppers' spending. This is based on analysis of the primary data gathered from a mall intercept survey and sales data of a shopping mall that were segregated by promotion type. Although entertainment may not directly lead to buying behavior, the study suggested that future researchers investigate hedonic values of entertainment because entertainment could influence consumers' switching behavior or could have moderating effects on buying behavior. The study also suggested considering promotional expenses of offering entertainment-based promotions to assess the net effect produced by entertainment.

In the area of retail marketing, Sit, Merrilees, and Birch (2003) examined the impact of entertainment on image differentiation of shopping centers. Entertainment within a shopping center, such as movie theaters, food courts, video arcades and special events (i.e., fashion shows), is thought to be able to differentiate one shopping center from others, enhance the center's ambience and provide shoppers with gratifying feelings, such as excitement and pleasure (Sit et al., 2003). With those entertainment attributes, retailers have attempted to entice consumers to their shopping centers, extend their stays, and ultimately increase sales revenues (Shim & Eastlick, 1998).

Sit et al. (2003) categorized entertainment into two types: (1) built-in specialty entertainment, such as theaters and video arcades, and (2) special event entertainment, such as fashion shows and exhibitions. Although focus group discussions revealed that entertainment experiences motivated customers' shopping center visits, the importance ratings of these entertainment types were relatively low compared to other image attributes representing a range of products, a choice of brands, the ease of store navigation, and the cleanliness of restrooms.

Additionally, Sit et al. (2003) segmented shoppers into six clusters by using entertainment types and other image attributes. Of particular interest to this study, shopping center patrons who were labeled "entertainment shoppers" were found to be mostly single teenage males with low annual incomes. This entertainment-seeking segment perceived a shopping center as a place for social meetings and leisure activity and assigned higher importance to entertainment and shopping center ambience, such as décor and background music. However, the contribution of those entertainment-prone customers to the shopping center's sales volume is unknown. With respect to "serious shoppers," the study found that widows over 55, with an average household income (the study did not specify the income), were more serious about shopping and interested in a food court than other respondents. More often than not, they used the food court for a break during or after shopping. Overall, the study emphasized the potential significance of entertainment to the marketing mix of a shopping center. However, research opportunities still exist to better understand the effects of various entertainment types on shoppers' decisions in choosing a shopping center, as well as on sales volume.

Loss-leader Promotion

In general, retailers' price promotions, such as price discounts and coupons, are believed to increase sales and store traffic (Blattberg, Briesch, & Fox, 1995). Loss-leader promotions are one of the most widely adopted price promotions. A loss leader is a retail item that is sold at a substantial discount or even below cost (Walters & MacKenzie, 1988; Walters & Rinne, 1986). In the retail industry, loss leaders are usually employed to increase store traffic, thereby stimulating sales of regular-price, high margin products, as well as those of promotional products (Walters & MacKenzie, 1988; Walters & Rinne, 1986). Loss-leader promotions are believed to attract additional shoppers to stores who would not have come to the store otherwise. Additionally, loss leader promotions could help a store build a price competitive image (Walters & Rinne, 1986). Walters and Rinne (1986), however, cited concerns related to "cherry picking." This refers to the phenomenon where customers, driven by loss-leader promotions, buy only the promoted items and do not purchase regular-price, non-promoted items. Hence, price promotions could generate incremental store traffic and not store profit, if the majority of shoppers show "cherry-picking" behavior.

With respect to a loss leader strategy in the casino industry, casino trade literature presents plenty of comments from casino owners and executives regarding an entertainment-related loss leader strategy. However, there is a lack of empirical investigation of the impact of entertainment on casino profitability. Little is known about shows affecting casino choice, whether or not entertainment-driven customers play casino games, and what other activities these customers engage in during their stay.

Show-related Loss Leader Strategy

As retailers employ loss-leader promotions to increase overall store sales via increased store traffic, casino operators employ a similar show-related loss leader strategy to draw people into the casino. Many shows offered by casinos have been loss leaders over the past several decades (Atlas, 1995; CasinoMan, 2003; Yoshihashi, 1993b). Although some shows become major attractions and produce profits on their own, it is not uncommon to see showgirls and slot clubs offering guests free tickets for shows. Show tickets are also one of the complimentary awards offered by casinos in appreciation of players' continued casino patronage. In particular, 70% of show tickets offered by casinos are complimentary for high rollers and other casino customers in Atlantic City (Guier, 1999).

Over the past years, some casinos, employing headliners, such as Bill Cosby, Harry Connick, Jr., and Frank Sinatra, have been known to operate shows at a considerable loss, as much as $10 million a year (Yoshihashi, 1993b). Alan Feldman, a spokesman for Mirage Resorts, stated, regarding a $32-million pirate battle show at Treasure Island, "but Lord knows we get no direct revenue from it" (Rowe, 1994, p.30). Despite the substantial cost of operating the show, he pointed out that the main role of entertainment is to get people into the casino and create excitement for crowds entering the casino (Rowe, 1994).

However, the prevalent assumption that a show drives gaming volume seems to not be enough to justify operating a show at a substantial loss. Giving away free show tickets could fill the showroom, but it might not be the best way for the casino to maximize profits. Customers who were attracted by entertainment could have absolutely no gaming

intentions. Placing a responsibility on entertainment to generate profits is increasing, along with the spreading availability of attractions and shows in casinos (Rowe, 1994; Yoshihashi, 1993b). Phil Hevener, a columnist and co-owner of a local entertainment magazine, stated, "Entertainment wasn't an end in itself, but something intended to bring in business, but that may be changing" (Yoshihashi, 1993b, p. B1). As his comment indicates, the perception of show business in a casino environment, mainly as a supplement for casino gaming, may be changing. It appears that casino operators are now attempting to turn complimentary non-revenue or profit generating activities or amenities into profit centers rather than cost centers. In fact, the early termination of "Avenue Q," the Tony Award-winning Broadway musical at Wynn Las Vegas, was partially due to the less-than-optimal profits that the show generated. Given the show's break-even point of $350,000 per week, the show was profitable, generating about $500,000 per week (Fink & Simpson, 2006). However, its potential profit with full showroom occupancy was about $1 million per week (Fink & Simpson, 2006).

Along with entertainment, low food prices, such as inexpensive buffets, have long been offered to generate traffic to the casino and retain players in the casino. However, emphasis on a food-related loss leader strategy is also changing. More food departments are generating their own profits rather than losing money while complementing gaming departments. For instance, the combined income statement of statewide casinos with the gaming revenues of $1,000,000 and over indicated that food departments experienced a 14% departmental loss in 1995 (NGCB, 1995). However, in 2005, they generated a 1.4% profit (NGCB, 2005a). This may, at least partially, be attributed to additional dining outlets and upscale restaurants within a casino, attracting more non-gamblers. In fact,

many food operations on the Las Vegas Strip are now offering multiple food choices, including brand-name restaurants.

Given the changing trends in non-gaming areas, the role of entertainment as a profit center could be more emphasized. If entertainment is not a major factor in casino patronage, casino operators should attempt to create a profitable showroom operation. Further, if the show itself does not produce positive cash flows, the showroom is certainly not the best use of floor space. In fact, some production shows do produce their own revenues. For instance, the "KA" show at the MGM Grand was expected to bring in $2 million a week, given the showroom's 1,951 seats and 10 shows a week at an average of $110 per ticket (Palmeri, 2004b). Based solely on ticket and merchandise sales, the MGM Grand estimated slightly less than the 18% of the return on its total investment (Palmeri, 2004b).

Regarding The Mirage's Siegfried and Roy show, Joyce Minor, Lehman Brothers casino analyst, mentioned that MGM Mirage received less than half the revenue from the show, which produced about $45 million in annual ticket sales (Simpson, 2003). However, the Siegfried and Roy show permanently closed after Roy's injury resulting from a tiger attack during a performance. When the show closed, Wall Street analysts were more concerned about the loss of the property's overall revenue from ancillary sales, due to the closing of the show, rather than the loss of the ticket sales revenue. Wall Street analysts mentioned in their interviews with *Las Vegas Review-Journal* that the financial damage caused by the show's closure would be more significant in the areas of retail, food, beverage and gaming than in the areas of the ticket sales revenue or the show-related revenue (Simpson, 2003). Although a show's direct contribution to the

company's bottom line is detectable in a financial statement, the incremental gaming revenue generated by show goers is less evident. Despite the industry professionals' anecdotal assertions regarding the Siegfried and Roy show's indirect effect, no empirical research or analysis were identified that directly addressed or quantified the additional revenues generated by show goers.

Food-Related Loss Leader Strategy

Lucas and Brewer (2001) and Lucas and Santos (2003) produced empirical evidence relevant to a food-related loss leader strategy. In general, lower food prices are believed to draw and retain customers on the casino floor and thus, generate additional gaming volume. Despite the different natures of entertainment and food, their findings have managerial implications for managing casino entertainment more effectively. Hence, their works were reviewed.

Lucas and Brewer (2001) measured the effects of casino-operated restaurant business volume (food covers) on gaming volume. In their study, food covers as a variable failed to increase daily slot business volume. This finding confounded conventional wisdom related to the food-related loss leader strategy in the casino industry. Despite the different natures of the casino and retail industries, their results are similar to those observed in the above-mentioned retail literature. Supporting conventional theory, Lucas and Santos (2003) produced results contradictory to the findings of Lucas and Brewer. Lucas and Santos theorized that the profitability condition of the restaurant operations examined in each study might have contributed to different results between Lucas and Brewer and Lucas and Santos. In Lucas and Brewer's study, the food department was

operated at a substantial loss, whereas the restaurants in Lucas and Santos's study were marginally profitable.

Despite a lack of consensus in the results of the two empirical studies, the authors of both studies addressed important issues relevant to restaurant operations in the casino environment. For example, whether the incremental gaming revenues generated by food-related promotions are sufficient enough to compensate for the loss on food operations, and how the operators could better manage casino-operated restaurants. They also noted that low prices for food could draw only "cherry-pickers" who take advantage of low food prices without gambling. Hence, loss leader pricing should be set, based on the expected effects of loss leaders on gaming volume. Overall, their study provided a better understanding of the food-related loss leader strategy in the casino industry and managerial implications for managing casino-operated restaurants more effectively. For further research, Lucas and Santos (2003) recommended an examination of the effect of cash food covers on gaming volumes.

Additionally, the complementary effect of a bingo room on gaming volume was examined in Lucas and Brewer's (2001) study. Despite bingo's operational loss for five consecutive years, the management of the subject casino continued the bingo operation under the assumption that bingo players are also avid slot players. The regression analysis uncovered a positive effect by the bingo headcount variable on slot handle, suggesting the complementary effects of bingo on gaming volume. Lucas and Brewer reported the average daily theoretical slot revenue of $17 per bingo headcount. However, they did not examine the economic significance of the results.

Marketing Literature

Some studies in the areas of marketing and promotion have examined the drawing power of price promotion, the effect of price promotion on store sales and the profitability of deal-prone customers to the retailer (Srinivasan, Pauwels, Hanssens, & Dekimpe, 2004; Walters & MacKenzie, 1988; Walters & Rinne, 1986). Srinivasan et al. (2004) analyzed store traffic and revenue generated by price promotions. They found that the majority of the promoted brands had no significant effect on store traffic and store revenue, although some national brands had a positive impact on both store traffic and revenue. Additionally, the study reported the negative effect of overall price promotions on retailer margins. Given the negative or low margins of loss leaders, they suggested that loss-leader items attracting only "cherry pickers" should be priced at positive margins not to harm store profits.

Walters and Rinne (1986) also examined the impact of price promotions, particularly loss-leader and double coupon promotions, on store traffic, store sales, sales of products on deal and non-deal products, and store profits. They found no significant impact of loss leaders on sales of non-promoted, complementary products. Although some loss leaders had a significant impact on deal sales and store traffic, increases in store traffic and sales came from low-margin promoted products. Additionally, the majority of customers who responded to the loss leader and double coupon promotions were from the store's regular customer base, rather than from other stores. Thus, the usefulness of loss leaders, as a competitive tool to draw customers away from competing stores, is questionable.

Similar results were produced in Walters and MacKenzie's (1988) study. By using a structural equation method, they examined both the direct and indirect effects of three types of price promotions on grocery store sales, traffic and profits. In their study, store traffic indicated the number of transactions from Monday to Sunday, gathered from the scanner system of a store. With respect to loss leader promotions, they hypothesized that loss-leader promotion would increase store traffic, loss leader sales and sales of non-promoted items. However, loss leader sales were hypothesized to have a negative effect on store profits because of the typically negative gross margins of loss leaders. Variables related to loss leader promotions were dummy variables representing the presence or absence of promotion for each loss leader.

As a result of their analysis, Walters and MacKenzie (1988) found that most loss leaders had no significant effects on store profits because loss leaders failed to influence store traffic or sales of non-promoted items. In other words, loss leader promotions were not effective in attracting additional customers to stores and increasing the sales of complementary, non-promoted products. Only one out of eight loss leader promotions increased store traffic significantly, and half of the loss leader promotions failed to increase loss leader sales. Additionally, loss leader sales were not influenced by store traffic. Although Walters and MacKenzie did not address the underlying reasons for unsatisfactory performance of loss leaders, part of the reason for the disappointing results could be competition among stores. Many stores place similar items on sale at competitive prices. Hence, any consumer can go to any of the competitive stores and purchase the identical loss leader items at similar prices. Due to the majority of the same items sold at stores, simply offering the same loss-leader items for sale is no longer

sufficient to have competitive advantages. In fact, retailers often compare prices with similar stores and reduce their prices to match competitors' price reductions. This same theory could apply to the casino industry. Given the multitude of competitive entertainment offerings, a show similar to the ones offered by competitors at similar prices may no longer provide casinos with a competitive edge.

Overall, the above-mentioned studies (Walters & Rinne, 1986; Walters & MacKenzie, 1988; Srinivasan et al., 2004) failed to support conventional wisdom associated with a loss leader strategy in the retail industry. The findings of these studies call for management's careful promotional planning and selection of loss-leader items in order to produce the desired effects of loss-leader promotions, minimizing the "cherry-picking" behavior and maximizing store profits. Blattberg et al. (1995) noted that the complementary effect of a promoted product category on other product categories is likely to depend on the types and characteristics of product categories. Finally, loss-leader prices should be carefully determined on the basis of the magnitude of expected revenues from additional shoppers to the store.

Real Estate Literature

The theoretical models developed by Brueckner (1993) and Eppli and Shilling (1995) focused on the analysis of space allocation in a shopping center to maximize profits. In their analyses, they suggested that a landlord or developer should consider the different spillover effects between retail tenants for optimal space allocation in a shopping center. A review of the shopping center space allocation theories would be helpful in gaining

perspectives of casino space allocation to a particular amenity, and estimating this amenity's indirect effect on gaming volume.

According to Brueckner (1993), developers should consider "externality generating abilities" of stores when allocating shopping center space to stores. Externality could be viewed as a spillover effect, in which a store benefits from the spillover of the customers pulled into a shopping mall by another store. For example, consumers attracted to a department store generate additional revenue that accrues to other mall stores. Externality occurs because shoppers, who wish to economize their time cost of shopping, patronize other stores during their shopping center visits (Brueckner, 1993). Shopping centers lure customers away from traditional commercial districts because they offer a variety of shops so that customers can buy multiple items in the same trip (Brueckner, 1993).

Brueckner's (1993) theory suggested that stores generating large externalities on other stores should be allocated more space, when all else is held equal. Although he did not differentiate between anchor stores (i.e., department stores) and non-anchor stores (i.e., small mall stores) in his analysis, he explained why anchor stores occupy relatively larger space than non-anchor stores. He noted that a department store is a strong generator of externality because it offers goods that are on most people's shopping lists, thereby increasing shoppers' visits to a shopping center. The traffic driven by a department store raises sales of other mall stores while reducing the true marginal cost of space allocated to the department store. Hence, a developer or landlord looks for a department store within a shopping mall, despite the relatively low rents paid by the department store.

Despite Brueckner's (1993) contribution to the development of space allocation theory, his analysis was based on a number of different behavioral assumptions. One of the assumptions was that a shopping center does not contain multiple stores selling the same kinds of products. He claimed that the presence of such stores would reduce the sales of competing stores or produce less than the optimal sales, even though competition among the similar stores could attract comparison shoppers to the shopping center. In reality, however, it is not difficult to find multiple stores selling identical items within a shopping center, although some shopping centers offer exclusivity to eliminate the duplicate of same type stores. Additionally, competing stores could produce higher sales at the aggregate level via increased traffic than a store enjoying monopoly power.

Eppli and Shilling (1995) provided a theoretical analysis illustrating how the cross-patronage effect between anchor and non-anchor tenants affects shopping center development opportunities. In their analysis, they assumed that there are two types of tenants: anchor and non-anchor tenants. They also employed the externality concept to model the cross-patronage effect. Their model indicated that anchor tenants draw consumers to the shopping center and positively influence the sales of non-anchor tenants when the cross-patronage effect between anchor and non-anchor retailers exists. In other words, anchor stores build traffic at the shopping center while non-anchor stores rely heavily on the traffic from anchor tenants for their business. Hence, the sales of non-anchor tenants are affected by the space leased by the anchors as well as the amount of space they lease, whereas the sales of anchor tenants are affected only by the amount of space they lease. Based on the theories suggested by Eppli and Shilling, Gerbich (1998) explained the observed behavior in which landlords do not allocate all the shopping mall

space to non-anchor stores. Despite the low rentals per square foot that anchor tenants pay, the externalities that the anchor stores generate help non-anchor stores afford to pay higher rentals (Gerbich, 1998). This enables anchor stores to lease a relatively large space from the shopping center.

Eppli and Shilling's (1995) model also suggested that, as the cross-patronage effects between anchor and non-anchor tenants increase, the development opportunities of large-scale shopping centers increase. This is because the higher cross-patronage effects lead to greater developer profits and more space in a shopping center allocated to the anchor tenants. In space allocation, Eppli and Shilling recommended that landlords consider factors, such as the sales volume per square foot of retail space and the estimated externality effects of the anchor on the non-anchor tenant.

It appears that some hotel casinos maintain a showroom within a casino for the same reason as the landlord keeps a department store. Showrooms could be viewed as a must-have amenity generating strong externalities. Even though a showroom might generate small profits or a substantial loss, people attracted to a show could produce benefits that spill over onto the casino. Although there are abundant anecdotal assertions claiming the presence of externality between a showroom and a casino, little empirical evidence exists regarding the showroom's externality generating ability. Additionally, unlike a department store that offers various goods on many people's shopping lists and thus generates strong externalities, a show may appeal only to the limited number of people with no gaming intentions and thus generate few externalities.

Given a paucity of empirical research in the area of this study's topic, it is important to question whether a show is a strong externality generator. Additionally, a study should

be undertaken to examine whether the magnitude of the externality or the incremental revenues generated by a show is sufficient enough to support the presence of a showroom within a casino. Although the theoretical work by Brueckner (1993) and Eppli and Shilling (1995) is related to retail (commercial) real estate, it could provide a guide in addressing problems, such as how to allocate casino floor space to various ancillary services and amenities.

When selecting the type and size of an individual ancillary service or amenity within a casino, casino executives should consider the spillover effect or externality generating ability of an establishment on gaming or other non-gaming revenues. The externality generating ability could differ by amenity or service type. Hence, casino executives must attempt to optimize externalities between establishments. An analysis of the interrelated externalities could help casino executives decide the optimal mix of casino amenities and thus maximize the property's overall profits. With respect to a show within a casino, the show itself should produce a significant amount of cash flows, if its externality is not substantial. Casino executives may want to allocate the showroom space to other revenue sources with strong externality, in an attempt to optimize the property's total revenues. If a considerable amount of gaming or non-gaming revenue is related to show traffic, the space allocated to the show could be expanded to generate greater externalities on other businesses within the casino.

Types of Show Contracts

In a conversation with John Shigley (personal communication, October 2, 2005), CFO at the MGM Grand Hotel and Casino, the author learned of three types of contracts,

which are commonly used in negotiating show-related deals between entertainers and casino operators. First, in *two-wall contracts*, the casino assumes some risk. Casinos may pay for some expenses related to audiovisual, box office operations and load-in (i.e., stage and equipment set-up costs). The entertainer or the show production company pays the remainder of the expense. *Two-wall contracts* attempt to split expenses and revenue or risk and return. For instance, the MGM Grand splits profits and production costs with the "KA" show production company (Palmeri, 2004b).

On the contrary, the casino assumes no risk with *four-wall contracts*. The entertainer or the show production company pays for all expenses and keeps all ticket proceeds. The casino does not benefit from the revenue stream generated by ticket sales. Additionally, the casino typically does not attend to the daily operation of their in-house entertainment choice, thus limiting any liabilities associated with the production and its overall management. *Four-wall contracts* are usually negotiated with big name entertainers. Without paying entertainer fees, casinos could use headliner shows as traffic builders. Finally, *three-wall contracts* fall between a *two-wall* and a *four-wall* agreement. Although show contracts could be categorized into three types, it is likely that no two deals are alike, and the "wall" nomenclature is designed to communicate the general structure of the deals.

One example of a *four-wall* contract is the Celine Dion show, where the entertainer and her production company keep all the ticket sales and pay the costs for the show (CasinoMan, 2003). The ticket price could be as high as $225 each. However, the unique characteristic of this deal was that Park Place Entertainment Corporation invested $95 million in establishing a new showroom for Celine Dion's live show at Caesar's

Palace Hotel Casino in Las Vegas. Despite Park Place's substantial investment in establishing the showroom, the company predicted that the show would not be a loss leader, as many have been over the years (CasinoMan, 2003). The company expected to garner a 20% return on additional business from the show attendees' additional spending on gaming and non-gaming activities (CasinoMan, 2003; Tiscali Music, 2003). Wallace R. Barr, a casino executive at Caesars Entertainment, mentioned that casino business volume usually increased during show nights (Palmeri, 2004a). However, David Anders, Merrill Lynch Casino Analyst, disputed the extra $30 to $50 spending per attendee proposed by Park Place, while claiming a greater amount of extra spending needed per attendee to achieve the 20% return (CasinoMan, 2003).

With respect to MGM Mirage's Cirque shows, an individual show attendee's additional spending on dinner or drinks at a property hosting a Cirque show was estimated at $30 (Palmeri, 2004b). Additionally, the "KA" show at the MGM Grand itself was expected to garner $2 million a week from 10 performances per week, with an average $110 show ticket cost, before its opening (Palmeri, 2004b). However, it is unknown whether the show is actually generating an extra $30 in revenues per show attendee.

Related Industry Trends

The casino industry has tried to incorporate different forms of entertainment into casino operations by offering concerts, sporting events and movie theaters all under the same roof as the casino. Along with the expansion, non-gaming operations, such as entertainment, attractions, restaurants, hotels and retail stores, are increasingly important

as other revenue sources for casinos (Alsop, 1983; Rowe, 1994; Yahoo! Inc., 2005a). Revenues from non-gaming operations are growing. In fact, they account for more than half of the total revenues for casinos in some casino markets (Yahoo! Inc., 2005a).

For example, MGM Mirage Corporation's annual report indicated that slightly more than half of the company's revenue came from non-gaming activities, such as hotel, dining, entertainment, retail and other resort amenities (MGM Mirage, 2005). Rod Petrik, lodging and gaming analyst for Legg Mason, mentioned that about 70% of the revenue generated by the Mandalay Resort Group's Strip properties was derived from non-gaming areas, while the other 30% was from gaming (Adams, 2004). The results of the LVCVA survey also supported the growing importance of non-gaming activities. Only 5% of visitors said that their primary intention in Las Vegas was gambling, whereas 65% said vacation or pleasure (LVCVA, 2003).

In regards to increasing entertainment offerings, a highly competitive casino market was mentioned as one of several main reasons for that phenomenon (Alsop, 1983; Samuels, 1999; Yahoo! Inc., 2005a;). Casinos are facing competitive pressure as gaming becomes more prevalent, accessible and accepted across the country (Roehl, 1996). Gaming alone may not be enough to attract/retain customers. Hence, the alliances of casinos with entertainment become necessary to gain or maintain a competitive advantage. Park Place's investment in a showroom was also partially due to the intense competition with competing properties, such as Bellagio and The Venetian on the Las Vegas Strip (CasinoMan, 2003). Additionally, different styles of shows and physical attractions could help casinos distinguish themselves from competitors.

Despite casinos' efforts to be perceived as a complete entertainment destination rather than simply a gambling venue, the indirect contribution of entertainment to the company's bottom line has not been clearly addressed by industry professionals or gaming researchers. Few published studies have examined the indirect effects of entertainment on the casino. Little is known as to whether or not entertainment-driven customers generate a sufficient amount of casino profits, at a minimum, to compensate for the operating costs of entertainment. In fact, casinos may compete against different forms of entertainment, as casinos and entertainment both compete for the same consumer's disposable income and leisure time.

Production Shows

Hotel casinos have started to adopt a production show as their major attraction since a stage spectacular, "Lido de Paris," introduced by Stardust Hotel Casino, became successful (LVOEG, 2004). According to Lee Solters, a Los Angeles-based publicist who represented Frank Sinatra for 26 years, casinos started to abandon traditional headliners and began to offer big-production shows, such as "EFX" and "Mystère," when the opening of the Mirage in 1989 spawned the building boom of mega-resorts on the Strip in 1990s ("Lounge singers," 1999).

Production shows, such as the Cirque de Soleil, have been introduced in an effort to respond to the shift in customer tastes and to entice families into the casino (Yoshihashi, 1993b). In particular, some shows are unique to Las Vegas. In fact, "Avenue Q" at Wynn Las Vegas and Cirque shows, such as "KA" at MGM, "O" at Bellagio and "Mystère" at Treasure Island, only perform in Las Vegas (Fink & Simpson, 2006; Palmeri, 2004b). The Cirque shows present live entertainment made with state-of-the-art

technology, featuring dancers, singers, musicians and acrobats. Other production shows offered in Las Vegas hotel casinos include "Zumanity" at New York New York and "Le Rêve" at Wynn Las Vegas. These shows are performed regularly in custom-built theatres or spacious showrooms. "Mystère," a longstanding Cirque du Soleil show, has been drawing crowds to its showroom for over ten years. Robert Baldwin, President of the MGM Mirage Resorts division, stated that Cirque shows help its casinos attract a desirable consumer who tends to be more "sophisticated and have high incomes" (Palmeri, 2004b, p.81).

Although production shows are more cost-effective than headliner shows, many casinos, including the subject property, invested millions of dollars in building a custom showroom to offer a physical space within a casino for show performances. Casinos also offer resources for box office operations and support show-related promotional activities. With respect to the size and costs of a showroom, Wynn Las Vegas resort offers a $100 million showroom with a seating capacity of 2,087 to feature a Cirque du Soleil show, "Le Reve" (Friess, 2005). Treasure Island offers a 1,500-seat showroom featuring Cirque du Soleil's "Mystere". The 4,100-seat showroom of Caesar's Palace Hotel and Casino is two to three times larger than the showroom for the competing "O" show at Bellagio (CasinoMan, 2003). "KA," a Cirque du Soleil show at the MGM Grand, performs in a custom-built 1,950-seat theater, which cost the casino $135 million (Palmeri, 2004b). Additionally, the MGM Grand paid half the cost of $30 million or more for costumes and crew.

Headliner Shows

Some cost-oriented casinos discounted the indirect effects of a showroom and have replaced expensive headliner shows with more cost-effective shows or events, such as production shows, revues, musicals, and sporting events, or eliminated casino entertainment completely (Alsop, 1983; Kaplan 1981; "Lounge singers," 1999). However, other casinos have maintained headliner shows because of image benefits from the show and the show's drawing power. By employing headliners, casino executives believe that the casino could establish an image as a boutique hotel for high rollers, while distinguishing itself from others (Yoshihashi, 1993b). Given similar slot machines and table games across all casinos, show image could function as a marketing tool or a competitive strategy, helping a casino position itself in the market and differentiate itself from its competitors.

Despite the significant costs of show production and operation, Las Vegas casinos may still have a competitive advantage with big-name entertainer shows. Elton John signed on a contract to perform a minimum of 75 shows for three years, in the 4,100-seat Colosseum at Caesar's Palace Hotel Casino (Bay, Hardin, Alonzo, & Welch, 2004). Rob Powers, the spokesman for the Las Vegas Convention and Visitors Authority, stated, regarding the Celine Dion show, "People are going to come out of that show thinking that that [it] was some of the best money they ever spent. You can only see a show like this in Las Vegas," (CasinoMan, 2003).

However, the uniqueness or allure that headliners have may be waning because people can watch big-name singers and entertainers on television or on a tour (Yoshihashi, 1993b). In fact, Barbara Streisand's rare performances in public made her a

strong candidate for New Year's concerts in 1993 at the MGM Grand casino in Las Vegas, and she garnered $20 million in gate receipts for her two concerts (Yoshihashi, 1993c). Additionally, the lack of big-name entertainers with massive appeal at an affordable price has been a growing concern for casino operators (Dadurand & Ralenkotter, 1985). John Giovenco, President of Hilton Hotels Corporation's casino division, stated, "There are so few star saloon singers remaining with drawing power who would be willing to come to Las Vegas at a reasonable price. There are no [new] Sinatras, Tony Bennetts or Perry Comos who appeal to a great number of people" (Yoshihashi, 1993b, p. B1). Additionally, the increasing number of large new stadiums across the country that allow entertainers to garner millions of dollars on a single tour, makes it difficult for casinos to compete, due to their relatively smaller showrooms (Yoshihashi, 1993b). David Attaway, Senior Vice President of Entertainment for the Aladdin hotel-casino, also mentioned the difficulty in bringing a star performer to the casino and offering a mainstay headliner show for the same reason ("Lounge singers," 1999a).

Broadway Musicals

Recently, some Broadway musicals have made their way to Las Vegas casinos. "Chicago" and "Saturday Night Fever" had runs at Mandalay Bay Resort and Sahara Hotel Casino, respectively. Other Broadway musicals, such as "Mamma Mia!" and "We Will Rock You," have been running nightly at casinos on the Las Vegas Strip. However, most Broadway shows performed in casinos were shortened versions rather than full-length musicals. These shows are mainly for building traffic for casinos, as well as for catering to gamblers, but not for distracting players from the gaming tables, so that casinos could maximize profits from the casino floor (Guier, 1999). Additionally, a 90-

minute version of "The Phantom of the Opera" will open in the spring of 2006 at the Venetian Hotel Casino. The show will take place at a brand new theatre, which will cost the casino $35 million (Bay et al., 2004). Despite the substantial costs, casino executives think that well-known musicals can consistently draw customers to showrooms and casinos. According to Troy Collins, a promoter at Electric Factory Concerts, Philadelphia, Broadway shows at Las Vegas casinos will be more successful than those at the casinos in Atlantic City, given that Las Vegas's larger resident market has no direct competition nearby. This is in comparison to Atlantic City with New York and Philadelphia nearby, already famous for show entertainment. However, just because a show is popular does not mean it can guarantee success. In fact, some Broadway shows, such as "We Will Rock You," "Forbidden Vegas," "Notre Dame de Paris," have closed due to financial constraints or a lack of broad appeal (Fink & Simpson, 2006). Additionally, it is still unknown whether entertainment will draw the right kind of customers who have gaming intentions. Entertainment-driven customers might be tempting to target, but they might divert from the casino's target segments.

Adult-Oriented Shows

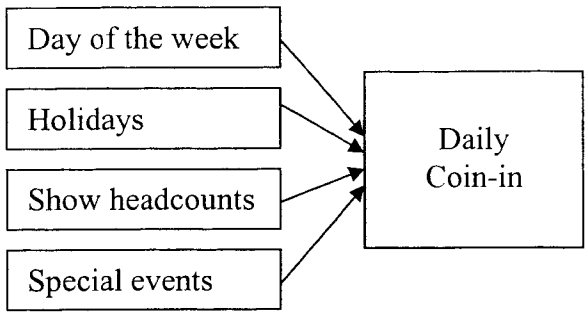
Regardless of the trend in the Las Vegas casino market to spend millions on attractions or production shows, adult-oriented shows, such as topless shows, have been continuously offered. The MGM Grand Hotel and Casino, which once attempted to reach out to families, left the family-oriented theme of the "Wizard of Oz" and introduced a $3 million stage show, "La Femme," featuring topless showgirls (Binkley, 2001b). The Stardust Hotel and Casino also invested $12 million in the adult show, "Enter the Night" (Yoshihashi, 1993b).

Additionally, for some casinos with limited budgets, it is hard to compete with multi-million dollar shows. For instance, The Riviera Hotel and Casino that targets low rollers, adopted the showgirl route instead of headliner shows as a repositioning tactic (Atlas, 1995). The Riviera, which employed big-name entertainers in the past to entice high rollers, has been offering old-fashioned shows performed by topless dancers (Atlas, 1995). The show was successful in attracting guests staying at other hotels, and cash flows for the casino increased after introducing the show (Atlas, 1995). Additionally, the show on its own became a profit center, producing revenue from cover charges (Atlas, 1995).

Models and Research Propositions

Despite the lack of empirical studies associated with the indirect contribution of entertainment to gaming volume, Lucas and Santos (2003) provided a platform for developing the current study's models. They examined the effect of casino-operated restaurants on gaming volume. As many shows in casinos, food has also been a competitive strategy to draw and retain casino customers. Lucas and Santos identified a significant effect of the food cover variable on gaming volume, in a model where eighteen variables were theorized to influence slot coin-in. Other variables examined in their study included monetary incentives via direct mail offers, days of the week and holidays. The current study modified their model and advanced two theoretical models to empirically examine the indirect effect of shows on gaming volume (see Figure 1).

Model 1



Model 2

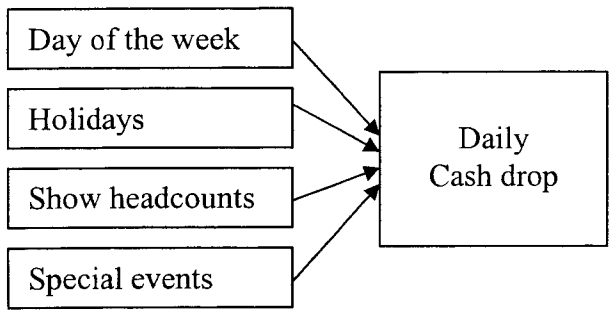


Figure 1. Theorized influences on slot coin-in/table games cash drop

The propositions that comprise the model (Figure 1) are as follows.

P1: Show headcounts will produce a positive effect on daily coin-in.

P2: Show headcounts will produce a positive effect on daily cash drop.

The proposed models include other variables previously found or theorized to affect gaming volumes. By incorporating these variables in a model, the effect of the show headcount variable can be isolated. Variables representing the days of the week and holidays were included in models, because the extended leisure time available during holidays and weekends could influence gaming volume, as well as the size of show audiences. Studies associated with casino promotions and operations (i.e., Lucas, 2004;

Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003) indicated positive and significant model effects for variables representing Friday, Saturday, Sunday and holidays. This suggested that the presence of, or increase in leisure time could lead to increases in gaming volume. In fact, casinos schedule additional dealers and service staff for weekend and holiday business levels.

Several marketing studies (Lam, Vandenbosch, Hulland & Pearce, 2001; Walters & MacKenzie, 1988; Walters & Rinne, 1986) have also found significant effects of these indicator variables on the volume of sales. Walters and Rinne (1986) produced a strong effect of the holiday variable on store traffic and sales of non-promoted items in their examination of the impact of price promotions on overall store performance. Walters and MacKenzie (1988) also found that the increased store traffic during holiday periods had a positive effect on sales of in-store promoted items at one grocery store.

Special events represent fights and concerts at one of the subject properties. In Lucas's (2003) study, the effect of special events was examined along with fifteen other variables. Special event was a binary variable, indicating the day on which a mass appeal popular entertainer appeared at the showroom of a neighboring property. Although the main focus of the study was to estimate the effect of match-play coupons on blackjack cash drop, the results of the analysis revealed a significant effect of the special event variable on cash drop. The impact of special events on gaming volume could be significant, given the large capacity of arenas or entertainment centers offered by some casinos. For example, the MGM Grand Garden Arena has a seating capacity of 17,157, and the Mandalay Bay events center offers a 12,000-seat theatre for the performing arts.

Additionally, other researchers have noted the complementary effect of special events on gaming volume (Christiansen & Brinkerhoff-Jacobs, 1995; Kilby et al., 2004).

In the current study, however, special event data for LV Hotel 1 were not available. Additionally, data relating to marketing/visitation incentives, hotel occupancy and food covers were also not applicable, despite their potential influences on gaming volume. Researchers noted a potential impact of hotel occupancy on gaming volume (Lucas, 2004; Lucas & Brewer, 2001; Lucas & Kilby, 2002). With respect to food covers, Lucas and Santos (2003) found a positive relationship between food covers and daily slot volume. In Lucas's (2004) study, match-play coupons were marketing incentives whereby the casino matched the amount the patron bets on certain table games. However, match-play coupons affected blackjack cash drop negatively.

Although data for the excluded variables were not available, the day-of-the-week and holiday variables are likely to represent at least a portion of the effect of food covers, marketing incentives and hotel occupancy variables on gaming volume. In Lucas and Brewer (2001), the indicator variables, representing the days of the week, holidays and trend, explained 80% of the variance in a casino's daily slot volume, and the magnitudes of the regression coefficients of these variables were substantial. Lucas and Kilby (2002) also mentioned that concomitant business volumes, such as hotel occupancy, showroom attendance and restaurant headcount (food covers), could be parsimoniously expressed via day-of-the-week variables. In fact, the hotel occupancy variable was omitted from analysis in Lucas (2004), due to the problematic multicollinearity. Additionally, the findings of some casino gaming literature (Lucas, 2004; Lucas & Brewer, 2001; Lucas &

Bowen, 2002; Lucas, Dunn, & Singh, in press) indicated relatively small or non-significant effects of marketing-related variables on gaming volumes.

From a methodological perspective, it is important to develop a parsimonious model. Although a researcher should be careful in selecting variables not to omit any critical predictor variable, too many variables can cause multicollinearity. Multicollinearity could mask the true model effects of a variable, and overfit the data while additional coefficients contribute only a small amount of model fit (Hair, Anderson, Thatham, & Black, 1998). Additionally, including more variables in the model could require an increased number of observations. Finally, a simple model could be easier to understand and to generalize than a complex model. Despite the limited number of variables in the proposed models, they were expected to explain a large variation in gaming volumes.

CHAPTER 3

METHODOLOGY

Introduction

This chapter begins with a description of data sources. The chapter continues with a discussion of the reliability and validity issues related to this study. Next, the main ideas of multiple regression analysis with correction for serially correlated errors are discussed. Finally, the chapter concludes with a description of research hypotheses and an explanation of the variables comprising the proposed models.

Data Sources

Internal and proprietary data, such as table games' daily cash drop and slot machines' daily coin-in, were gathered from the internal records and systems of the two subject properties located in Las Vegas, Nevada. During the data collection period, LV Hotel 1 and LV Hotel 2 offered a Broadway-style show and a production show, respectively. For LV Hotel 1, the property's daily coin-in, show headcounts and cash drop were gathered over a 214-day period from May 1, 2004 to November 30, 2004. For LV Hotel 2, 240 observations for each variable were collected, ranging from February 3, 2005 to September 30, 2005. The secondary data were subject to periodic audits by the regulators of Nevada Gaming Control Board (NGCB). The subject properties are owned by one of the two largest US gaming companies.

As previously discussed, complimentary show headcounts were excluded from total show headcounts as they could affect the model effect for the show headcount variable. Players who receive complimentary show tickets on a given day may obtain those awards as a result of that day's play. This condition could increase the correlation between show headcounts and gaming volumes. Separating regular-paying attendees from those with complimentary offers would enable researchers to better measure the effectiveness of a showroom in drawing players who are not provided with an incentive to patronize the property.

This study used secondary data. Zikmund (2002) listed the potential benefits of secondary data. Secondary data can be collected from existing sources and thus save the researcher time and expense compared to primary data gathering. Although secondary data are gathered for purposes other than researcher needs, secondary sources often provide a good starting point for exploratory research. In fact, research in finance and economics often employs secondary data to build a model in which relationships among variables are specified. Additionally, secondary data that are updated and current could be useful in decision-making.

Secondary data, particularly financial data and point-of-sale transaction data, are less likely to involve self-reported biases compared to self-reported accounts gathered from surveys (Houston, 2004). For instance, in order to create a good self-image, survey participants may respond to a question in a way that does not reflect how they really think or feel. They could over-estimate their behaviors viewed as socially desirable by interviewers or other participants, or under-estimate those viewed as less desirable. Further, the way survey questions are framed or asked could affect participants'

responses. Hence, this study, which employs proprietary and internal performance data gathered from systems designed for accounting purposes and performance analysis, is less likely to be affected by self-reported biases. The use of objective performance data, in turn, is likely to produce more accurate findings. Additionally, secondary data analysis could provide additional pieces of empirical evidence related to the area of this study, and thereby complement the findings of previous studies that relied on mostly self-reported accounts gathered from surveys. However, secondary data do not provide process measures, such as attitudes or motives, even though they do provide final outcomes, such as actual buying behavior (Houston, 2004).

Reliability

Zikmund (2002) defined reliability as the degree to which measures are free from errors and thereby consistently produce similar results. Cronbach's alpha is a common measure for assessing reliability. It measures the extent to which a set of multi-items represents a single construct (Churchill, 1995). High inter-item correlations among items imply that they are measuring the same construct. However, Cronbach's alpha was not applicable because the current study did not employ multi-items to describe a single construct. In this study, single indicators obtained from secondary data could directly represent the properties of their corresponding constructs. For example, coin-in was the measure of slot business volume, indicating the total amount of money wagered in all gaming machines.

The secondary data used in this study were obtained from the internal records and systems of the subject casinos. In particular, the proprietary gaming data were gathered

daily in accordance with the company's internal guidelines via consistent data collection processes or tracking systems. The data were also subject to periodic and external audits by the regulators of the NGCB to ensure that the casinos paid taxes correctly and followed any applicable gaming regulations. Given the consistency in data collection over time and the credibility of the NGCB as an audit organization, the data used in this study appeared to be reliable and accurate. However, there might be possible concerns regarding unavoidable human errors in collecting or recording data. Reviewing the data for accuracy, if any, minimized these errors.

Validity

While the reliability of a measure is critical, it alone is not sufficient. Reliability is but a necessity for validity (Zikmund, 2002). It is important to examine how valid the measure is because it is possible to consistently measure the wrong thing. In general, validity refers to the degree to which a scale or an instrument measures what it purports to measure (Zikmund, 2002). There are different forms of validity, such as construct validity, predictive validity, content validity, internal validity and external validity. In particular, construct validity has three aspects, and they are convergent, discriminant and nomological. Content validity and external validity seemed most relevant to this study, given that the study used single indicators obtained from available secondary data.

External validity refers to the degree to which the results of an experiment can be applied to other groups or the external environment (Zikmund, 2002). Due to the limited setting of experimental conditions, laboratory experiments usually have lesser external validity than field experiments. Studies employing artificial laboratory experiments or

college students as substitutes or surrogates for business people often lack external validity. Given that this study employed internal and proprietary data collected from actual casinos, the results of this study may have high real-world applicability. However, the extent to which the results of this study could be transferable to other casinos is somewhat limited due to differences in casino settings, showroom operating strategies, casino clientele, or time period of the data.

Content validity refers to the degree to which the measure accurately represents the domain of the construct (Churchill, 1995; Zikmund, 2002). The content validity of the measures used in this study was evaluated based on executives' review and a literature review. A review of the literature on casino operations and marketing (i.e., Lam, Vandenbosch, Hulland & Pearce, 2001; Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003; Walters & MacKenzie, 1988; Walters & Rinne, 1986) revealed the common uses of the measures representing days of the week and holidays, in an attempt to account for seasonal effects. With respect to gaming volumes, measures, such as coin-in and cash drop, were commonly employed by researchers as the indicators of gaming volume (i.e., Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003). Additionally, in the gaming industry, it is uncommon to find financial documents reporting coin-in or cash drop as performance measures. Many system-generated reports contain these data. Discussions with casino executives also revealed the wide acceptance and use of coin-in and cash drop among industry professionals, as direct indicators of casino business volumes.

Despite wide acceptance, caution is still necessary when using drop as the indicator of table games' business volume. There are a number of factors that could affect the

calculation of drop. Examples are the foreign chip policy, cash wagering policy, false drop, effects of any marketing programs in place, and the use of rim sheets (Kilby, Fox, & Lucas, 2004). Foreign chips are bought at other casinos. Some casinos include these chips in a drop box, whereas others instead place them into the tray (float). If the casino policy allows foreign chips to become a part of the drop, the hold percentage will decrease. With respect to marketing programs, such as non-negotiable chips and match-play coupons, the inclusion of these chips/coupons in the drop box will decrease win and eventually the hold percentage. The casino's marker collection policy could also affect drop. If the casino policy requires a player to pay any credits owed at the table, prior to the player's leaving, the drop will be decreased by the amount owed by the player. This will result in a higher hold percentage than a looser policy that advocates collection at a later time. Additionally, the casino policy relating to cash wagers, whether the casino allows cash wagers or not, impacts drop. Even among the casinos allowing cash wagers, policies for treating these wagers are not identical, thereby affecting drop and hold percentage differently. Lastly, if a player buys a large dollar-amount of chips but wagers only a small fraction of it or plays for a short period of time, it could distort table games' business volume by creating an artificially high volume measurement (false drop). As discussed above, drop could vary with changes in casino policies/procedures, and thus, it could be easily manipulated to produce a high hold percentage. For these reasons, using drop to compare table games' business volume between casinos is problematic. In this study, only cash drop, excluding credit play, was used. However, there are still limitations to the accuracy or validity of cash drop as a performance measure.

Nomological validity assesses the extent to which the measures of the construct under review relate to the measures of other constructs based on the relevant theory (Churchill, 1995). Previous studies related to this work suggested that an increase in leisure time induces more gaming tendencies. They found a positive and significant effect of temporal indicators representing Friday, Saturday, Sunday, and holidays on gaming volume (i.e., Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003; Walters & MacKenzie, 1988; Walters & Rinne, 1986). Hence, the empirical relationships between temporal indicators (i.e., days of the week, holidays) and gaming volumes (i.e., coin-in, cash drop) observed in this study were compared to the previously found or theorized relationships. However, research that addressed the relationship between show patronage and gaming volume was too scarce to produce evidence of nomological validity. To evaluate nomological validity regarding the impact of entertainment, further empirical evidence of the relationship, via a replication of this study by different researchers over time, is necessary. Triangulation, via multi-methods or multiple data sources, could also be helpful in understanding the phenomenon, building theory, and enhancing the validity of the findings. By examining whether the findings of this study are consistent with those of previous studies or theories, nomological validity can be assessed.

Multiple Regression Analysis

Multiple regression analysis is a statistical technique to examine the relationship between a single dependent variable and several independent variables (Hair, Anderson, Thatham, & Black, 1998). Multiple regression analysis investigates the changes in

independent variables on the dependent variable. With multiple regression analysis, the relative, as well as the collective, contributions of individual independent variables to the prediction or explanation of the variance in the dependent variable can be revealed. This study attempted to examine the explanatory power of a regression equation. Two separate regression analyses for each subject property were conducted: The first to explain the variance in daily coin-in and the second to explain the variance in daily cash drop. Each dependent variable was regressed against a set of independent variables. With multiple regression analysis, the unique effect of the show headcount variable was estimated after considering the effects of other variables, theorized or previously found to influence gaming volume.

Multiple Regression Assumptions

In multiple regression analysis, several assumptions related to the variables and the errors need to be fulfilled. When the assumptions are satisfied, regression models become more valid because of unbiased regression estimators and their minimum variances (Hair et al., 1998; Tabachnick & Fidell, 2001). As a result, assumptions of normality, linearity, homoscedasticity, and independence of errors were examined.

First, residuals were checked to examine whether they were normally distributed with zero mean and a constant variance. Second, the models were checked for the linearity assumption, which supposes that the independent variables are linearly related to the dependent variable. Third, homoscedasticity was assessed. Homoscedasticity is defined as the variance of the errors being constant across observations (Hair et al., 1998). In the case of heteroscedasticity, or the failure of homoscedasticity, the Ordinary Least Squares (OLS) estimators will become inefficient (no minimum variance). Hence, OLS estimates

are no longer deemed as a Best Linear Unbiased Estimator, or BLUE. OLS selects the regression line that minimizes the total sum of squared residuals. However, in OLS estimation with the heteroscedastic errors, observations with large error variances receive more weight than observations with small error variances. This is primarily because the sum of squared residuals related to large variance error terms is usually greater than the sum of squared residuals related to small variance error terms. By placing greater weight on observations with larger error variances, the regression line will minimize the total sum of squared residuals. However, observations with large error variances are likely to be departures from the true regression line. Hence, OLS will not provide estimated parameters with the smallest variances, even though parameter estimators are unbiased and consistent. Due to the biased variance of parameter estimates, statistical inference could be misleading.

There are several remedies available to correct heteroscedasticity. First, variable transformation could be considered (i.e., double-log model). For example, when logarithmic transformations are applied to variables, variable scales will be more compressed, reducing heteroscedasticity. Second, the standard errors via White's heteroscedasticity-consistent covariance matrix, or White's heteroscedasticity corrected standard errors, can be used. This method produces heteroscedasticity-consistent standard errors that are robust in the presence of heteroscedasticity. Hence, the statistics become robust to departures from the homoscedasticity assumption. The use of robust standard errors will not change the coefficient estimates produced by OLS. However, standard errors can change. These estimated standard errors are unbiased, and in turn will result in accurate test statistics and p values. Third, Weighted Least Squares (WLS)

can be used to correct the biases in standard errors and to produce more efficient estimates. However, the WLS approach is more complicated and requires more assumptions.

The final assumption made relates to the independence of the error terms. In multiple regression analysis, error terms are assumed to be independent. In other words, the error term for one period should not be correlated with the error terms from any preceding periods. Details are discussed in the below section.

Adjustment of Autocorrelation

The data used in this study (i.e., daily show headcounts and coin-in) were collected in sequence and referred to as time series data. In a regression model using time series data, the error terms are often correlated over time (Tabachnick & Fidell, 2001). Simply stated, the error in one period influences the other in another period. The correlation between the current error term and any of the previous error terms is termed autocorrelation, or serial correlation (Pindyck & Rubinfeld, 1998). A periodic fluctuation in data, such as seasonality, is another form of serial correlation (Tabachnick & Fidell, 2001). Serial correlation occurs when (1) the measurement error component of the error term is serially correlated or (2) the omitted variables in a model have a high degree of autocorrelation (Pindyck & Rubinfeld, 1998).

If the error terms are serially correlated, the assumption of the regression model, that the error terms are uncorrelated or independent, is likely to be violated. With autocorrelation, the regression estimates will become inefficient, even though they are unbiased (Pindyck & Rubinfeld, 1998). If, for a given sample size, the variance of an estimated regression coefficient is smaller than the variance of any other unbiased

estimators, the regression coefficient is referred to as an efficient estimator, and more valid statistical inference could be stated regarding the efficient parameter (Pindyck & Rubinfeld, 1998). With the presence of autocorrelation, however, the estimator is not efficient (loss of efficiency). This means that the variances of estimated regression coefficients and residuals would no longer be minimal, thus causing a loss of efficiency. However, in the case of positive serial correlation, this inefficiency will be masked by the fact that the estimated standard errors, generated by the least-square regression, are smaller than the true standard errors (Pindyck & Rubinfeld, 1998). This will inflate *t*-values, and consequently, the estimates of regression coefficients will appear to be more precise. In turn, this may lead to the conclusion that the parameter estimates are statistically significant when in actuality they are not. Hence, the null hypotheses are more likely to be falsely rejected. Finally, *F*-statistics using the residual variances would also be invalid, possibly leading to a false statistical significance.

There are several ways to detect the presence of any significant serial correlation in the residuals. One of them is to plot residuals against time. Plots are helpful in determining whether residuals corresponding to adjacent time points have similar values or not (Norusis, 2000). The Durbin-Watson statistic provides a test for significant serial autocorrelation (Norusis, 2000; Pindyck & Rubinfeld, 1998). A value of the Durbin-Watson statistic close to 2 means that the residuals are not correlated with each other. If the value is less than 2, it indicates the possible presence of a positive and serial correlation in the residuals of the estimated equation. If the value is greater than 2, it implies a negative correlation between successive values of the same variable. However, the Durbin-Watson coefficient only tests first-order autocorrelation.

The correlogram, or autocorrelation function (ACF), and the partial correlogram, or partial autocorrelation function (PACF), could also be visually inspected to examine significant residual autocorrelations according to lag. In terms of autocorrelation signs, deviations to the left of zero autocorrelation are negative, and deviations to the right of zero are positive. If there is no significant autocorrelation in the residuals, the correlations will be generally small. When no specific patterns in the residuals are identified after running a model without the ARMA terms, the original regression model with exploratory variables can be used. However, if serial correlation is present in the data, the Autoregressive—Movingaverage (ARMA) modeling approach can be used to model the information that the error terms contain. The ARMA errors can be added to the regression in order to handle serially correlated residuals (Harvey, 1990; Pindyck & Rubinfeld, 1998).

By specifying the appropriate autoregressive (AR) and moving average (MA) error terms in the regression equation, a multiple linear regression can be combined with an ARMA model for the error term (Harvey, 1990; Pindyck & Rubinfeld, 1998). In essence, AR and MA terms are akin to omitted variables as advanced by Pindyck and Rubinfeld. When the omitted variables are highly correlated, the error terms in the regression model are likely to be autocorrelated. This is mainly because the error terms possess information of missing or omitted variables. Therefore, the basic premise of a time series regression involving ARMA terms is to take out any information that the errors may retain. In this way, errors produced by a regression become uncorrelated. By correcting the serial correlation present in the data, regression models with ARMA errors provide more accurate and reliable regression estimates. Many researchers have employed

models using both explanatory variables and ARMA error terms. In relevant gaming literature, Lucas (2004) conducted multiple regression analysis with correction for serially correlated errors to accurately estimate the impact of redeemed match-play coupons on gaming volumes. By adding the appropriate ARMA errors to the equation, he removed autocorrelation.

The ARMA model is a combination of the AR and MA models (Harvey, 1990; Pindyck & Rubinfeld, 1998). In the autoregressive process of order p, or AR (p), the current observation can be expressed as a linear function of its past observations, going back p periods, plus a random disturbance in the current period. In other words, the current value can be regressed on its own past values, suggesting an auto (self) regressive model. Pindyck and Rubinfeld (1998) provided a review of the *first-order autoregressive process*, or AR (1). In AR (1), the observation in time period t depends on the observation in the previous time period t-1 multiplied by φ, plus a new error for time t, which is called *white noise*. The letter φ signifies the weight for the autoregressive term. *White noise* is assumed to be independent of any other errors that contain no further information over time, and be normally distributed with zero mean. In the *moving average process of order q*, or MA (q), the observation at time t is equal to the random error at time t, plus a weighted average of random errors at previous time periods going back q periods. If there is significant and negative autocorrelation at lag 1, adding MA (1) can be considered.

In ARMA modeling, the time series are required to be stationary, meaning the absence of noticeable trends or fluctuations in the rate of change over time. When a series is not stationary, log transformation or differencing can be used to stabilize the data.

If an ARMA model uses differenced data, it becomes an ARIMA (autoregressive, integrated, moving average) model. Further details regarding regression models with ARMA errors or ARIMA modeling were described in Pindyck and Rubinfeld (1998) and Harvey (1990). In this study, the effects of explanatory variables on aggregate daily gaming volume were quantified using a regression model with ARMA error terms. By adding ARMA terms to the regression equation, the parameter estimates in a regression model would better represent the effect of changes in the exploratory variables on the dependent variable, primarily because correlated errors are taken into account. However, the use of AR terms leads to the loss of observations equal to the highest order of serial correlation present in the error process.

Multicollinearity

The degree of multicollinearity in each model was assessed. Multicollinearity occurs when variables are highly correlated (Hair et al., 1998; Tabachnick & Fidell, 2001). In the presence of multicollinearity, variables contain redundant information or measure similar things. In other words, a variable can be explained by other variables in the same analysis. Hence, with the presence of multicollinearity, it becomes more difficult to isolate the effect of any single variable. Due to the interrelationship among variables, the unique variance explained by a single independent variable decreases while the shared variance among correlated independent variables increases. Additionally, the estimated regression coefficients and their statistical significance tests can contain bias if variables are highly correlated. One of the remedies for the problematic multicollinearity is to delete any redundant variables.

Outliers

Outliers are atypical observations that differ from the other typical observations (Hair et al., 1998). Hair et al. and Tabachnick and Fidell (2001) explained why outliers occur and how to handle them. When outliers occur due to mistakes, such as an error in data entry or coding, they should be identified in the preliminary data screening stage. If undetected, the outliers could be discarded or treated as missing values. On the other hand, outlying cases may provide important information. For instance, cases with extreme values could result from an extraordinary event. These outlying cases should be retained if they properly represent a part of the population from which the sample is drawn. A researcher can modify the model based on the examination of these outlying cases so that the model can account for such outliers. Additionally, some outliers may not appear in the univariate or bivariate outlier detection analyses. However, they may be detectable in multivariate tests. These multivariate outliers should be retained unless there is evidence that they represent mistakes (i.e., recording errors) or they are improper representations of populations.

The detection of outliers is imperative because one or a few outliers in the data set could distort statistical test results. In particular, least squares are sensitive to outliers and thus, regression coefficients can be easily influenced by extreme values. Outliers can be identified by visual examinations of the individual observations on each of the variables or standardized residuals. Plots, such as residual plots against fitted values, box plots and stem-and-leaf plots of the residuals, can facilitate the detection of outliers. Mahalanobis distance is a helpful method to identify multivariate outliers. Additionally, Cook's distance and DfBeta are measures to assess the changes in all and individual regression

coefficients, respectively, due to the influence of extreme values. To reduce the effects of outliers, variables can be transformed to form a normal distribution or the score(s) on the variable(s) for the outlier(s) could be changed to make outliers less abnormal (Tabachnick & Fidell, 2001).

Methodological Limitations

Multiple regression analysis is a statistical technique to model relationships between independent variables and a dependent variable. However, it does not directly address the issue of causation (Tabachnick & Fidell, 2001). Although regression analysis reveals relationships among variables, causal relationships cannot be determined. Other factors, such as unmeasured variables, could lead to a strong relationship between variables. To produce causal relationships, manipulation of independent variables via experimental research is necessary. However, casino management is often reluctant to conduct field experiments because the experimental design could interrupt a guest's play and thereby negatively affect the overall experience. Despite the methodological limitations associated with multiple regression analysis, this study provided a good starting point against which further research can be compared.

Research Hypotheses

Despite the lack of empirical evidence relevant to this study's topic, directional hypotheses were advanced. Given the conventional theory that show headcounts drive gaming volumes, the show headcount variable was expected to have a positive and

significant effect on gaming volume. Null hypotheses relating to the two models proposed in the current study were framed mathematically as:

$H_0 1$: $B_{E1} \leq 0$

$H_0 2$: $B_{E2} \leq 0$

B_E is the regression coefficient of the show headcount variable and the number next to the $_E$ represents a model. For example, B_{E1} is the regression coefficient of the show headcount variable in Model 1.

Hypotheses for the show headcount variables were tested at a .10 alpha level in order to detect any significant relationship between the show headcount and gaming volume variables. Exploratory studies involve a high probability of Type II error (O'Neil, Palisano & Westcott, 2001). Type II error is defined as the probability of failing to reject a false null hypothesis (Churchill, 1995). Hypothesis testing at a greater alpha level decreases Type II error. However, a Type I error, defined as the probability of rejecting a true null hypothesis, increases. Given the exploratory nature of this study, decreasing Type II error was more important to avoid failure in detecting any significant relationship between variables. To guard against the probability of Type II error, a .10 alpha level was used for hypothesis testing.

Additionally, given the directional hypotheses, a one-tailed test was used. For one-tailed testing, the *p*-values for a two-tailed test were divided in half. Variables representing the presence of leisure time (Friday, Saturday, Sunday, and holidays) and special events were tested at .05 alpha. These variables were expected to have positive and significant effects on gaming volumes and thus were tested via a one-tailed *t*-statistical test. However, midweek variables, such as Monday, Tuesday and Thursday,

were tested via two-tailed *t*-tests, because hypotheses for these midweek seasonality variables were not expressed directionally.

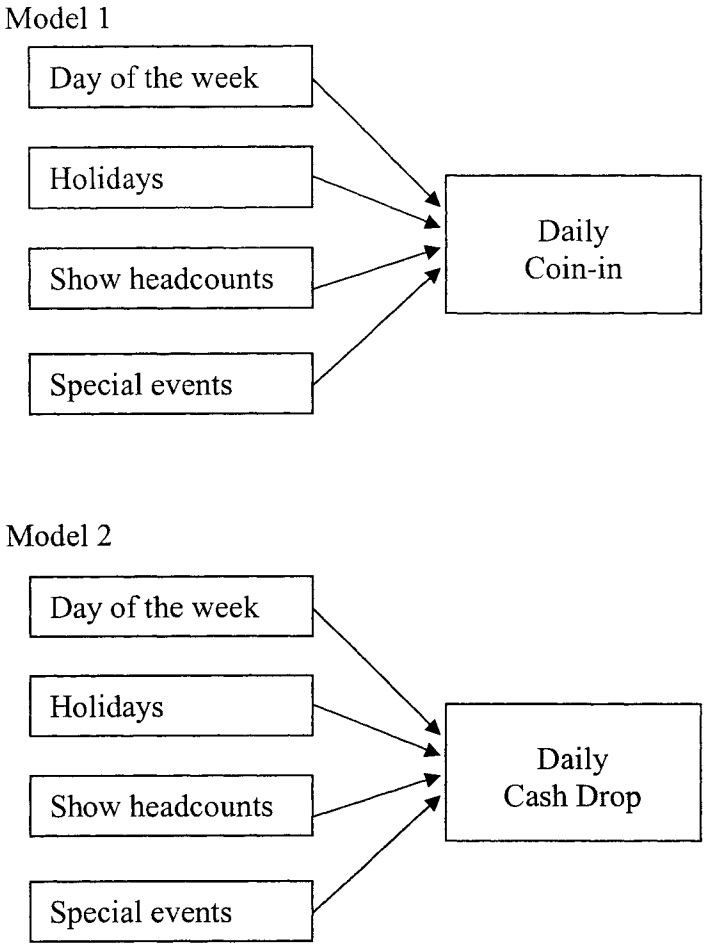


Figure 2. Theorized influences on coin-in/cash drop

Variables

As the advanced models indicate, coin-in and cash drop were dependent variables. Both the coin-in and cash drop variables were continuous. Coin-in represented the amount of money wagered per day in all gaming machines. Cash drop indicated the amount of currency and gaming checks in the drop boxes, counted for each day. As the models depicted in Figure 2 indicate, each dependent variable was linearly related to a set

of independent variables, which represented multiple sources of influences on gaming volumes.

The show headcount variable was continuous, and it indicated the total number of attendees in a showroom each day. Variables related to the days of the week were Monday, Tuesday, Thursday, Friday, Saturday, and Sunday. They were binary variables representing the effects of daily seasonality. Tuesday, Wednesday, or both days together served as the base period in models. Holiday variables were Columbus Day, Presidents' Day, St. Patrick's Day, Memorial Day, Mother's day, Independence Day, Labor Day, Easter, Thanksgiving, and Super Bowl Sunday. A binary variable that was set to one for particular holidays was created for each holiday. Finally, special events represented fights and concerts at one of the subject properties. The special event variable was a binary variable that indicated the presence or absence of a special event. A value of one was assigned to days with a special event and zero for days without a special event. The variables representing Fridays, Saturdays, Sundays, holidays and special events were expected to have positive and significant effects on gaming volumes.

CHAPTER 4

RESULTS

Introduction

This chapter presents data screening procedures, descriptive statistics and the outcomes of multiple regression analyses. The chapter also discusses whether the proposed hypotheses were supported by data or not. Finally, multiple regression diagnostics are discussed.

Data Screening

Prior to statistical analysis, the data were screened for data entry accuracy, missing values and outliers. For purposes of data screening, SPSS version 11.0 and E-views version 4.1 were used. An initial observation of the data did not disclose any obvious outliers. Hence, the total number of daily observations was used for initial analysis.

Daily cash drop and coin-in line graphs were drawn to examine if any patterns developed over the sample period. The line graph of cash drop exhibited a weak, downward trend during the sample period. However, the line graph of coin-in appeared to have no specific patterns. Hence, a trend variable, which depicts the linear trend in cash drop, was added to models. A trend variable is often employed to account for any seasonal fluctuation in data. For instance, Lucas (2004) included a variable representing a linear trend in a model designed to estimate the impact of match play coupons on

aggregate drop. In his study, the regression coefficient of the linear trend variable was negative and statistically significant. In the current study, the values of the trend variable ranged from 0 to 213 for Model 2 of LV Hotel 1, and from 0 to 239 for Model 2 of LV Hotel 2, given the sample period for each hotel's model. A value of zero was assigned to the first day of the time series, and the value of the trend variable increased by one each day, until it reached a value of 213 or 239 on the final day.

A review of drop-by-day and coin-in-by-day graphs indicated a sharp decrease in gaming volume on Tuesdays and Wednesdays, the exception being the drop data for LV Hotel 2. LV Hotel 2's drop-by-day graph indicated a slightly concave shape with the lowest gaming volume being present on Wednesdays. Tuesdays had the highest average daily gaming volume. Hence, in Model 2 of LV Hotel 2, only Wednesdays served as the base period from which other day-of-the-week variables might vary. In other models, both Tuesdays and Wednesdays served as the base period. For this reason, the outcomes of descriptive statistics and regression analyses did not contain variables representing Tuesdays, Wednesdays, or both.

The initial regression run was conducted with all variables present. This was repeated for all the proposed models. Initial estimation of each model showed a significant autocorrelation. The results of the Durbin-Watson test, which were produced by the initial regression runs, suggested the rejection of the null hypothesis of no serial correlation. Due to the presence of positive autocorrelation, adjustments to the regression equations were necessary. To remove any serial correlations present in the data, AR and MA terms were evaluated based on the ACF, the PACF and the corresponding Q-statistics. Based upon these reviews, the appropriate terms were added to the regression

equations. The regression models were re-estimated with ARMA errors. For subsequent regression analyses with ARMA errors, E-views version 4.1 was used. Following the addition of ARMA terms, the ACF and the PACF were examined to detect further autocorrelation among residuals. A visual inspection of a correlogram (i.e., ACF, PACF) for each model's residuals failed to indicate the presence of significantly correlated error terms.

Additionally, residuals, differences between the values predicted by the model and the observed data, were examined. Large residuals, called outliers, could have a significant impact on the regression coefficients (Norusis, 2000). In this study, there were residuals demonstrating fairly large differences between the observed values and the fitted values. When these residuals were reviewed, their observed gaming volumes were mostly higher than other days. For instance, there were peaks in coin-in from April 28 to May 1 in Model 1 of LV Hotel 2. Although no information or explanation regarding the days with high gaming volumes was available for subsequent analyses, the outlying observations might be possibly explained by the occurrence of a particular event. For instance, groups with avid slot/table games players, who were attracted by casino promotions, such as slot/table games tournament, could possibly explain a portion of the high gaming volumes. There might also be other reasons for these occurrences. Conversely, the outliers could simply be random variations.

Given the clear deviations present in the line graphs and residual plots of coin-in and cash drop, binary variables were created to account for days with high gaming volumes. Additionally, using MA terms requires continuous time series data without any missing or omitted values, as the MA process is generated by a weighted average of previous time

periods' random errors (white noise), plus the current period's random error (Pindyck & Rubinfeld, 1998). Hence, these observations were not removed, but included in models as dummy variables. A value of one was assigned for high gaming volume days and zero for other days. These variables were identified in Tables as 28-Apr, 29-Apr, 30-Apr, 01-Sep and so forth.

Adding these binary variables to the model will increase R^2 for the current data. However, it can overfit the model to the current data sample, thereby reducing the reliability of the model. On the other hand, omitting indicator variables can lead to bias as well. An example is an omitted variable representing the occurrence of the Thanksgiving holiday period in predicting retail sales. In a casino gaming context, redemption days for promotional gaming chips could correspond to unusually high levels of gaming volumes. Consequently, the regression results may be heavily influenced by a few outlying cases. Hence, incorporating indicator variables in the model was deemed to be reasonable. Additionally, casino executives are more concerned about a typical, normal day's gaming volumes for the day-to-day operation, rather than an extraordinary day with exceptional gaming volumes.

Assumptions of multiple regression analysis were examined. To examine the normality assumption, a histogram of the residuals was drawn for each model. A scatter plot of residuals vs. predicted values was examined for violations of homoscedasticity and linearity assumptions. A visual inspection of residuals plotted against predicted values indicated small departures from homoscedasticity in initial regressions. To avoid any serious bias in estimation, White's test for heteroscedasticity was conducted across all models. In Model 1 of LV Hotel 2, White's heteroscedasticity test failed to reject the

null hypothesis that the error variances are all equal. Hence, no corrections were necessary. However, in Models 1 and 2 of LV Hotel 1 and Model 2 of LV Hotel 2, heteroscedasticity was detected. White's heteroscedasticity test rejected the null hypothesis of homoscedasticity at .05 alpha, indicating the presence of heteroscedasticity.

Attempts were made to stabilize the variance by taking the log of the dependent variables. However, the remedial measure failed to show a noticeable improvement. Given the difficulties regarding the interpretation of the log-transformed values, the dependent variables were left in their original forms. To remedy the heteroscedasticity problem, the E-views program was used to compute White's heteroscedasticity-consistent covariance matrix of the parameter estimates. Without specifying the type of heteroscedasticity, White's heteroscedasticity-consistent covariance matrix of the parameter estimates helps to draw proper inferences based on least square results (Greene, 2003). In general, the OLS standard errors for the regression coefficients are likely to be smaller than White's corrected standard errors. Hence, statistical tests based on White's heteroscedasticity-consistent standard error estimates could be more conservative.

The estimation results generated by the regression with robust standard errors for heteroscedasticity were compared with the estimation results produced by the uncorrected OLS regressions. None of the coefficient estimates changed. However, some variables exhibited heteroscedasticity corrected standard errors slightly larger or smaller than the uncorrected standard errors. Consequently, *t*-statistics and *p*-values were inconsequentially different from previous regressions. For most cases, significance tests were not affected, despite the changes in *t*-statistics. Most variables maintained the status quo or exhibited a similar level of statistical significance. Their signs were also

consistent with those from earlier regressions. Hence, the statistical tests of the parameter estimates were conducted based on *t*-statistics obtained via White's heteroscedasticity-consistent standard errors. White's heteroscedasticity-consistent standard errors, *t*-statistics, and *p* values that were used in hypothesis tests were reported in the regression results section. The regression results without White's correction were also presented.

Collinearity diagnostics, such as Variance Inflation Factor (VIF) and Condition Index, were examined to assess the level of multicollinearity. Additionally, DfBetas and Cook's Distances were reviewed in all regression analyses to identify influential cases. Mahalanobis distances were also analyzed to determine the presence of multivariate outliers as well.

Descriptive Statistics

The characteristics of the data used in this study are described in Table 1 through Table 8. Each variable's abbreviated name is listed in brackets next to the variable itself. The frequency of observations for each binary variable was counted and listed in Tables. A bivariate correlation matrix of the variables in each model was also displayed in Tables.

LV Hotel 1: Model 1

The mean for the show headcount variable was 1,440.56, indicating the average number of show attendees per day. The average daily dollar-amount wagered in gaming machines was $2,570,370.

Table 1

Descriptive Statistics for LV Hotel 1's Model 1 Variables ($N = 214$)

	LV Hotel 1				
Variable Name	*M*	*SD*	*f*[a]	*Max.*	*Min.*
Daily Coin-in (COININ)	2,570,370.00	743,725.80	--	5,762,666.00	1,518,378.00
Show headcounts (SHOWCNT)[b]	1,440.56	456.65	--	3,297.00	0.00
Columbus Day (COLDAY)[c]	--	--	4	1.00	0.00
Independence Day (INDDAY)[c]	--	--	3	1.00	0.00
Labor Day (LABDAY)[c]	--	--	3	1.00	0.00
Memorial Day (MEMDAY)[c]	--	--	1	1.00	0.00
Mother's Day (MOSDAY)[c]	--	--	4	1.00	0.00
Thanksgiving Day (THSDAY)[c]	--	--	3	1.00	0.00
Monday (MON)	--	--	31	1.00	0.00
Thursday (THU)	--	--	30	1.00	0.00
Friday (FRI)	--	--	30	1.00	0.00
Saturday (SAT)	--	--	31	1.00	0.00
Sunday (SUN)	--	--	31	1.00	0.00
19-Aug	--	--	1	1.00	0.00
20-Aug	--	--	1	1.00	0.00
21-Aug	--	--	1	1.00	0.00
2-Oct	--	--	1	1.00	0.00
21-Oct	--	--	1	1.00	0.00
22-Oct	--	--	1	1.00	0.00
23-Oct	--	--	1	1.00	0.00

Note. [a]Frequency of observations where the binary variable was assigned a value of 1.
[b]Zero show headcounts were excluded for the calculation of mean and standard deviation ($N = 212$).
[c]A value of one was assigned for high gaming volume days before, during, and after the occurrence of a particular holiday.

Table 2 provides a bivariate correlation matrix of the variables in Model 1 of LV Hotel 1. A positive bivariate relationship between the show headcount and coin-in variables was produced ($R = .373$). It was significant at the .01 alpha level.

Table 2

Intercorrelations between Model 1 Variables for LV Hotel 1 ($N = 214$)

Variable	COININ	SHOWCNT
COININ	--	
SHOWCNT	0.373***	--

Note. *** $p < .01$, 2-tailed.

LV Hotel 1: Model 2

The average daily show headcount was 1,440.56. The average dollar-amount of daily cash drop was $561,107.

Table 3

Descriptive Statistics for LV Hotel 1's Model 2 Variables ($N = 214$)

	LV Hotel 1				
Variable Name	*M*	*SD*	*f*[a]	*Max.*	*Min.*
Daily Cash Drop (DROP)	561,107.10	223,869.50	--	1,211,010.00	190,445.00
SHOWCNT[b]	1,440.56	456.65	--	3,297.00	0.00
INDDAY[c]	--	--	4	1.00	0.00
LABDAY[c]	--	--	3	1.00	0.00
MEMDAY[c]	--	--	4	1.00	0.00
MOSDAY[c]	--	--	1	1.00	0.00
THSDAY[c]	--	--	1	1.00	0.00
MON	--	--	31	1.00	0.00
THU	--	--	30	1.00	0.00
FRI	--	--	30	1.00	0.00
SAT	--	--	31	1.00	0.00
SUN	--	--	31	1.00	0.00
Linear Trend (TREND)	--	--	--	213.00	0.00
18-Sep	--	--	1	1.00	0.00
19-Sep	--	--	1	1.00	0.00
6-Nov	--	--	1	1.00	0.00
19-Nov	--	--	1	1.00	0.00

Note. [a]Frequency of observations where the binary variable was assigned a value of 1.
[b]Zero show headcounts were excluded for the calculation of mean and standard deviation ($N = 212$).
[c]A value of one was assigned for high gaming volume days before, during and after the occurrence of a particular holiday.

Table 4 provides a bivariate correlation matrix of the variables in Model 2 of LV Hotel 1. There was a positive bivariate relationship between the show headcount and coin-in variables (R = .404). It was significant at the .01 alpha level.

Table 4

Intercorrelations between Model 2 Variables for LV Hotel 1 (N = 214)

Variable	DROP	TREND	SHOWCNT
DROP	--		
TREND	-0.082 ns	--	
SHOWCNT	0.404***	-0.020	--

Note. *** $p < .01$, 2-tailed. ns indicates not significant.

LV Hotel 2: Model 1

The daily show headcount was 3,419.51. The mean for the coin-in variable was $8,166,670, indicating the average daily dollar-amount wagered in machine games.

Table 5

Descriptive Statistics for LV Hotel 2's Model 1 Variables ($N = 240$)

	LV Hotel 2				
Variable Name	*M*	*SD*	*f*[a]	*Max.*	*Min.*
COININ	8,166,670.00	3,675,606.00	--	35,973,348.00	4,163,873.00
SHOWCNT[b]	3,419.51	506.21	--	3,900.00	0.00
Easter (EASTER)[c]	--	--	3	1.00	0.00
INDDAY[c]	--	--	3	1.00	0.00
LABDAY[c]	--	--	1	1.00	0.00
St. Patrick's Day (PATDAY)[c]	--	--	4	1.00	0.00
Presidents' Day (PREDAY)[c]	--	--	4	1.00	0.00
Special Events (SPEVNT)[c]	--	--	25	1.00	0.00
Super Bowl Sunday (SUPBOWL)[c]	--	--	4	1.00	0.00
MON	--	--	34	1.00	0.00
THU	--	--	35	1.00	0.00
FRI	--	--	35	1.00	0.00
SAT	--	--	34	1.00	0.00
SUN	--	--	34	1.00	0.00
28-Apr	--	--	1	1.00	0.00
29-Apr	--	--	1	1.00	0.00
30-Apr	--	--	1	1.00	0.00
1-May	--	--	1	1.00	0.00

Note. [a]Frequency of observations where the binary variable was assigned a value of 1.
[b]Zero show headcounts were excluded for the calculation of mean and standard deviation ($N = 147$).
[c]A value of one was assigned for high gaming volume days before, during and after the occurrence of a particular holiday.

Table 6 provides a bivariate correlation matrix of the variables in Model 1 of LV Hotel 2. The show headcount and coin-in variables produced a correlation coefficient of .227. This was significant at .01 alpha.

Table 6

Intercorrelations between Model 2 Variables for LV Hotel 2 (N = 240)

Variable	COININ	SHOWCNT
COININ	--	
SHOWCNT	0.227***	--

Note. *** $p < .01$, 2-tailed.

Hotel 2: Model 2

The average number of show attendees per day was 3,419.51. The average dollar-amount of daily cash drop was $3,798,069.

Table 7

Descriptive Statistics for LV Hotel 2's Model 2 Variables ($N = 240$)

	LV Hotel 2				
Variable Name	*M*	*SD*	*f*[a]	*Max.*	*Min.*
DROP	3,798,069.00	1,729,292.00	--	16,503,214.00	1,459,017.00
SHOWCNT[b]	3,419.51	506.21	--	3,900.00	0.00
EASTER[c]	--	--	2	1.00	0.00
MEMDAY[c]	--	--	3	1.00	0.00
LABDAY[c]	--	--	3	1.00	0.00
SUPBOWL[c]	--	--	5	1.00	0.00
MON	--	--	34	1.00	0.00
TUE	--	--	35	1.00	0.00
TREND	--	--	--	239.00	0.00
12-Feb	--	--	1	1.00	0.00
14-Feb	--	--	1	1.00	0.00
16-Feb	--	--	1	1.00	0.00
28-Feb	--	--	1	1.00	0.00
5-Apr	--	--	1	1.00	0.00
1-May	--	--	1	1.00	0.00
2-May	--	--	1	1.00	0.00
9-May	--	--	1	1.00	0.00
10-May	--	--	1	1.00	0.00
12-May	--	--	1	1.00	0.00
5-Jun	--	--	1	1.00	0.00

Note. [a]Frequency of observations where the binary variable was assigned a value of 1.
[b]Zero show headcounts were excluded for the calculation of mean and standard deviation ($N = 147$).
[c]A value of one was assigned for high gaming volume days before, during and after the occurrence of a particular holiday.

Table 8 provides a bivariate correlation matrix of the variables in Model 1 of LV Hotel 2. A bivariate correlation between the show headcount and cash drop variables, .175, was significant at .01 alpha.

Table 8

Intercorrelations between Model 2 Variables for LV Hotel 2 ($N = 240$)

Variable	DROP	SHOWCNT	TREND
DROP	--		
SHOWCNT	0.175***	--	
TREND	-0.209***	0.036	--

Note. *** $p < .01$, 2-tailed.

The Results of Multiple Regression Analyses

Regression analyses were conducted that included all independent variables representing show headcounts, holidays, days of the week, and special events. In some models, independent variables for certain holidays or days of week were highly insignificant. Each regression model was re-estimated after deleting the highly insignificant variables. Despite the absence of the insignificant variables, the significance and magnitude of the remaining variables' regression coefficients showed very minute changes. Variables that were significant in the earlier models remained significant with the expected signs. The changes in mean square error, which is the average of the square of the difference between the observed and the predicted values, was also minimal. Additionally, the subsequent regressions yielded more degrees of freedom. Hence, the following regression results did not retain the variables that were highly insignificant.

The subsequent regression analyses indicated that all regression models were statistically significant. Both Models 1 and 2 of LV Hotel 1 produced adjusted R^2s over .87, along with highly significant F-statistics. The regression coefficients of the show headcount variables were positively related to gaming volumes and statistically significant in both models. The show headcount variable in Model 2 of LV Hotel 2 was also statistically significant. However, Model 1 of LV Hotel 2 failed to support a positive relationship between show headcounts and coin-in. The following sections discuss the results of regression analyses and hypothesis testing.

LV Hotel 1: Model 1

The omnibus F statistic of 71.42 was significant at .05 alpha ($df = 21, 192, p < .0001$). The model explained 88.7% of the variance in coin-in, and produced an adjusted R^2 of 87%. The variable representing show headcounts produced a statistically significant and positive effect on coin-in ($B = 120.92$, $t = 2.38$, $df = 192$, $p = .0091$, one-tailed), resulting in the rejection of the null hypothesis. A one-unit increase in the show headcount variable produced a 120.92-unit increase in coin-in. In other words, coin-in increased by an estimated $121 for each show attendee.

As expected, the regression coefficients for the variables representing Fridays, Saturdays and Sundays were positive and statistically significant, ($B = 654{,}564.60$, $t = 7.41$, $df = 192$, $p < .0001$, one-tailed), ($B = 1{,}102{,}576.00$, $t = 12.84$, $df = 192$, $p < .0001$, one-tailed), ($B = 686{,}788.20$, $t = 9.20$, $df = 192$, $p < .0001$, one-tailed), respectively. The magnitude of these variables' coefficients was large. These results indicate that slot business volume during the weekend is higher than during midweek. The regression analysis also produced significant and positive model effects for some holiday variables, including Labor Day and Memorial Day ($B = 591{,}260.00$, $t = 4.05$, $df = 192$, $p < .0005$, one-tailed), ($B = 635{,}047.90$, $t = 4.28$, $df = 192$, $p < .0001$, one-tailed), respectively. Binary variables included in the model to correct for the observations with unusually high gaming volumes were all statistically significant at .01 alpha. Finally, ARMA terms, AR (1) and MA (14), were significant ($B = 0.67$, $t = 11.12$, $df = 192$, $p < .0001$, one-tailed), ($B = 0.21$, $t = 2.47$, $df = 192$, $p < .05$, one-tailed), respectively. It appeared that the effects of omitted variables were reflected in the error terms, even though those variables were not tested in the model. The results of the multiple regression analysis were

summarized in Table 9. The regression results generated without the use of White's heteroscedasticity-consistent standard errors are presented in Table 10.

Table 9

Summary of Multiple Regression Analysis for Variables Predicting Daily Coin-in: LV Hotel 1 ($N = 213$)

Variable Name	*B*	*SE B* [a]
(Intercept) [c]	1,897,988.00***	100,595.30
SHOWCNT [b]	120.92***	50.76
COLDAY [b]	1,000,332.00***	396,147.20
INDDAY [b]	440,118.10**	213,186.60
LABDAY [b]	591,260.00***	146,174.10
MEMDAY [b]	635,047.90***	148,545.50
MOSDAY [b]	1,008,109.00***	293,124.00
THSDAY [b]	610,234.00***	154,006.70
MON [c]	157,289.80***	58,242.96
THU [c]	154,194.10***	53,835.50
FRI [b]	654,564.60***	88,321.75
SAT [b]	1,102,576.00***	85,858.47
SUN [b]	686,788.20***	74,669.78
19-Aug [c]	2,129,376.00***	148,070.20
20-Aug [c]	2,153,958.00***	282,912.10
21-Aug [c]	1,940,782.00***	417,686.00
2-Oct [c]	-1,269,379.00***	229,200.90
21-Oct [c]	1,431,795.00***	188,293.70
22-Oct [c]	1,552,291.00***	343,801.10
23-Oct [c]	1,017,661.00***	374,499.40
AR (1) [c]	0.67***	0.06
MA (14) [c]	0.21**	0.09

Notes. [a] White Heteroscedasticity-Consistent Standard Errors. [b] One-tailed test.
[c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half.
*** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

Table 10

Summary of Multiple Regression Analysis for Variables Predicting Daily Coin-in With the Uncorrected Standard Errors: LV Hotel 1 ($N = 213$)

Variable Name	*B*	*SE B*[a]
(Intercept)[c]	1,897,988.00***	98,256.49
SHOWCNT[b]	120.92***	49.84
COLDAY[b]	1,000,332.00***	202,661.60
INDDAY[b]	440,118.10**	203,707.10
LABDAY[b]	591,260.00***	206,964.70
MEMDAY[b]	635,047.90***	216,609.50
MOSDAY[b]	1,008,109.00***	209,669.80
THSDAY[b]	610,234.00***	211,131.80
MON[c]	157,289.80**	63,600.34
THU[c]	154,194.10**	64,613.66
FRI[b]	654,564.60***	80,600.23
SAT[b]	1,102,576.00***	89,002.23
SUN[b]	686,788.20***	76,153.72
19-Aug[c]	2,129,376.00***	255,616.20
20-Aug[c]	2,153,958.00***	287,800.90
21-Aug[c]	1,940,782.00***	254,878.70
2-Oct[c]	-1,269,379.00***	217,289.20
21-Oct[c]	1,431,795.00***	261,764.50
22-Oct[c]	1,552,291.00***	290,360.80
23-Oct[c]	1,017,661.00***	258,636.70
AR (1)[c]	0.67***	0.06
MA (14)[c]	0.21***	0.08

Notes. [a] Standard errors without White correction. [b] One-tailed test.
[c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half.
*** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

LV Hotel 1: Model 2

A model designed to explain the variance in cash drop was significant, $F(18, 195) = 115.42$, $p < .0001$. The model explained 91.46% of the variance in cash drop, and the adjusted R^2 was 91%. As shown in Table 11, a significant and positive model effect for the show headcount variable was produced ($B = 28.01$, $t = 2.04$, $df = 195$, $p = .0215$, one-tailed). Hence, the null hypothesis that the coefficient for the show headcount variable is less than or equal to zero was rejected. For each show attendee, cash drop increased approximately by $28. A positive relationship between cash drop and show headcount was previously detected in the bivariate correlation matrix.

The *t*-statistics for the variables representing Fridays, Saturdays and Sundays were relatively large compared to other days, and their regression coefficients were positive and statistically significant ($B = 320,071.10$, $t = 14.12$, $df = 195$, $p < .0001$, one-tailed), ($B = 495,148.90$, $t = 21.23$, $df = 195$, $p < .0001$, one-tailed), ($B = 323,384.00$, $t = 18.51$, $df = 195$, $p < .0001$, one-tailed), respectively. Some holiday variables were statistically significant. Additional coin-in during the Labor Day holiday periods was estimated at $ 250,826. However, $94,692.21 less coin-in was estimated during the Mother's Day holiday periods than during non-holiday periods. The trend variable had a negative sign, although it was not significant at .05 alpha ($B = -258.66$, $t = -1.52$, $df = 195$). The negative sign was expected, given the negative correlation between the linear trend and cash drop reported in the correlation matrix. Binary variables included in the model to correct for the observations with unusually high gaming volumes were all statistically significant at .01 alpha. ARMA terms were also significant at .01 alpha. The results of the multiple regression analysis were summarized in Table 11. Regression results

without the use of White's heteroscedasticity-consistent standard errors are depicted in Table 12.

Table 11

Summary of Multiple Regression Analysis for Variables Predicting Cash Drop: LV Hotel 1 (N = 213)

Variable Name	*B*	*SE B* [a]
(Intercept) [c]	349,313.00***	29720.23
SHOWCNT [b]	28.01**	13.75
INDDAY [b]	128,133.60***	42924.26
LABDAY [b]	250,826.00***	52164.23
MEMDAY [b]	238,555.50***	66539.62
THSDAY [b]	134,364.50***	45765.96
MOSDAY [b]	-94,692.21***	33840.74
TREND [c]	-258.66ns	170.43
MON [c]	45,506.21***	13001.96
THU [c]	103,335.90***	10772.79
FRI [b]	320,071.10***	22668.47
SAT [b]	495,148.90***	23327.97
SUN [b]	323,384.00***	17473.00
18-Sep [c]	223,620.10***	25123.25
19-Sep [c]	251,390.80***	40201.33
6-Nov [c]	138,661.60***	37847.33
19-Nov [c]	229,355.60***	21315.75
AR(1) [c]	0.64***	0.07
MA(5) [c]	-0.22***	0.07

Notes. [a] White Heteroscedasticity-Consistent Standard Errors. [b] One-tailed test. [c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half. *** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

Table 12

Summary of Multiple Regression Analysis for Variables Predicting Cash Drop With the Uncorrected Standard Errors: LV Hotel 1 (N = 213)

Variable Name	*B*	*SE B* [a]
(Intercept) [c]	349,313.00***	27,453.56
SHOWCNT [b]	28.01**	11.92
INDDAY [b]	128,133.60***	50,396.94
LABDAY [b]	250,826.00***	52,444.81
MEMDAY [b]	238,555.50***	51,352.52
THSDAY [b]	134,364.50**	59,152.31
MOSDAY [b]	-94,692.21*	57,422.86
TREND [c]	-258.66ns	168.71
MON [c]	45,506.21***	15,195.98
THU [c]	103,335.90***	14,541.87
FRI [b]	320,071.10***	18,759.90
SAT [b]	495,148.90***	20,382.11
SUN [b]	323,384.00***	18,087.12
18-Sep [c]	223,620.10***	64,415.86
19-Sep [c]	251,390.80***	64,296.03
6-Nov [c]	138,661.60***	57,581.99
19-Nov [c]	229,355.60***	57,840.22
AR(1) [c]	0.64***	0.06
MA(5) [c]	-0.22***	0.08

Notes. [a] Standard errors without White correction. [b] One-tailed test.
[c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half.
*** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

LV Hotel 2: Model 1

This model explained 91.31% of the variance in daily coin-in, across the 239-day sample. The adjusted R^2 was 90.51%. The omnibus F statistic, 114.57, was significant ($df = 20, 219, p < .0001$). The regression coefficient of the show headcount variable was positive, but not significant ($B = 44.03$, $t = 0.84$, $df = 219$, $p = .4037$, one-tailed). This finding indicates a failure to reject the null hypothesis. It also failed to support the notion of a positive relationship between show headcount and gaming volume. It appears that LV Hotel 2's show is not very effective in building slot traffic.

As shown in Table 13, variables representing Fridays, Saturdays and Sundays had positive effects on coin-in ($B = 3{,}936{,}608.00$, $t = 12.79$, $df = 219$, $p < .0001$, one-tailed), ($B = 5{,}643{,}494.00$, $t = 16.31$, $df = 219$, $p < .0001$, one-tailed), ($B = 3{,}111{,}297.00$, $t = 10.89$, $df = 219$, $p < .0001$, one-tailed), respectively. Holiday variables with the exception of St. Patrick's Day were highly significant. In particular, the Easter variable produced a substantial increase in daily coin-in ($B = 2{,}643{,}461.00$, $t = 2.70$, $df = 219$, $p < .01$, one-tailed). Binary variables included in the model to correct for observations with unusually high gaming volumes were all statistically significant at .01 alpha. ARMA terms were also significant at .01 alpha. However, the regression coefficient of the special event variable was not significant, and the value of its t-statistic was quite small ($B = 94{,}411.60$, $t = 0.35$, $df = 219$, $p > .10$). The results of the multiple regression analysis were summarized in Table 13.

Table 13

Summary of Multiple Regression Analysis for Variables Predicting Daily Coin-in: LV Hotel 2 (N = 239)

Variable Name	*B*	*SE B*
(Intercept) [c]	5,565,175.00***	227,152.00
SHOWCNT [b]	44.03 ns	52.62
EASTER [b]	2,643,461.00***	979,206.30
INDDAY [b]	2,390,212.00***	986,980.60
LABDAY [b]	2,004,915.00**	911,106.10
PATDAY [b]	766,871.60 ns	808,453.60
PREDAY [b]	1,779,132.00**	806,685.00
SUPBOWL [b]	2,944,501.00***	898,745.70
SPEVNT [b]	94,411.60 ns	267,668.30
MON [c]	601,034.80***	225,406.10
THU [c]	1,323,461.00***	229,877.50
FRI [b]	3,936,608.00***	307,708.90
SAT [b]	5,643,494.00***	345,933.40
SUN [b]	3,111,297.00***	285,637.50
28-Apr [c]	10,163,855.00***	1,129,983.00
29-Apr [c]	20,348,112.00***	1,410,200.00
30-Apr [c]	23,544,951.00***	1,406,242.00
1-May [c]	6,958,137.00***	1,127,453.00
AR(1) [c]	0.74***	0.05
MA(3) [c]	-0.29***	0.07
MA(8) [c]	-0.19***	0.07

Notes. [b] One-tailed test. [c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half.
*** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

LV Hotel 2: Model 2

This model explained 69.67% of the variance in daily cash drop, and produced the omnibus F statistic of 26.60 ($df = 19, 221, p < .0001$). The adjusted R^2 was 67%. The show headcount variable produced a statistically significant and positive effect on cash drop ($B = 134.13$, $t = 3.27$, $df = 221$, $p = .0001$, one-tailed), supporting the rejection of the null hypothesis. For each show patron, slightly more than $134 of incremental cash drop was estimated. In this model, the Memorial Day and Super Bowl Sunday variables were highly significant ($B = 1{,}250{,}790.00$, $t = 5.35$, $df = 221$, $p < .0001$, one-tailed), ($B = 4{,}278{,}895.00$, $t = 4.64$, $df = 221$, $p < .0001$, one-tailed), respectively. The binary variables, which were added to the equation to account for the days with high gaming volumes, were all statistically significant at the .01 alpha level.

With respect to the variables that represent days of the week, this model's findings were somewhat contrary to the results of other models. Only the Tuesday variable was significant at .05 alpha. In fact, Tuesdays had the highest average daily cash drop. Other indicator variables representing Thursdays, Fridays, Saturdays, and Sundays were not significant in the initial regression model. Moreover, the variable representing Sundays did not exhibit the expected sign. Additional regression analyses were conducted with the absence of these variables. The regression results indicated that the significance of the remaining variables in the model was unaffected. The variables were still significant at .05 alpha or the lower alpha level. The changes in the magnitude of the regression coefficients were also minimal. Hence, the indicator variables representing Thursdays, Fridays, Saturdays, and Sundays were not included in the present regression results.

Additionally, the linear trend variable had a negative sign, but was insignificant. Regression results were presented in Table 14.

Table 14

Summary of Multiple Regression Analysis for Variables Predicting Daily Cash Drop: LV Hotel 2 ($N = 240$)

Variable Name	*B*	*SE B* [a]
(Intercept) [c]	3,251,109.00***	213,673.20
SHOWCNT [b]	134.13***	41.06
MEMDAY [b]	1,250,790.00***	233,913.10
SUPBOWL [b]	4,278,895.00***	922,221.40
LABDAY [b]	1,123,795.00ns	774,829.80
TUE [c]	415,242.10**	163,156.00
TREND [c]	-1,220.23ns	1,322.26
12-Feb [c]	3,510,449.00***	482,459.10
14-Feb [c]	3,025,229.00***	316,086.50
16-Feb [c]	3,244,578.00***	225,058.60
28-Feb [c]	4,074,868.00***	446,400.70
5-Apr [c]	2,795,271.00***	551,978.90
1-May [c]	6,864,155.00***	197,479.30
2-May [c]	4,337,925.00***	254,671.00
9-May [c]	2,201,846.00***	652,694.20
10-May [c]	11,874,458.00***	458,769.20
12-May [c]	6,397,711.00***	492,388.70
5-Jun [c]	5,904,068.00***	593,089.10
MA (6) [c]	0.26***	0.07
MA (8) [c]	0.18***	0.06

Notes. [a] White Heteroscedasticity-Consistent Standard Errors. [b] One-tailed test.
[c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half. *** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

Regression results generated without the use of White's heteroscedasticity-consistent standard errors are presented in Table 15. Without White's correction, the Labor Day variable was significant at .01 alpha.

Table 15

Summary of Multiple Regression Analysis for Variables Predicting Daily Cash Drop With the Uncorrected Standard Errors: LV Hotel 2 ($N = 240$)

Variable Name	*B*	*SE B* [a]
(Intercept) [c]	3,251,109.00***	210,249.70
SHOWCNT [b]	134.13***	42.59
MEMDAY [b]	1,250,790.00***	416,855.30
SUPBOWL [b]	4,278,895.00***	515,034.90
LABDAY [b]	1,123,795.00***	467,649.70
TUE [c]	415,242.10**	171,372.30
TREND [c]	-1,220.23 ns	1,371.32
12-Feb [c]	3,510,449.00***	986,276.00
14-Feb [c]	3,025,229.00***	977,564.40
16-Feb [c]	3,244,578.00***	960,391.40
28-Feb [c]	4,074,868.00***	951,430.90
5-Apr [c]	2,795,271.00***	965,480.90
1-May [c]	6,864,155.00***	959,689.30
2-May [c]	4,337,925.00***	961,639.00
9-May [c]	2,201,846.00**	963,971.80
10-May [c]	11,874,458.00***	977,317.80
12-May [c]	6,397,711.00***	946,995.60
5-Jun [c]	5,904,068.00***	948,749.90
MA (6) [c]	0.26***	0.06
MA (8) [c]	0.18***	0.06

Notes. [a] Standard errors without White correction. [b] One-tailed test. [c] Two-tailed test. The *p*-value for a one-tailed test was calculated by dividing the two-tailed *p*-value in half. *** $p < .01$. ** $p < .05$. * $p < .10$. ns indicates not significant.

The Diagnostics of Multiple Regression Analysis

A residual histogram and normal probability plot indicated an approximately normal distribution. Given the non-experimental data used in this study, some degree of multicollinearity was expected. However, collinearity diagnostics were at an acceptable level. VIFs were close to 2.0 or less than 2.0, failing to indicate violation of the multicollinearity assumption. With respect to the positive autocorrelation present in the data, the ARMA terms successfully accounted for significantly correlated errors in the residuals. The residual autocorrelations and related Q-statistics indicated no further autocorrelation remaining in the series. Additionally, there were some outliers exhibiting large residual values. However, an examination of these observations indicated that they were valid cases and did not present any serious problems. Lastly, a visual inspection of the predicted values vs. the residuals scatter plots was conducted to examine the evidence of nonlinearity or heteroscadasticity. These plots failed to indicate problematic homoscedasticity. Additionally, this visual inspection produced no indication of a curvilinear relationship in the data. The results of the diagnostics were displayed in Appendix I.

CHAPTER 5

DISCUSSION AND IMPLICATIONS

Introduction

This chapter discusses the theoretical implications of this research, including comparison of this study with other related works. The chapter continues with a discussion of the effect magnitude analysis. The next section discusses the managerial implications related to the model results. Lastly, this chapter lists both the limitations associated with this study as well as recommendations for future research.

Theoretical Implications

Conventional wisdom suggests that entertainment drives gaming volume. In this study, three out of four models supported conventional wisdom by indicating the presence of a significant relationship between show headcounts and gaming volume. In terms of magnitude, the regression coefficients of the show headcount variables varied by models and properties.

The Impact of Shows on Gaming Volumes: LV Hotel 1

The models designed to examine the effect of show headcounts on gaming volumes demonstrated a strong explanatory power. The show headcount variable had a positive and significant effect on both coin-in and cash drop, supporting the conventional theory

that show traffic contributes to casino business volume. This finding appears to indicate that LV Hotel 1's show clientele are casino players.

The positive effect of show headcounts on gaming volume provides theoretical support for Roehl's (1996) findings. Roehl (1996) found a positive relationship between show attendance and annual gaming expenditure. There is also abundant anecdotal literature that supports the conventional notion of entertainment as a complement to casino gaming (i.e., CasinoMan, 2003; Christiansen & Brinkerhoff, 1995; LVOEG, 2004). Additionally, the results appear to be consistent with the findings of Richard and Adrian (1996), as their studies found a significant and positive effect of casino entertainment (i.e., bands, shows) on the likelihood of returning to casinos in Mississippi. Despite the different nature between entertainment and food, Lucas and Santos (2003) produced similar results, suggesting a significant and positive effect of the variable representing food covers on gaming volume.

The significant model effect of the show headcount variable also implied the presence of the spillover effect between a showroom and a casino. Previously, Brueckner (1993) and Eppli and Shilling (1995) developed the theoretical models for space allocations in a shopping center under the assumption that inter-store externalities exist. Given the presence of externality, efforts to leverage current customers visiting LV Hotel 1's showroom would be helpful in maximizing any spillover effects and increasing gaming volume.

However, the findings relating to the models of LV Hotel 1 seem to be inconsistent with Walters and MacKenzie (1988) and Walters and Rinne (1986). Both studies examined the impact of price promotions, particularly loss leaders, on store traffic, store

sales and store profits. Although the show offered by LV Hotel 1, might not be a loss leader in itself, the conventional view of a show as a traffic builder is in the same vein as the conventional wisdom in the retail industry, which claims that loss leaders are effective in building traffic and stimulating store sales. Walters and MacKenzie (1988) found that most loss leaders did not have any significant effect on store traffic, overall store sales and store profits. Walters and Rinne (1986) also found no significant impact of loss leaders on sales of non-promoted, complementary products, although some loss leaders had significant effects on deal sales and store traffic. However, increases in store traffic and store sales came from low-margin promoted products rather than non-promoted, complementary products.

The Impact of Shows on Gaming Volumes: LV Hotel 2

Contrary to the findings related to LV Hotel 1, the show headcount variable had no statistically significant effect on coin-in of LV Hotel 2, failing to reject the null hypothesis ($H_0 1$). The show at LV Hotel 2 seemed to draw customers to the showroom; however, few made it to the casino floor. This finding failed to support the assumption held by many industry professionals and the conventional theory that entertainment drives gaming volume. The show at LV Hotel 2 seemed to not have any significant complementary relationship, in particular, with slot business volumes.

This result appears to be consistent with the findings of some choice modeling studies (i.e., Pfaffenberg & Costello, 2001; Shoemaker & Zemke, 2005; Turco & Riley, 1996). In those studies, good entertainment was not a critical factor in casino selection. For instance, Shoemaker and Zemke (2005) found that entertainment had no significant influence on local residents' choice of casinos. The casino's convenient location had an

importance rating higher than entertainment, and it significantly affected casino patrons' decision of which casino to visit (Shoemaker & Zemke, 2005).

The absence of any statistical significance of the show headcount variable in LV Hotel 2's coin-in model also lends support to empirical findings by Parsons (2003) and Sit et al. (2003). In Parsons (2003), entertainment-based promotion, such as stage shows, fashion shows and market fairs, were not very effective in increasing shoppers' expenditures. Sit et al. (2003) also found that the importance ratings of entertainment offerings within a shopping center were relatively low compared to other shopping center attributes. In their study, patrons who placed high importance on entertainment within a shopping center were mostly single teenage males with low annual income. People who attended the LV Hotel 2's show were not avid slot players, as were the respondent teenagers uninterested in shopping in Sit et al. (2003).

The results of LV Hotel 2's Model 1 (coin-in model) also appear to be consistent with results made by Walters and MacKenzie (1988) and Walters and Rinne (1986). The findings of LV Hotel 2's Model 1 failed to support conventional theory relating to a show's ability to generate casino revenues. This mirrors findings from both Walters and MacKenzie (1988) and Walters and Rinne (1986) whose studies also failed to show support for the conventional theory in the retail industry that loss leaders are effective in increasing store traffic and sales. Lucas and Brewer (2001) also produced similar results. They found no significant relationship between slot business volume and food covers. Along with shows, low food prices have been commonly employed in the casino industry to draw or retain casino customers.

Although the show headcount variable had no significant relationship to coin-in, this does not necessarily mean that LV Hotel 2 should not offer the show. Roehl (1996) mentioned that it might be worth offering amenities, as long as the amenities are profitable on their own, or if they are critical enough to attract visitors who might not otherwise visit the property. Additionally, the showroom could add intangible value by enhancing the image of the property as a full-service resort, creating the excitement of the gaming environment, or functioning as a site finder. Hence, further investigation to explain the contribution of a showroom to LV Hotel 2's bottom line is necessary. If the show produces substantial profits directly from ticket sales, the presence of a showroom within the casino as a profit center, could be supported, despite the showroom's small contribution to overall gaming volumes. The findings also emphasize the importance of careful selection, investment and management of entertainment.

With respect to Model 2 (cash drop model) of LV Hotel 2, the model results were inconsistent with other models tested in this study and those of previous researchers. The model demonstrated an R^2 of .70, and the show headcount variable was statistically significant. However, none of the temporal indicators representing days of the week, except the Tuesday indicator, were significant in the model. Moreover, the Sunday variable did not have the expected sign. In contrast, other models tested in this study indicated that weekend variables representing Fridays, Saturdays and Sundays were positively related to gaming volume. Previous studies (i.e. Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003) also suggested that there was a high demand for casino gaming during weekends. Lucas and Santos (2003) advanced the theory that an increase in leisure time induces more gaming volumes. Given the

inconsistency between Model 2's results and previous findings, caution is necessary in making statistical inference regarding Model 2's results. Model 2 may not be a valid model.

Additionally, the appropriateness of cash drop as table games' performance measure is questionable. As previously discussed, there are a number of factors that could affect the calculation of drop, such as foreign chip policy, cash policy, false drop, marketing programs, and the use of rim sheets. Despite this study's use of cash drop excluding credit play, these factors can still impact the calculation of cash drop. Furthermore, Lucas and Santos (2003) questioned the representation of drop as a performance measure and pointed out the problems associated with the drop measure in correlation-based analysis.

In fact, a discussion with an analyst from LV Hotel 2 revealed that the property's cash drop included foreign chips from other casinos and promotional chips offered to high rollers. The inclusion of these chips in the drop box might have distorted the degree to which the cash drop data accurately and precisely represent the business volumes of table games. This, in turn, might have generated model results inconsistent with previous findings. If promotional chips were excluded from cash drop, Model 2 might have provided different results. This is supported by the test results of LV Hotel 1's Model 2, which also employed the cash drop data. The findings of LV Hotel 1's cash drop model were consistent with the conclusions drawn by previous studies. In fact, LV Hotel 1 does not target high rollers. Hence, LV Hotel 1's cash drop is far less likely to include promotional chips or marketing incentives tailored to high rollers. As its cash drop is less likely to be influenced by the value of promotional/marketing incentives,

disproportionate drop contributions were less likely to occur. Additionally, data collection during different time periods by each subject property could possibly explain the inconsistent findings. Further research is necessary to compare findings between studies and to evaluate the validity of findings.

Other Model Effects

Regression analyses revealed that variables reflecting holidays had, in general, substantial effects on gaming volumes. Consistent with the results presented by Lucas (2004) and Lucas and Santos (2003), some holiday variables exercised strong effects on daily coin-in and cash drop. The magnitude of the regression coefficients and *t*-statistics of these variables were large, indicating the impact of seasonality on gaming volumes. Several marketing studies (Walters & MacKenzie, 1988; Walters & Rinne, 1986) also found the significant effects of holidays on sales volume. Walters and MacKenzie (1988) found that increases in store traffic during holiday periods positively affected sales of in-store promoted items at one grocery store. Walters and Rinne (1986) also demonstrated a strong effect of the holiday variable on store traffic and sales of non-promoted items, in their examination of the impact of price promotions on overall store performance.

In addition to the holiday variables, the temporal variables representing Fridays, Saturdays and Sundays, had positive model effects in this study. The magnitude of these variables' regression coefficients was substantial. These findings were in line with previous findings. Significant and positive model effects associated with the weekend variables were previously observed (Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas & Santos, 2003). The result of this study supports the theory advanced by Lucas and Santos (2003) that the presence of, or increase in, leisure time

could lead to increases in gaming volumes. It appears that high gaming volume during weekend and holiday periods is a systematic phenomenon. In fact, casinos schedule additional dealers and service staff in anticipation of holiday and weekend business levels.

With respect to the special event variable in LV Hotel 2's coin-in model, its regression coefficient was not statistically significant, and the *t*-test value was quite small. This is contrary to Lucas's (2003) result, which found a significant and positive indirect effect of special events on drop. However, Lucas (2003) examined special events that were held at a neighboring property's showroom.

Observations that demonstrated noticeable peaks in the residual graphs were incorporated in models as binary variables (i.e., 01-May). These variables were to correct for the observations with unusually high gaming volumes. The inclusion of the binary variables in models improved the explanatory power of the models. They were also all statistically significant. Given the presence of statistical significance, the observed deviations of coin-in/cash drop would not be due to random variation alone. In fact, discussions with an LV Hotel 2's analyst revealed that the property had casino events (i.e., slot tournaments) for February 12, February 16, April 28, April 29, April 30, and May 1. It is possible that players invited to the events played more than normal, thereby generating higher gaming volume. This could be a possible explanation for the statistical significance of the variables, such as 12-Feb, 16-Feb, 28-April, 29-April, 30-April, and 1-May. In fact, Lucas and Brewer (2001) found that slot tournaments produced a significant and positive effect on gaming volumes. In comparison, other days with unusually high gaming volumes had no such information available.

Finally, regression analysis with ARMA errors indicated a strong explanatory power in the error terms. As previously discussed, errors were correlated due to time series data used for regression modeling in this study. This was corrected by employing ARMA errors in a regression. The removal of autocorrelation via ARMA errors significantly increased R^2. For instance, in the absence of the error terms, Model 1 of LV Hotel 1 had a R^2 of .82. However, the inclusion of the error terms in the regression produced a R^2 of .87. This indicates that there might be other missing variables that are being proxied by the error terms. Hence, further research is necessary to identify the unknown factors that were captured by the error terms.

Implications of Effect Magnitude

Further analyses were conducted to estimate the incremental gaming revenue per show attendee. Lucas and Santos (2003) explained the procedures to estimate the indirect contribution of food covers to slot business volume, in terms of incremental revenue or win. On the basis of the procedures introduced by them, this study also quantified the incremental revenue or win per show attendee. Lucas and Santos (2003) used a weighted average floor par to produce an accurate estimate of incremental slot win, in which each machine game's percentage of total coin-in served as the weighting mechanism. However, information relevant to the weighted average floor par was not available for calculation in the current study.

A review of the gaming revenue document reported by Nevada Gaming Control Board (NGCB) revealed average win percents of 6.48% for slots and 12.28% for table games, in 2005, for the 24 Las Vegas Strip properties with revenues of $72,000,000 and

over (NGCB, 2005b). The win percent for slots is identical with the actual hold for slots. Slot hold is the percentage of the total amount wagered that is retained or won by the slot machine (Kilby, Fox, & Lucas, 2004). The hold serves as an indicator of game performance. It can be easily found in various gaming reports. Table game hold percentages represent the win divided by drop (Kilby et al., 2004). The NGCB's 2005 gaming revenue report presents the win percent for table games. This number is adjusted to compensate for the effects of credit play. Due to the unavailability of the table game hold percentage, the table game annual win percent of 12.28% was used as a proxy. The slot win percent of 6.48% was used as a proxy for the average floor par of slots to conduct the effect magnitude analysis.

To assess the net effect of shows on gaming revenue per show attendee, the regression coefficients of each show headcount variable were multiplied by the win percent. The calculation was repeated for a regression coefficient of the show headcount variable in each model. As a result, Model 1 of LV Hotel 1 produced an estimated $7.84 of incremental slot revenue for every one-unit increase in the show headcount variable. In Model 2, cash drop increased by an estimated $3.44 per show attendee. For LV Hotel 2, the estimated incremental slot win per show attendee was $2.85, and cash drop increased by an estimated $16.47 per show attendee. In general, the economic significance of the incremental wins is not substantial, despite the positive linear correlation between show headcounts and gaming volumes in some models. The relatively small incremental cash drop of LV Hotel 1, in particular, indicates that its entertainment does not have a material effect on table game profits.

These numbers represent the average daily theoretical slot/table game revenue of a show headcount. By multiplying the daily show headcounts by the average daily theoretical slot/table game revenue per show attendee, the daily slot/table game revenue produced by the property's showroom could be estimated. With this information, casino executives at each of the subject properties could determine whether the incremental gaming revenues are sufficient enough to cover the showroom's operating costs. This is of significant importance in the event that showroom losses occur. However, these numbers would be lower if the costs associated with gaming taxes and the daily operation of a casino, including labor and other expenses, were estimated and subtracted from the revenue. With regard to the immaterial magnitude of the incremental win per attendee, these findings are in line with those of the loss-leader promotion literature in which most loss leaders were found to have no significant impact on store profits.

Managerial Implications

The effectiveness of entertainment in attracting casino play varied by property. The regression coefficients of the show headcount variables in all models, except the one in Model 1 of LV Hotel 2, were positive and statistically significant. Given the results of models, customers attending LV Hotel 1's show appear to be more gaming-oriented than those attending LV Hotel 2's show. If LV Hotel 1's showroom is at least marginally profitable, this indicates that entertainment does not have to be a loss leader to have positive indirect effects on gaming volume. However, the findings of LV Hotel 2's Model 1 suggest that entertainment does not necessarily have to be a complement to gaming. Additionally, the amount of incremental gaming revenue generated by each

entertainment-driven player was not substantial. The following sections discuss the managerial implications related to the model results.

Is a Showroom a Critical Element?

The findings of LV Hotel 2's Model 1 failed to support the conventional theory that entertainment is a complement to gaming. Given the absence of statistical significance, its showroom appears to attract people whose primary motivation is entertainment rather than gambling. A show may not be the important choice factor for the players of LV Hotel 2. However, it could be the primary reason or motivation of casino visits for non-gamblers who are more interested in entertainment than in gaming. Given the findings, casino executives at LV Hotel 2 may want to consider whether its showroom is a must-have amenity. To justify the presence of a showroom within a casino, it should be a profitable operation, contributing to the company's bottom line. Its direct contribution should be substantial, given that there are other competing sources of revenue.

An interview with an executive at LV Hotel 2 revealed that its showroom is a profit center, generating a substantial amount of money via ticket sales. In fact, the occupancy of its showroom was 88% for the eight-month data collection period, despite its relatively high-ticket prices compared to other show options in town. Based on the analytical findings, along with the above-mentioned interview, it could be concluded that show goers of LV Hotel 2 are not necessarily gamblers, and the showroom is not necessarily a complement to casino gaming.

In fact, LV Hotel 2 has invested a substantial amount of money in expanding and remodeling its facilities in order to position itself as a destination resort offering full resort services. LV Hotel 2 currently features diverse non-gaming amenities and services,

including several hotel towers, a selection of restaurants, a full spa, a nightclub and a convention facility. Given the full range of services and amenities within the property, it appears that LV Hotel 2 attracts guests who are not necessarily gamblers, but wish to enjoy a resort experience, including entertainment, dining out and shopping. Although this study did not examine the impact of show headcounts on non-gaming revenues, show attendees' spending on non-gaming activities could be considerable. In fact, the company's financial report stated that the increase in net revenues for recent years might be attributed to the creation of additional spending opportunities via new restaurants, bars and other amenities.

Given LV Hotel 2's effort to transform itself into a destination resort, its showroom may be a must-have amenity, not as a traffic builder for the casino, but as a component of a full-service resort. The presence of a showroom may also enhance the overall image of the property as a full-service resort. As casinos broaden their leisure and entertainment options, more customers view the casino as a place for different kinds of leisure activities. Hence, customers are becoming more sensitive to the entertainment options, as well as amenity services, when selecting a casino. Additionally, as people become more time-pressured, casino visitors may want to economize on the time costs of casino visitation by utilizing different amenities or services within a casino. They are demanding more options within a casino. Consequently, gaming could be just one of many leisure activities for non-gaming-oriented people. Their gaming time and casino spending may be less than average. However, their total spending per visit may increase mainly because they patronage multiple outlets within a casino. This seems plausible given the

fact that non-gaming departments in many casinos generate close to more than half of total revenues.

The results of LV Hotel 2's Model 1 may reflect a paradigm shift, whereby customers have come to expect more sophisticated and diverse services. Gambling alone may no longer guarantee a casino's success or differentiate it from the competition. A selection of ancillary services and amenities could provide people with more reasons to select casinos, thereby increasing their visitation frequency and broadening the existing customer base. By increasing the amount that visitors spend per trip, the revenue potential of the current customer base is enhanced. In fact, many casinos are transforming themselves into self-contained mixed-use facilities. For example, the Boyd Gaming Corporation plans to establish a multi-faceted resort complex on the Las Vegas Strip by offering venues for casino gaming, dining, shopping, convention, and entertainment (Boyd Gaming, 2006). With respect to entertainment, the company will build a 4,000-seat theater to house major concerts or production shows and a 1,500-seat theater to accommodate smaller-scale shows (Boyd Gaming, 2006). It is possible that casinos offer a selection of ancillary services or amenities to remain on par with their competitors. However, employing entertainment in response to competitors' actions may not the best decision in terms of meeting customer needs and optimizing financial returns.

In offering amenity services and leisure activities, the extent to which potential customer segments are substantial and/or profitable enough to maintain those establishments should be considered. A particular Broadway show may appeal to a certain group of people or locals and attract customers that may return to see the show again. However, the size of the customer group may be insufficient to fill the showroom.

Put simply, the market that the show serves is not large enough or profitable enough to support a Las Vegas showroom operation. For instance, the 1,200-seat theater built to accommodate the "Avenue Q" show at Wynn Las Vegas barely managed a 50% occupancy rate (Fink & Simpson, 2006). Even though the show was profitable, it produced less than optimal returns due to the showroom's underutilization. Consequently, it is difficult to optimize any spillover effects on gaming if the show is not meeting its full occupancy potential. In fact, Wynn Resorts decided to replace "Avenue Q" with another Broadway-style show.

According to industry professionals and critics, the possible reasons that "Avenue Q" suffered low attendance are that (1) the show was too sophisticated or esoteric for Las Vegas audiences (2) it appealed to a narrow niche market and (3) it did not have a spectacle to grab people's attention (Fink & Simpson, 2006). Additionally, most Broadway shows were not originally designed for a big venue such as a 1,000+- seat Las Vegas showroom.

Las Vegas shows and Broadway shows have different profit goals. A sell-out show is a big concern for many Broadway show producers, while the incremental gaming revenues generated by show goers are more of concern for many casino operators. Consequently, Las Vegas shows are offered to appeal to a broad audience, whereas Broadway shows are generally designed to appeal to a specific target audience. Additionally, Las Vegas show audiences may not share the same characteristics of Broadway show audiences. Hence, the success of a show in Broadway may not translate into a successful Las Vegas production. This suggests that casino management must carefully determine the appropriate theater seating capacity and the number of

performances per week, based on segment size and profit potential. 50% occupancy of the 1,200-seat theater could equal 100% occupancy for a Broadway theater. Hence, casino management should be careful in deciding the showroom's seating capacity to ensure the showroom's maximum utilization and direct profitability. Analysis of casino space allocation would be helpful in optimizing the effective use of casino space. With respect to performance frequency, one show per night instead of two performances a night may help the show's profitability. Additionally, a Las Vegas version of the Broadway show that is adapted for Las Vegas audiences may be necessary, given the potential differences in audience profiles between Las Vegas and Broadway.

With respect to LV Hotel 1, show patronage was positively correlated to coin-in and cash drop, thus supporting conventional theory. Additionally, the incremental gaming win per show attendee was in the black in both the coin-in and cash drop models. Despite the positive indirect effect of the showroom on gaming volume, casino executives should consider whether the extra gaming revenue generated by show attendees is meaningful. In particular, for casinos experiencing operational losses for its showroom operation, incremental increases in gaming revenue should be sufficient, at least, to offset the loss. If not, show ticket prices should be reviewed, as well as other amenities or leisure activities that may exhibit stronger externalities that may spill over into the casino. Simply terminating a show's run or encouraging visitors to spend more money on gaming may be more profitable.

However, as previously noted, entertainment could be an integral aspect of a casino's strategy to position itself as a multi-faceted resort, even though it may not generate sufficient profits. Additionally, entertainment could positively contribute to the

company's overall profits via its spillover effects on non-gaming areas (i.e., food), although it may not maximize slot/table game revenues. Entertainment tends to also add excitement to the casino. Hence, further examination is necessary to understand the role of entertainment and to determine whether entertainment is an important factor in casino patronage.

Strategies for Managing a Show More Effectively

Given the absence of statistical significance of the show headcount variable in LV Hotel 2's coin-in model, its showroom appeared to mainly attract non-gamblers. Consequently, casino executives of LV Hotel 2 may want to review the current strategies for managing its showroom. The theme or ticket prices of the current show may not appeal to the casino's target clientele. It could be possible that current show promotion strategies are not effective in attracting players, but are instead effective in attracting entertainment-oriented people. Investigating the effectiveness of current marketing channels, such as radio, TV, billboard and print ad, in reaching target clientele and influencing patron choice could provide casino management with valuable information to improve their marketing and promotional efforts. Information relevant to promotion/marketing will also help casino executives make better decisions regarding their current showroom operations.

With respect to pricing, the ticket prices for the show at LV Hotel 2 were higher than those for the show at LV Hotel 1. Relatively expensive pricing for LV Hotel 2's show could be one of reasons that its show couldn't draw sufficient number of casino players. In other words, gamblers may want to spend more money in gaming, rather than on a show, in particular when the show is expensive.

The findings of LV Hotel 2's coin-in model require casino executives to reconsider their showroom-related low-pricing strategy, if they are indeed committed to that strategy. Blind application of conventional theory via low show prices should be cautioned. Inexpensive show ticket prices could only attract price-conscious people with no gaming intentions, thereby equating into an opportunity cost. Hence, casino executives may want to revisit their pricing strategy, if show prices were set using the showroom's indirect effect on gaming volumes as a basis. They may want to raise ticket prices based on the entertainment quality, demand or its operating costs. However, price increases should be accompanied by overall entertainment quality improvement and more benefits to justify higher prices. Further, after careful ticket price examination, if management decides that an increase is merited, any increases should reflect what the market would bear.

With respect to show promotion, each property may want to gear its efforts toward a particular customer segment. In the models of LV Hotel 1, the estimated incremental slot win per show attendee was greater than the estimated incremental table games' win. However, LV Hotel 2's show had more significant effects on table games' revenue than on slot revenue. Different findings between LV Hotel 1 and LV Hotel 2 may be partially due to differences in promotional activities and showroom operational strategies. It may simply be show specific. Additionally, different clientele profiles that each showroom serves might be the reason. For LV Hotel 1, it seems to be more profitable to attract slot players rather than table game players based on the comparison of effect magnitude. Hence, LV Hotel 1 may want to focus on attracting more slot players to its showroom. Conversely, LV Hotel 2 may want to attract more table game players to the casino than

slot players, given the positive relationship between the show headcount and cash drop variables.

However, given the limited profit margin for table games, a table game player's potential gaming activity should be carefully reviewed against the cost of offering complimentary entertainment. Table games are labor intensive, and consequently the associated labor costs are traditionally high. Additionally, the table game department's share of total revenues has decreased over the past several years. Gaming reports from the NGCB indicate that table game revenues for the Clark County casinos with gaming revenues of $1,000,000 and over dropped by approximately 7% from 37.2% in fiscal-year-end 1995 (NGCB, 1995) to 30.3% in fiscal-year-end 2005 (NGCB, 2005a). Conversely, revenues from coin operated devices increased from 59.0% in 1995 (NGCB, 1995) to 66.1% in 2005 (NGCB, 2005a). For local casinos, which serve repeat customers and/or day-trippers, slots' large and increasing share of business is more obvious. Hence, the appropriate value of a complimentary show offer as a perk should be carefully determined based on a casino's potential earning from an individual player's gaming habits.

The careful employment of complimentary show tickets is necessary to maximize cash flows from a show. For decades, many casino operators have attempted to lure people with inexpensive or free shows, in the belief that profits lost from offering low show prices could be offset by casino games' high profit margins. However, complimentary show tickets designed to increase casino revenue could lessen the opportunity to sell the tickets at retail, thereby producing lost profits. Given the small

amount of incremental gaming revenue per show attendee in this study, selling a show ticket at retail may generate greater profits.

Additionally, casino management may want to expand its show's customer base by attracting more conventioneers to the showroom. In particular, LV Hotel 2 serves various conventions and meetings, filling hotel rooms and creating business for non-gaming venues during midweek. Given the absence of a statistical relationship between show headcounts and coin-in, LV Hotel 2 may want to attempt to leverage its convention traffic. Making entertainment part of convention marketing or promotion strategy could ultimately capture a greater share of conventioneers' travel budget and bring in additional profits for the showroom. In fact, in 2003, Las Vegas ranked as the nation's top convention destination that hosted the biggest conventions/trade shows and leased the largest total square footage (Jones, 2004). A constant and massive influx of conventioneers or non-gamblers during weekdays will allow the casino to address showroom utilization issues and to justify future extensive entertainment venue development.

Finally, given the presence of a positive relationship between show headcounts and gaming volumes, casino executives of LV Hotel 1 may want to examine changes in gaming volumes by varying the show schedule. For example, casinos may be able to create increased gaming activity by having a show perform twice a day during slow midweek/non-holiday periods, instead of during peak weekend periods. In general, casinos have a high demand for gaming during weekend/holiday periods. LV Hotel 1 may already be utilizing the current capacity to its maximum during weekend/holiday periods. If so, shows on an already busy weekend night may not have a significant

contribution to gaming volume. More shows during midweek, however, may be able to draw additional traffic to the casino, thereby allowing the casino to leverage this traffic. Further examinations of daily, weekly and seasonal fluctuations in gaming volumes would provide valuable insight in determining optimal show performance frequency.

Modification of the Current Show

If casino executives do not consider the estimates of incremental wins substantial, they may want to consider modifying or replacing the casino's current show. Introducing changes to the current show may elicit additional casino visits among previous show attendees. The overuse of any particular show could lead to a loss of appeal as the uniqueness wanes over the years. In fact, the show at LV Hotel 1 has been playing for several years. According to the Las Vegas Convention and Visitor Authority (LVCVA) survey in 2003, one of the reasons cited for not attending shows was, "seen everything already" (11%). Hence, an examination of both short-term and long-term effects of a show on gaming volumes would be helpful in gaining a better understanding of the useful life of that show.

Additionally, casino operators need to reconsider whether its current show is appropriate for their target market. If not, further examination on which kinds of shows attract the preferred target segment is necessary because different shows draw different clientele. For instance, the number of international guests and families attending David Copperfield's magic show is greater than those attending Howie Mandel's show (F. Pelletieri, personal communication, July 12, 2005). One of key reasons for the early closing of "Avenue Q" was the show's lack of broad audience appeal. Because the show was abundant with irony and American expressions, it was not suitable for the property's

major customer segment, the Japanese tourist (Fink & Simpson, 2006). Given the obvious language barriers, a visual spectacle may appeal to a broader range of customers, including its primary market segment consisting of international tourists. This case emphasizes the importance of examining customer mix and potential demand for entertainment before implementation.

With respect to a show's style, Steve Gabriel, Vice President of The Booking Group, mentioned that an adult-oriented musical, such as "Rent" and "Chicago," would be a better fit for casinos in Atlantic City than a family-oriented musical, given that children are not desired customers for casinos. In fact, Treasure Island Hotel Casino in Las Vegas has changed its name to TI and now offers an outdoor show performed by scantily dressed women. This property, which previously had projected an image of being a family-oriented property, replaced its pirate show with this adult-oriented show in order to attract different market segments.

Casino management may want to explore the option of introducing a new show. For instance, "KA" at the MGM Grand has been known as the first show among Cirque shows to have a storyline. This fact could help the show distinguish itself from other competitive Cirque productions and encourage attendees to see the show again to better understand the story. Another type of show, such as a comedy, could be considered as an alternative, given the increasing popularity of comedy shows with Las Vegas visitors. About 13% of visitors attending shows during their Las Vegas trip went to a comedy show, indicating a significant increase, compared to 8% in 1999 to 9% in 2001 (LVCVA, 2003). Compared to comedy shows, big-name headliners had no significant changes in attendance (LVCVA, 2003).

Management may also want to consider developing cost-effective shows, such as lounge acts, featuring local band performances on the casino floor. In particular, a lounge act will cost less than a production show, because it does not require a custom-built theater or a showroom solely devoted to the production/Broadway-style show. Such shows on the casino floor could also achieve higher visibility than those in showrooms and add excitement to the casino floor. In fact, the LVCVA survey (2003) reported a significant increase of visitors attending lounge acts, including free of charge performances, for the past three years (49% in 2001, 69% in 2002 and 83% in 2003), whereas it noted a continued decline of visitors attending production shows (65% in 2001, 57% in 2002 and 47% in 2003). However, these results could be due to an increase in the number of free shows offered by casinos and the subsequent increased patron exposure to them. Additionally, Roehl (1996) suggested that lounge show attendance was not significantly associated with higher gaming expenditures.

Before offering a show, it is recommended that casino marketers consider the psychographics and demographics of their target markets. Understanding the diverse lifestyles, beliefs, opinions and interests of their casino clientele would be helpful in identifying the show best suited to the casino's target market. Demographics, such as disposable income, age, gender, and ethnicity could also provide information about the target market's potential buying power and spending patterns. The subject casinos could analyze customer information in their databases to better understand the characteristics of target segments, including demographic profile, frequency and length of casino visits, spending per visit, and non-gaming venues patronized during casino visits. Interviewing or surveying casino patrons regarding their perceptions of the current show, preferences

for entertainment and attitudes toward entertainment, could also be helpful in understanding their entertainment-related needs and expectations.

Furthermore, competitive analysis should be conducted to differentiate entertainment offerings from those offered by competitors. The market may be already saturated with similar kinds of entertainment. Offering similar entertainment at low prices or providing preemptive entertainment may help to keep competitors off balance. Finally, entertainment selections should fit the property's profile.

Alternate Uses of Available Casino Space

Based on the findings of this study, casino executives at the subject properties may want to determine whether their showrooms are the best use of casino floor space in terms of maximizing profits. The incremental gaming win per show attendee calculated in this study may not be very impressive for the subject casino executives. Although the numbers expressing the direct contribution of a showroom to each subject property's bottom line were not available for this study, casino executives may want to consider replacing the showroom with other types of services or amenities, particularly when the direct contribution is not substantial. Successful operations of other amenities, services or casino games could be more lucrative.

As a showroom alternative, casino executives may want to consider offering more slot machines. Slot machines are the highest profit generator per square foot among casino games. A conservative estimation of the slot department's profit margin is 60% to 70% (Kilby et al., 2004). This is substantially greater than other departments. For example, given the substantially lower profit margin in table games, a dollar's worth of gross slot play is far more profitable (Kilby et al., 2004). Therefore, increased slot

capacity on the casino floor could satisfy high demand for machine games during peak periods and thus bring in higher profits than a showroom.

The physical space and resources allocated to a show may also be better suited for other types of non-gaming amenities. The LVCVA survey (2003) indicated that the number of visitors, who reported that they were not interested in a show, increased significantly over the years (18% in 2001, 23% in 2002 and 30% in 2003). Additionally, only 5% of the visitors to Las Vegas said that their primary purpose was to gamble (LVCVA, 2003). Hence, diversification into other non-gaming areas could create additional profit streams. Retail shops that generate increased foot traffic could be viable alternates, given their rapid growth and success within casinos in recent years. Retail shops within a casino could attract groups or couples, including shoppers and players. Participating casinos may be able to capitalize on an increase in spending per visit trend. For instance, the Forum Shops at Caesar's Palace in Las Vegas, which completed a recent expansion of its mall, generated the highest per-square-foot sales of all shopping malls in the U.S. (Casino Connection, 2004).

Determining a new amenity or service type requires careful assessment of its direct and indirect effects on the company's bottom line. If the establishment's purpose is to complement gaming, the new facility should enhance the casino's appeal with gaming rather than detract players from the casino floor, or hinder their gaming. Surveying or interviewing only the casino's profitable market segment as to the benefits or motives customers seek when visiting a casino can be helpful in deciding which type of amenity is desirable for its target market. Hence, casino operators could develop services or amenities that provide the benefits customers seek and deliver value to customers.

Additionally, further assessments of potential market demand for selected amenities, average spending per visit and visitation frequency are necessary to ensure sufficient returns on investment.

In allocating casino space, cost-benefit analysis could be helpful in estimating the revenue contribution of each amenity or service per square foot. An examination of variations in gaming revenue for additional casino space allocated to the establishment could reveal the point where the costs associated with the additional floor space exceed the estimated total revenue. Hence, developing a model to manipulate floor space and estimating its effects or consequences would help casino executives plan a configuration of amenities that optimizes the use of casino space and the profits generated by that space. Once a new amenity is selected, the amenity's projected ability to generate revenues should be compared against the revenues from previous space usages.

Other

Show contract structure should be given special attention. Before deciding on what type of show-related deal to engage in, casino executives should understand the impact that a show will have on the company's bottom line to ensure a positive return. Especially in negotiating *four-wall* contracts, in which casinos do not share ticket sales, casino executives should consider the ability of a show to draw traffic to table games and slot machines. In the case of LV Hotel 2's show, the profitability and sustainability of the show over a period of time should be more of a concern, given the absence of a significant relationship between the show headcount and coin-in variables. Its showroom should serve as a profit center and produce substantial revenues directly from ticket sales. In communicating the structure of a *two-wall* contract, casino executives should estimate

both indirect and direct effects of a show in order to appropriately claim the casino's share of show revenue.

When a casino leases out space to an outside show production, instead of employing an in-house production, a stable stream of revenues from rents could be generated. In order to select an appropriate show and to ask for adequate lease payments, an analysis of how the show will impact gaming revenues is necessary. Additionally, showroom-type entertainment should be carefully selected to appeal to a specific market segment or a broader segment. It should also stand out from competitive shows, given other competitive entertainment providers. As more casinos offer shows, customers have more choices. Just because an outside show company has a popular show and in-depth operating experience does not mean its show will attract the right clientele.

Finally, sales of show-related merchandise could help a showroom maximize its profits. CDs, props and custom clothing are examples of items sold as an adjunct to a show. In fact, merchandizing accounts for about 20% of revenue associated with Cirque shows (Palmeri, 2004b). Beverage sales could also contribute to a showroom's profitability. Self-serve bars could save labor costs associated with beverage services, compared to tableside drink services by showroom servers. As in most movie theaters, seats with cup holders would facilitate the self-service sale of drinks.

Summary of Implications

In general, the results of this study support conventional theory with regard to the complementary effect of entertainment on gaming volume. However, the findings, with regard to the immaterial magnitude of the incremental win per attendee, suggest that show goers are not necessarily avid gamblers. This finding emphasizes that casino operators should give careful consideration to selection, investment, and management of entertainment, based on the main purpose of entertainment.

The models advanced in this work will help gaming executives address the managerial questions facing them in relation to entertainment offering and management. With the methodology introduced in this study, casino executives could evaluate the drawing power of entertainment and better estimate the potential cash flows driven by entertainment. This information could be helpful in pro forma modeling used in the capital budgeting decision process. Once the indirect effects of entertainment on casino profitability are better estimated, casino executives will be able to better develop strategies for managing entertainment more effectively. If no positive and significant relationship exists between entertainment patronage and gaming volume, casino executives may want to develop entertainment options that are directly profitable or find other alternatives. Based on the projected indirect contribution of entertainment, different pricing strategies could be developed. Price points could be used to produce the maximum profits or return on investment. Additionally, benefits from the use of this study could be optimized via longitudinal research efforts. Ongoing assessments of the indirect effects of entertainment on gaming volumes could help casino executives deal with strategic planning and management related to entertainment.

The models and the methods advanced in this study have the potential for broader application in other areas of the hospitality industry. This study provided an initial foundation for future research by compensating for the inability of casinos to track all players' performance at the transaction level. Hence, future research could use this study as a platform to estimate the indirect contributions of various ancillary services and amenities in addition to entertainment. Decision-makers could apply the models and the methods to other types of non-gaming offerings, such as nightclubs and shopping malls. These examinations, in turn, will help casino management (1) determine the best mix of non-gaming offerings, (2) maximize synergies created among different offerings and (3) make the best use of casino floor space and capital investment dollars.

The application of this research could easily be expanded to other industries. For instance, a retailer could examine any complementary relationship between the sales of promotional products (i.e., a loss-leader item) and the sales of a regular-price, high margin products. Finally, this study contributes to the limited literature base associated with the impact of entertainment on gaming volume by providing relevant empirical results, given that casino entertainment has received very little research attention.

Limitations

The models advanced in this study can certainly help estimate the indirect effect of entertainment on gaming volume at the individual property level. However, several limitations associated with this study remain unaddressed. First, the results of this study may not be an accurate generalization because the data was only compiled from two

properties on the Las Vegas Strip. Results could also vary depending on the measurement time periods.

Second, in regression modeling, some data relating to marketing/visitation incentives, hotel occupancy and food covers were not applicable to the current study. To account for the potential effects of these unexamined variables on gaming volume, indicator variables representing days of the week, holidays and trends were used in this study. Despite the limited number of variables tested in this study, the explanatory power of the regressions with ARMA errors was considerably high. However, incorporating omitted variables in models could still be helpful in explaining the remainder of the variance in gaming volume. It could also lead to a better understanding of the complex influences on gaming volumes, if multicollinearity problems do not emerge.

Third, limited data sets were available for this study's analysis. Hence, future research using more data over an extended time period is necessary to examine whether the findings of this study have broad applicability. Particularly, future research should attempt to obtain or develop improved performance indicators of table games' business volumes. In this study, cash drop, excluding credit play, was used. However, LV Hotel 2's cash drop included substantial amounts of promotional chips that were offered to high rollers. This condition appeared to mask the exact amounts wagered on table games without any marketing/promotional aids. Although it would be difficult to isolate the effect of promotional chips while several marketing/promotional programs are employed simultaneously, the drawing power of a show could be better estimated, if cash drop could be separated from any promotional chips or marketing incentives. To produce

more meaningful and accurate information, future research should employ indicators that can accurately represent table games' business volume.

Fourth, the subject properties examined in this study offer a small-scale show in addition to the big-scale production/Broadway-style show. The showrooms for the small-scale shows have a small seating capacity. The indirect effects of these showrooms on gaming volumes were not examined due to the unavailability of relevant data. Hence, investigating the impact of small-scale shows would enhance our understanding of the effect of entertainment on gaming volume. Finally, a causal relationship between show headcount and gaming volume could not be examined via multiple regression analysis. That is, regression analysis cannot determine whether a casino draws show traffic or a show attracts casino traffic.

Recommendations for Future Research

Despite the contribution of this study to theory development relating to casino entertainment, our understanding of the impact of casino entertainment is still limited. Further research on this topic is necessary, given the increasing importance of entertainment within a casino. Consequently, some suggestions for model development and future research were provided.

First, the findings of this study could vary by casino, showroom-operating strategies, competing or neighboring casinos' promotional activities and casino clientele characteristics. Hence, a replication study utilizing different time periods and multiple subject casinos could further expand the applicability of this research's findings.

Replication with different research methods could also be helpful in producing more generalized results, rather than the results that are specific to the method.

Second, future research could examine profitable gaming segments regarding the role of entertainment in patrons' casino choice process. Surveying or interviewing only profitable gaming customers about casino visit motivation would be helpful in understanding the importance of entertainment in casino selection. Additionally, future research could examine the importance of amenities, including entertainment, in attracting high rollers, if a participating property were to target premium play.

Third, an investigation of the causal relationship between show patronage and gaming volume, whether the casino floor draws people to a showroom or vice versa, would be meaningful to justify any investment in a show. Despite the increasing number of shows offered by casinos, the directional relationship is unknown. This fact alone easily warrants further research efforts.

Fourth, future research is needed to measure the contribution of a show to customer acquisition and retention. It is unclear whether a casino's commitment to show options attracts new customers or its current customers. It is important to distinguish whether or not a new influx of customers is being enticed to the casino. There needs to be a clear delineation between the casino's marketing efforts. If the intent is to retain existing customers or to cannibalize customers from other properties, each marketing strategy may require a different method. Information regarding the number of first-time visitors becoming repeat guests because of a show, and underlying factors contributing to this conversion, would benefit casino operators.

Fifth, hourly gaming volume variations could be compared to show headcounts. These variations could be tracked and contrasted using time intervals generated before, during and after a show. This examination will provide a better understanding of the impact of a showroom-type entertainment on gaming volume and if the variations are indeed related to actual showroom patronage.

Sixth, in addition to entertainment, it is recommended that future research examine the indirect effects of other types of non-gaming offerings, such as nightclubs and shopping malls, on gaming volumes. This is of importance as the indirect effects of diverse offerings could vary by type. As more casinos attempt to position themselves as entertainment resorts, while erasing a purely gaming destination stigma, various non-gaming options are offered to draw/retain customers. However, different amenities, entertainment options and casino games could eventually compete against each other. This is especially true, given customers' limited time allotment and disposable gambling funds. Hence, an examination of the indirect effects of different amenities and entertainment offerings on gaming volumes would help casino executives identify which have more impact on revenue. Additionally, further investigations of the indirect effects of entertainment on non-gaming revenues, such as food and beverage, would be helpful in estimating the total contribution of entertainment to a property's overall cash flows.

Additional suggestions for future research include (1) surveying people waiting in show lines to identify demographic characteristics, gaming and non-gaming behaviors and entertainment-proneness; (2) observing show traffic flow after leaving the showroom to ascertain gaming tendencies; (3) examining the slot machine and table game performance around the showroom; (4) investigating the relationship or cultural fit

between the show's projected image and the property's overall image; (5) measuring the effect of entertainment on continued patronage, extended visits and hotel occupancy; (6) examining any potential relationship between showroom size and casino size; (7) estimating the indirect effect of entertainment on untracked play and (8) investigating the differences and similarities in the nature between diverse casino games and entertainment types.

APPENDIX I

MULTIPLE REGRESSION DIAGNOSTICS

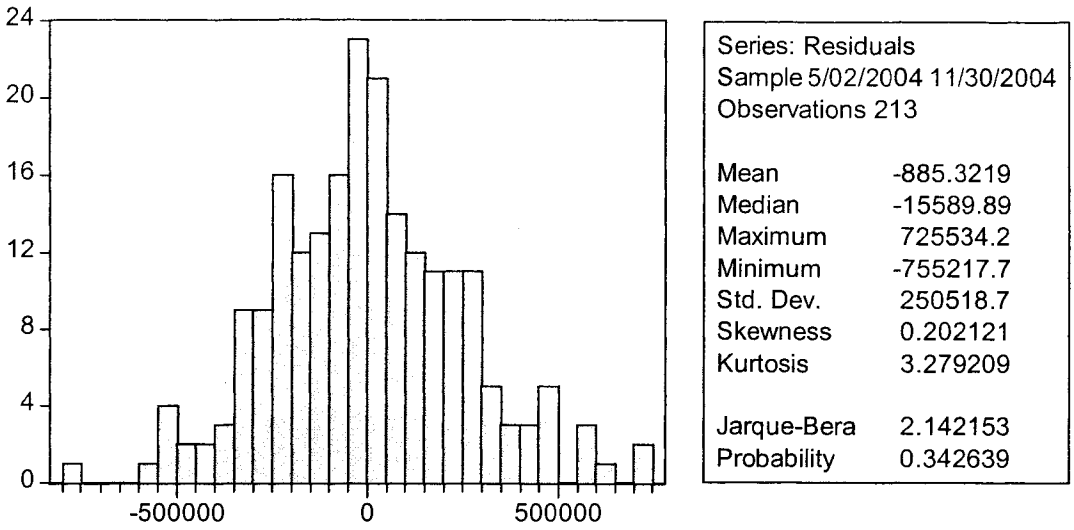


Figure 1. Histogram of residuals for LV Hotel 1 Model 1.

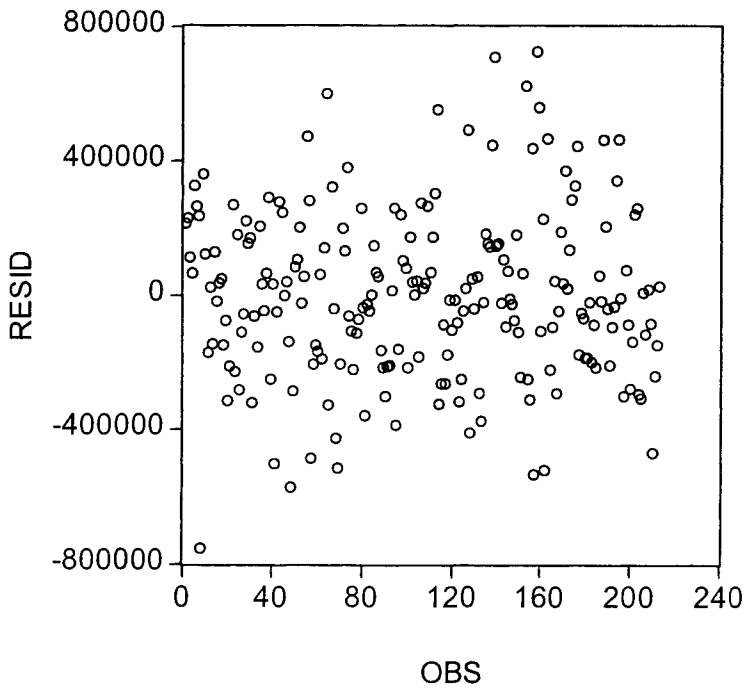


Figure 2. Residuals against case numbers for LV Hotel 1 Model 1.

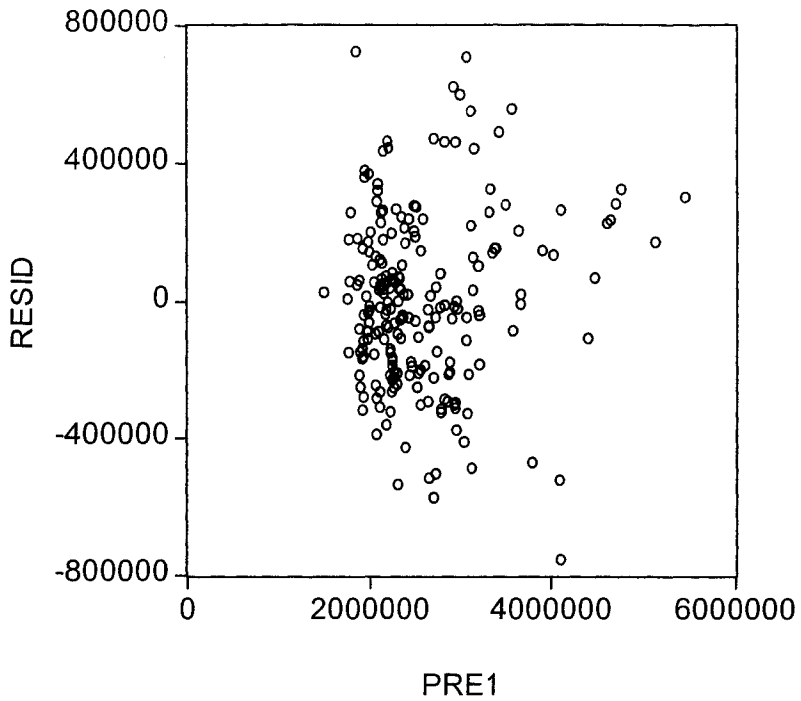


Figure 3. Residuals plotted against predicted value for LV Hotel 1 Model 1.

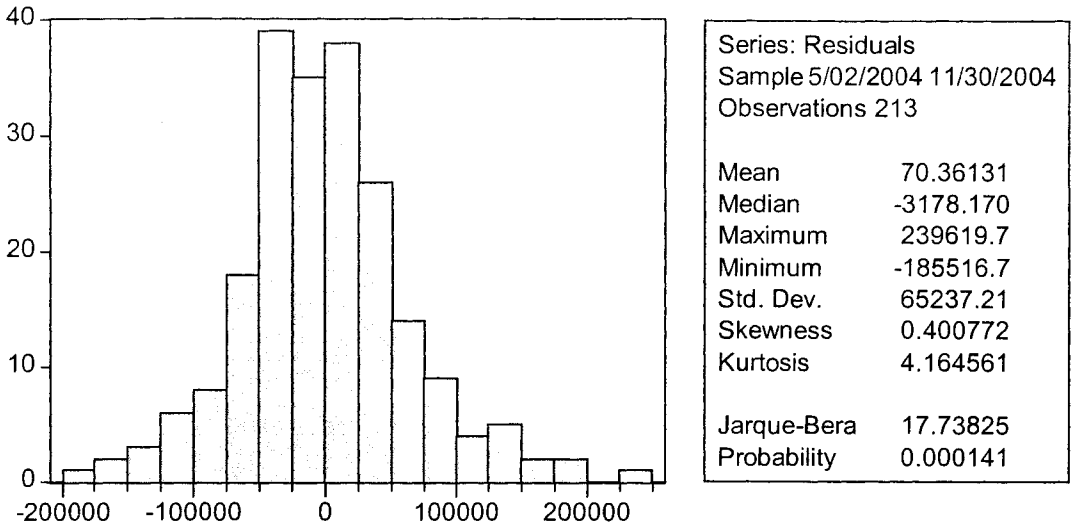


Figure 4. Histogram of residuals for LV Hotel 1 Model 2.

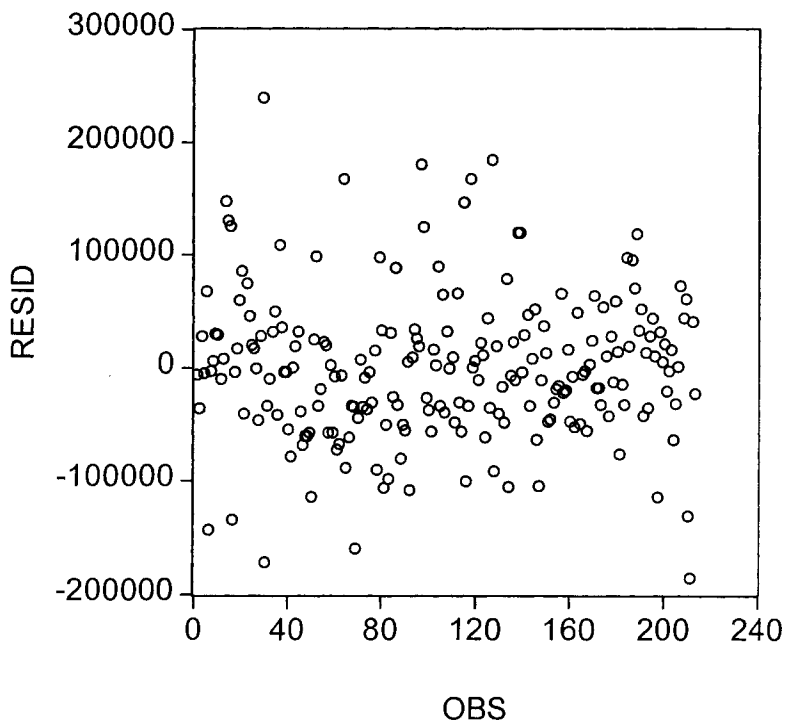


Figure 5. Residuals against case numbers for LV Hotel 1 Model 2.

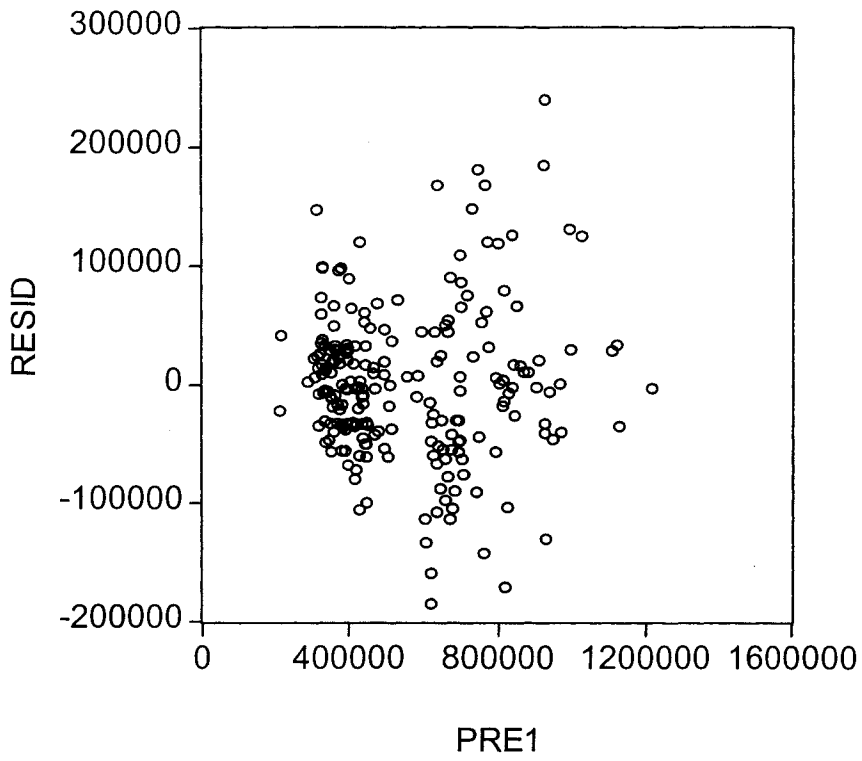


Figure 6. Residuals plotted against predicted value for LV Hotel 1 Model 1.

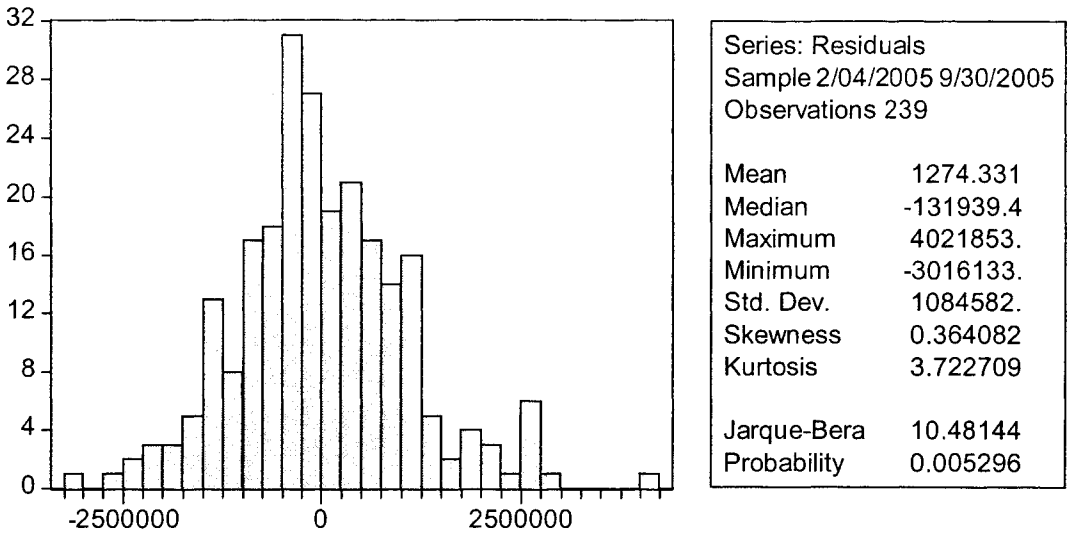


Figure 7. Histogram of residuals for LV Hotel 2 Model 1.

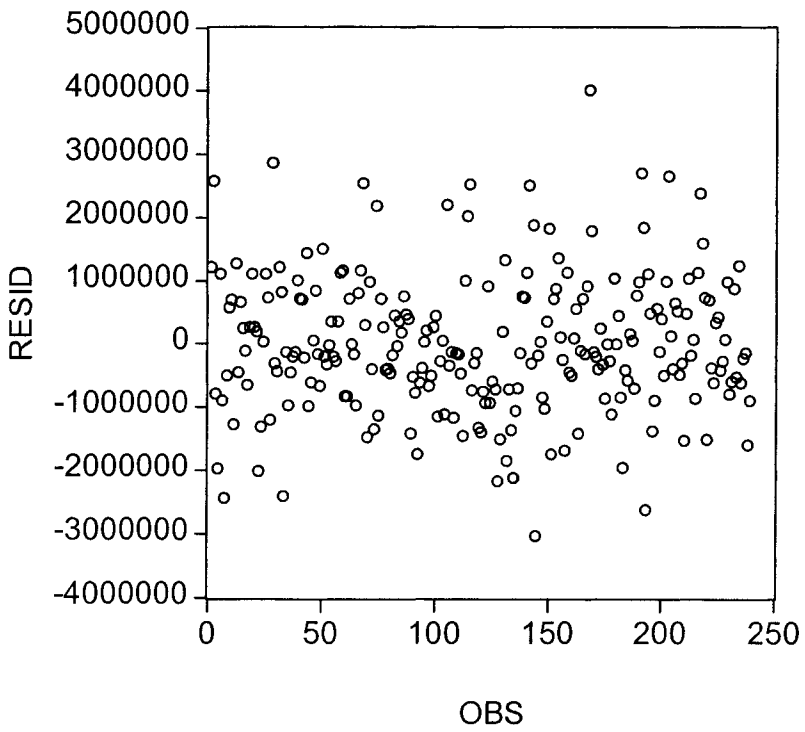


Figure 8. Residuals against case numbers for LV Hotel 2 Model 1.

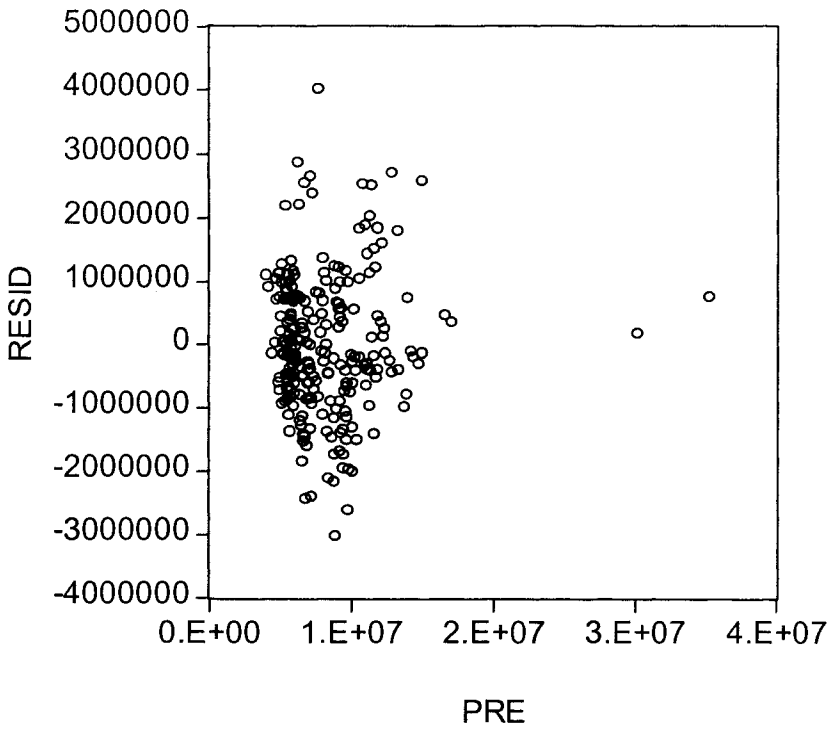


Figure 9. Residuals plotted against predicted value for LV Hotel 2 Model 1.

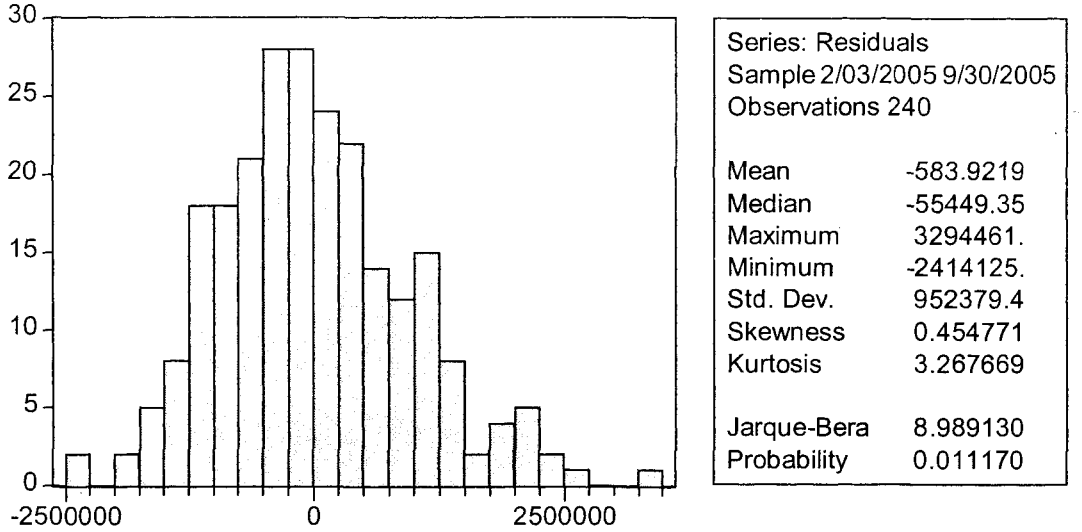


Figure 10. Histogram of residuals for LV Hotel 2 Model 2.

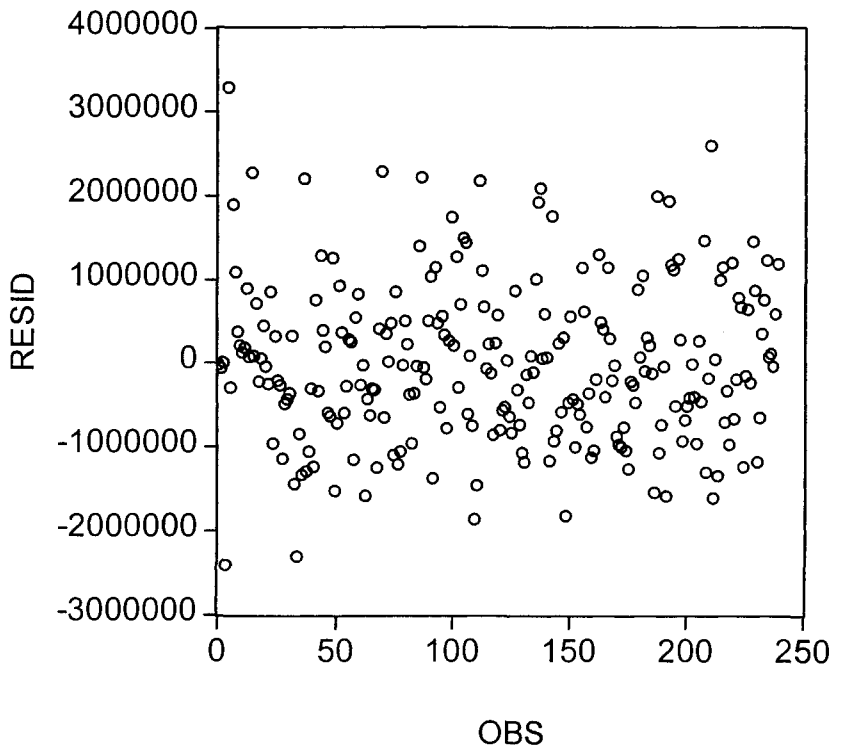


Figure 11. Residuals against case numbers for LV Hotel 2 Model 2.

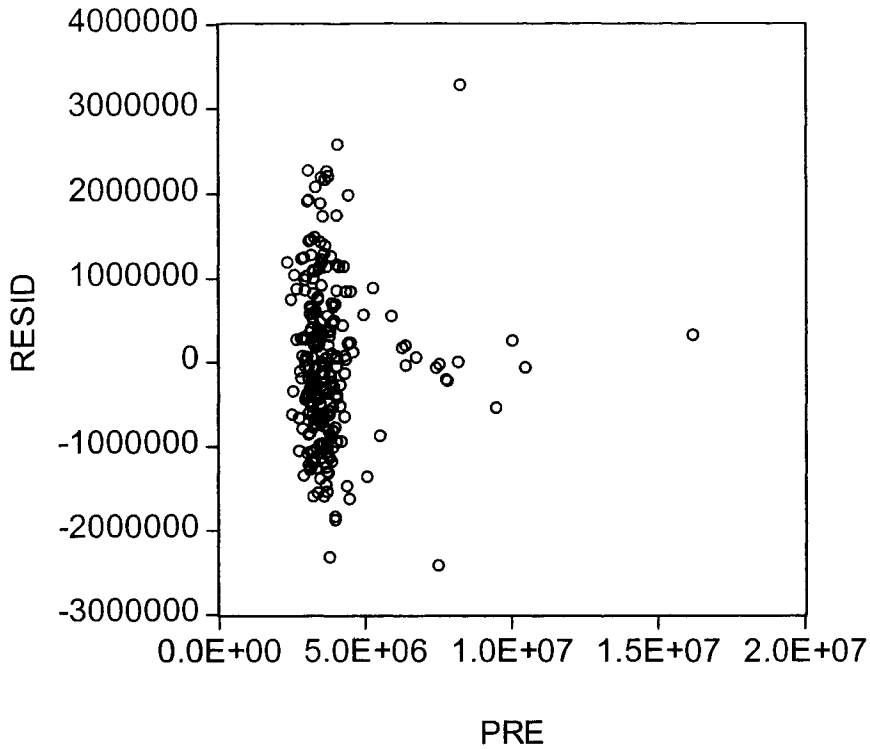


Figure 12. Residuals plotted against predicted value for LV Hotel 2 Model 2.

REFERENCES

Adams, B. (2004, July 19). Rolling the dice. *Hotel and Motel Management, 219*(13), 1.

Alsop, R. (1983, February 10). Reaching for a star is hectic and costly, Atlantic City finds. *Wall Street Journal*, p.1.

Apuzzo, M. (2005). *Despite limited profits, casinos repackaging poker as attraction.* Retrieved December 13, 2005 from http://www.phillyburbs.com/pb-dyn/news/104-04092005-473935.html

Atlas, R. (1995, May 8). Sex sells. *Forbes, 155*(10), 49-50.

Bay, H. W., Hardin, T., Alonzo, V., & Welch, S. J. (2004). Las Vegas. *Successful Meetings. 53*(12), 64 –72.

Binkley, C. (2001a, June 11). Aladdin casino bets on a new concept: A theater that morphs into a nightclub. *Wall Street Journal*, p. B6.

Binkley, C. (2001b, July 6). Las Vegas redefines family entertainment: Note the g-strings - The shows are showing a lot under the guise of art; 'La Femme' inspires visions, *Wall Street Journal*, p. A1.

Binkley, C. (2003, July 15). Park Place to get new name, image; owner of Caesars Palace is poised to revitalize its flagship hotel-casino. *Wall Street Journal*, p. D3.

Blattberg, R. C., Briesch, R. & Fox, E. J. (1995). How promotions work. *Marketing Science, 14*(3), G122-G132.

Boyd Gaming. (2006). *Boyd Gaming Unveils Las Vegas Strip Development Plan.* Retrieved February 23, 2006 from http://phx.corporate-ir.net/phoenix.zhtml?c=95703&p=irol-newsArticle&ID=800095&highlight=

Brueckner, J. (1993). Inter-store externalities and space allocation in shopping centers. *Journal of Real Estate Finance and Economics, 7*, 5-16.

Casino Connection. (2004, December). *2005: A Look Ahead.* Retrieved December 30, 2005, from http://www.casinoconnection.com/articles/2005__A_Look_Ahead

CasinoMan. (2003, March 22). *Park Place betting on Dion success*. Retrieved March 13, 2005 from http://www.casinoman.net/Content/casino_gambling_news/article/park_place_betting_on_dion_success.asp

Christiansen, E. M., & Brinkerhoff, J. J. (1995). Gaming and entertainment: An imperfect union? *Cornell Hotel and Restaurant Administration Quarterly, 36*(2), 79-94.

Churchill, G. A. (1995). *Marketing Research: Methodological foundations* (6th ed.). Orlando, FL: Harcourt Brace.

Cruz, M. (2004, April). Indian tribes place bets on diversification. *San Diego Metropolitan Uptown Examiner & Daily Business Report*. Retrieved December 13, 2005 from http://www.sandiegometro.com/2004/apr/coverstory.php

Dandurand, L., & Ralenkotter, R. (1985). An investigation of entertainment proneness and its relationship to gambling behavior: The Las Vegas experience. *Journal of Travel Research. 23*(3), 12-16.

Eppli, M. J, & Shilling, J. D. (1995). Large-scale shopping center development opportunities. *Land Economics, 71*(1), 35-41.

Fink, J., & Simpson, J. (2006). "Avenue Q" dead-ends: City's "Broadway West" image takes a hit. *Las Vegas Sun*. Retrieved February 21, 2006 from http://www.lasvegassun.com/sunbin/stories/lv-other/2006/feb/16/566614402.html

Friess, S. (2005, February 11). Las Vegas bets on Broadway. *The Christian Science Monitor*. Retrieved February 23, 2006 from http://www.cbsnews.com/stories/2005/02/11/entertainment/main673187.shtml

Gaming Industry: Now, fun for the entire family (1994, February). *Institutional Investor, 28*(2), 13.

Gerbich, M. (1998). Shopping center rentals: An empirical analysis of the retail tenant mix. *The Journal of Real Estate Research, 15*(3), 283-296.

Greene, W. H. (2003). *Econometric Analysis* (5th ed.). Upper Saddle River, NJ: Prentice-Hall.

Guier, C. S. (1999). Broadway shows in spotlight. *Amusement Business, 111*(37), 13.

Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.

Harrah's Entertainment Inc. (2003). *Harrah's survey 2003: Profile of the American casino gambler*. Las Vegas, NV: Harrah's Entertainment, Inc.

Harrah's License Company, LLC. (2004). *Harrah's signs definitive agreement to acquire Binion's Horseshoe.* Retrieved January 13, 2005 from http://investor.harrahs.com/news/20040122-127143.cfm

Harvey, A. C. (1990). *The economic analysis of time series* (2nd ed.). The MIT Press, Cambridge, MA.

Hope, J., & Havir, L. (2002). You bet they're having fun! Older Americans and casino gambling. *Journal of Aging Studies, 16*(2), 177-197.

Houston, M. B. (2004). Assessing the validity of secondary data proxies for marketing constructs. *Journal of Business Research, 57*, 154-161.

Jones C. (2004, April 29). Report says LV extends reign as convention king: City ranks atop Tradeshow Week list for 10th year. *Las Vegas Review-Journal.* Retrieved February 23, 2006 from, http://www.reviewjournal.com/lvrj_home/2004/Apr-29-Thu-2004/business/23759088.html

Kaplan, A. (1981). Interrelationships between casino gambling and entertainment, unpublished paper, University of Denver; Denver, Colorado.

Kilby, J., Fox, J., & Lucas, A. F. (2004). *Casino operations management* (2nd ed.). New York: Wiley.

Kotler, P., Bowen, J. T., & Makens, J. C. (2005). *Marketing for Hospitality and Tourism* (4th ed). Upper Saddle River, NJ: Prentice Hall.

Lam, S. Y., Vandenbosch, M., Hulland, J., & Pearce, M. (2001). Evaluating promotions in shopping environments: Decomposing sales response into attraction, conversion, and spending effects. *Marketing Science. 20*(2), 194 -214.

Las Vegas Convention and Visitor Authority (2003). *Las Vegas Visitor Profile.* Retrieved March13, 2005 from http://www.lvcva.com/pdf/VPS-2003LasVegas.pdf

Las Vegas Online Entertainment Guide. (2004). *History of Las Vegas*. Retrieved March 13, 2005 from http://www.lvol.com/lvoleg/hist/lvhist.html

Loroz, P. S. (2004). Golden age gambling: psychological benefits and self-concept dynamics in aging consumers' consumption experiences. *Psychology Marketing, 21(5),* 323-349.

Lounge singers losing showrooms. (1999). *Gambling Magazine.* Retrieved July 27, 2005 from http://www.gamblingmagazine.com/articles/40/40-245.htm

Lucas, A. F. (2004). Estimating the impact of match-play promotional offers on the blackjack business volume of a Las Vegas Hotel Casino. *Journal of Travel & Tourism Marketing, 17*(1), 23-33.

Lucas, A. F., & Brewer, K. P. (2001). Managing the slot operations of a hotel casino in the Las Vegas locals' market. *Journal of Hospitality and Tourism Research, 25*(3), 289-301.

Lucas, A. F., & Bowen, J. T. (2002). Measuring the effectiveness of casino promotions. *International Journal of Hospitality Management, 21*(2), 189-202.

Lucas, A. F., Dunn, W. T., & Singh, A. K. (in press). Estimating the short-term effect of free-play offers in a Las Vegas hotel casino. *Journal of Travel and Tourism Marketing.*

Lucas, A. F., & Kilby, J. (2002). Table games match play offers: Measurement & effectiveness issues. *The Bottomline, 17*(1), 18-21.

Lucas, A.F., Kilby, J., & Santos, J. (2002). Assessing the profitability of premium players. *Cornell Hotel and Restaurant Administration Quarterly, 43*(4), 65-78.

Lucas, A. F, & Santos, J. (2003). Measuring the effect of casino-operated restaurant volume on slot machine business volume: An exploratory study. *Journal of Hospitality & Tourism Research, 27*(1), 101-117.

MGM Mirage. (2004). MGM Mirage 2004 Annual Report. Retrieved December 30, 2005 from http://media.corporate-ir.net/media_files/irol/10/101502/reports/MGM_MIRAGE_2004_AR.pdf

Nevada Gaming Control Board. (1995). *Nevada gaming abstract.* Las Vegas, NV: Gaming Control Board.

Nevada Gaming Control Board. (2005a). *Nevada gaming abstract.* Las Vegas, NV: Gaming Control Board.

Nevada Gaming Control Board. (2005b). *The Gaming Revenue Report.* Las Vegas, NV: Gaming Control Board.

Norusis, M.J. (2000). *SPSS 10.0 Guide to Data Analysis.* Upper Saddle River, NJ: Prentice-Hall.

O'Neil, M. E., Palisano, R. J. & Westcott, S. L. (2001). Relationship of therapists' attitudes, children's motor ability, and parenting stress to mothers' perceptions of therapists' behaviors during early intervention. *Physical Therapy, 81*(8), 1412-1424.

Palmeri, C. (2004a, June 21). Rebuilding the roman empire; Can a massive makeover return Caesars to its old Vegas glory? *Business Week, 3888*, 25-126.

Palmeri, C. (2004b, December 13). The $600 million circus maximus. *Business Week*, 3912, 81.

Parsons, A. G. (2003). Assessing the effectiveness of shopping mall promotions: Customer analysis. *International Journal of Retail & Distribution Management. 31*(2/3), 74-79.

Pfaffenberg, C. J., & Costello, C. (2001). Items of importance to patrons of Indian and riverboat casinos. *UNLV Gaming Research & Review* Journal. *6*(1), 33-41.

Pindyck, R. S., & Rubinfeld, D. L. (1998). *Econometric models and economic forecasts* (4th ed.). New York, NY: McGraw-Hill.

Richards, A., Platerink, G. H., & Arnold-Baker, A. (2001, February). You can learn a lot in Vegas. *Global Telecoms Business. 56*, 47.

Richard, M. D., & Adrian, C. M. (1996). Determinants of casino repeat purchase Intentions. *Journal of Hospitality and Tourism Research, 4*(3), 25-39.

Roehl, W. S. (1996). Competition, casino spending, and use of casino amenities. *Journal of Travel Research. 34*(3), 57-62.

Rowe, M. (1994). Las Vegas' big gamble. *Lodging Hospitality. 50*(2), 26-28.

Samuels, J. B. (1999). A qualitative investigation into the characteristics and synergistic relationships of non-gaming recreation/entertainment facilities in casino environments. In W. R. Eadington & J. A Cornelius (Eds.), *The business of gaming: economic and management issues* (pp.303-315). Reno, NV: Institute for the Study of Gambling and Commercial Gaming.

Shim, S. & Eastlick, M. (1998). The hierarchical influence of personal values on mall shopping attitude and behavior. *Journal of Retailing*, *74*(1), 139-160.

Shoemaker, S., & Zemke, D. (2005). The "Locals" market: An emerging gaming segment. *Journal of Gambling Studies, 21*(4), 379 - 410.

Simpson, J. (2003. October 07). *Economic impact: Mirage to take big hit.* Retrieved December 03, 2005 from http://www.reviewjournal.com/lvrj_home/2003/Oct-07-Tue-2003/news/22315265.html

Sit, J., Merrilees, B. & Birch D. (2003). Entertainment-seeking shopping centre patrons: The missing segments. *International Journal of Retail & Distribution Management, 31*(2/3), 80-94.

Srinivasan, S., Pauwels, K., Hanssens, M. D., & Dekimpe, M. G. (2004). Do promotions benefit manufacturers, retailers, or both? *Management Science, 50*(5), 617-629.

Tabachnick, B. G., & Fidell, L.S. (2001). *Using multivariate statistics* (4th ed.). Needham Heights, MA: Pearson Education Company.

TicketsGuarantted. (2005). *Las Vegas shows*. Retrieved September 7, 2005 from http://www.ticketsguaranteed.com/lasvegas.cfm?referrer=0002&OVRAW=Las%20Vegas%20Shows&OVKEY=vegas%20show&OVMTC=standard

Tiscali Music. (2003, March 27). *Celine takes on Elvis*. Retrieved March 13, 2005, from http://www.tiscali.co.uk/music/news/10837.html

Titz, K., Miller, J. L. & Andrus, D. M. (1998). Hedonic scales used in a logit model to explore casino game choice. *Journal of Hospitality & Tourism Research, 22*(2), 129-141.

Turco, D. M., & Riley, R. W. (1996). Choice factors and alternatives for riverboat gamblers. *Journal of Travel Research, 34*(3), 24-29.

Wakefield, K. L. & Barnes, J. H. (1996). Retailing hedonic consumption: A model of sales promotion of a leisure service. *Journal of Retailing, 72*(4), 409-427.

Walters, R. G., & MacKenzie, S. B. (1988). A structural equations analysis of the impact of price promotion. *Journal of Marketing, 25*(1), 51-63.

Walters, R. G., & Rinne, H. J (1986). An empirical investigation into the impact of price promotions on retail store performance. *Journal of Retailing. 62*(3), 237 –266.

Yahoo! Inc. (2005a). *Gambling Industry Profile*. Retrieved March 13, 2005 from http://biz.yahoo.com/ic/profile/casino_1431.html

Yahoo! Inc. (2005b, May 9). *Form 10-Q for MGM Mirage.* Retrieved December 30, 2005, from http://biz.yahoo.com/e/050509/mgm10-q.html

Yoshihashi, P. (1993a, January 8). Gambling: Survey reveals a recent jump in casino goers. *Wall Street Journal,* p. B1.

Yoshihashi, P. (1993b, February 5). Entertainment: Stars fade as Las Vegas bets on families. *Wall Street Journal,* p. B1.

Yoshihashi, P. (1993c, October 4). Streisand to perform for possible record of $20 million in pay. *Wall Street Journal*, p. B.3.

Zikmund, W. G. (2002) *Business Research Method* (7th ed). Mason OH: Thomson South-Western.

VITA

Graduate College
University of Nevada, Las Vegas

Eunju Suh

Home Address:
1655 E.Sahara Ave. #3025
Las Vegas, NV 89104,

Degrees:

Bachelor of Arts, Business and International Office Management, 1999
Ewha Women's University, Seoul, Korea

Master of Hotel Administration
University of Nevada, Las Vegas, 2002

Publications:

Suh, E., & Lucas, A. F. (2006). Estimating the impact of entertainment on gaming volume of Las Vegas hotel casinos. Advances in Hospitality and Tourism Research, 11, 19– 28.

Suh, E., & Lucas, A. F. (2005). A proposal for determining the impact of monetary and non-monetary promotions on slot machine volume. Proceedings of the 2005 Las Vegas International Hospitality and Convention Summit Las Vegas.

Suh, E., & Erdem, M. (2005). Comparative membership analysis via websites: Case study of a web-based casino loyalty program. Proceedings of 2004 International CHRIE Annual Conference.

Myeong E. & Suh, E. (2005). Database Marketing: The case of Marriott and Hilton, Advances in Hospitality and Tourism Research, 10, 636–640.

Suh, E., Erdem, M., Lucas, A. F. & Ramdeen, C. (2004). Effects of slot gaming experience on customers' repeat intentions in a Las Vegas hotel and casino. Proceedings of the 2004 Las Vegas International Hospitality and Convention Summit, 257-274.

Suh, E. J., Love, C., & Bai, B. (2004). An Examination of the Impact of Sponsorship on Attendees' Recognition of Sponsors, Journal of Convention & Event Tourism, 7(1).

Suh, E., & Ramdeen, C. (2004). Forecasting expenses and sales using regression: Forecasts in a gaming environment, Proceedings of the 2004 Las Vegas International Hospitality and Convention Summit, 275-288.

Suh, E., & Erdem, M. (2004). Gap analysis as a diagnostic tool for improving the slot play experience. Proceedings of 2004 International CHRIE Annual Conference, 312-318.

Suh, E., & Ramdeen, C. (2004). Loyalty program effectiveness in the gaming industry: Customer attitudes toward rewards programs. Advances in Hospitality and Tourism Research, 9, 723– 727.

Suh, E., Erdem, M., & Woods, R. H. (2004). Investigating the changing job market for hospitality educators after 9/11. Advances in Hospitality and Tourism Research, 9, 728 – 735.

Suh, E., Love, C., & Bai, B. (2003). Maximizing the impact of sponsorship: An examination of sponsorship on attendees' recognition of sponsors and their attitudes toward corporate sponsorship. Advances in Hospitality and Tourism Research, 8, 636 – 640.

Dissertation Title: Estimating the Impact of Entertainment on the Gaming Volume of Las Vegas Hotel Casinos

Dissertation Examination Committee:
Chairperson, Dr. Anthony F. Lucas, Ph.D.
Committee Dr. Member, Bo Bernhard, Ph.D.
Committee Dr. Member, Kathy Nelson, Ph.D.
Graduate Faculty Representative, Dr. Ashock Singh, Ph.D.