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Estimating the indirect gaming contribution of poker rooms: Is poker room volume a peripheral driver of slot revenue?

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ESTIMATING THE INDIRECT GAMING CONTRIBUTION OF POKER ROOMS:

IS POKER ROOM VOLUME A PERIPHERAL DRIVER OF SLOT REVENUE?

by

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ABSTRACT

**Estimating the Indirect Gaming Contribution of Poker Rooms:
Is Poker Room Volume a Peripheral Driver of Slot Revenue?**

by

Bruce Warren Ollstein

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

This paper examines the effect of poker room volume on slot revenue. Using data from a destination market casino on The Las Vegas Strip, slot coin-in and poker room rake are compared over a 212 day period. With rake as the independent variable and coin in as the dependent variable, a causal model is established that demonstrates a statistically significant connection between the two. Somewhat surprisingly, poker room volume does serve as a legitimate driver of slot revenue. This study advances the literature by establishing this relationship and determining that poker room volume has an indirect income effect on at least one other component of casino operations. However, given the marginal economic benefit when poker-room expenses are considered, managers may still be well-advised to consider other gaming alternatives to maximize the cash flows from valuable casino floor space.

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I would like recognize the contributions of my committee to not only this specific work, but to my success at UNLV. Having completed my undergraduate studies over 20 years ago, it was an intimidating process to return to school and simultaneously pursue two graduate degrees. The members of this thesis committee are not just outstanding, respected scholars whose insights and support have made this experience intellectually rewarding, they are also friends. Each of them has touched my life in a significant way and made me very grateful that my academic journey in graduate school took place at UNLV.

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CHAPTER I

INTRODUCTION

Purpose

The purpose of this study is to estimate the indirect cash flow contribution of a

poker room to slot coin-in at a destination-market casino property on the Las Vegas Strip.

The direct cash flow contribution of any poker room is relatively easy to determine. The

financial statements of any gaming property show revenues and expenses broken down

for various departments. But due to the labor-intensive nature of live poker, which

requires many dealers, the expense of delivering this service is quite high. Additionally,

the relatively slow pace of the game means low revenues, since income is effectively

derived by a service charge per-hand-dealt.

Therefore, the decision to offer a poker room is not an automatic one for a casino.

With minimum direct benefits available, it is up to the possible indirect benefits to justify

the existence of such facilities. Determining and measuring the indirect benefits of poker

on slot revenues is the key purpose of this study.

Practical Significance

On the surface, it seems hard to justify operating a poker room at a casino

property. Even if the rooms are slightly profitable, they may not be the best use of

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available floor space. Management often discusses the indirect benefit of these rooms, but up to this point there is no empirical evidence of this indirect benefit.

Lucas, Dunn, & Kharitonova (2006) studied a similar scenario involving Bingo rooms. They suggested that by offering bingo as a near break-even proposition, casino executives were subscribing to a full-service model. Bingo was believed to lead to extra slot and table game activity. But for this concept to make sense, the extra play needs to cover bingo costs and provide a strong return on the occupied floor space. This same principle holds for poker. By looking at the relationship between poker and coin-in, this study will help managers examine one component of this problem.

Academic Significance

This study offers a functional model and objective process to estimate the indirect contribution of poker rooms in terms of associated gaming volumes. This appears to be the first study to directly address this issue by demonstrating the effect of a one-unit change in the predictor variable on gaming volume. Lucas et al. (2006) addressed this issue specifically with respect to Bingo, but they also established the groundwork for examining other indirect contribution sources. This study should expand the literature in a meaningful direction by focusing on one of the most talked about developments in gaming: The poker phenomenon.

Delimitation

No attempt was made to estimate the indirect contribution of live poker rooms to the table games department. The only table volume captured at this Las Vegas Strip

property was total drop. Because this statistic includes credit play, it is problematic for correlation-based estimation techniques (Lucas & Santos, 2003). It is also worth noting that drop is a gross volume metric. It does not show the amount of money wagered by players, it simply represents their buy-in. Since the casino is not guaranteed a chance to win the buy-in, only what is wagered, this metric is flawed. Since the property being studied is not using automated table tracking, the amount wagered by players at the tables is unknown.

CHAPTER II

LITERATURE REVIEW

The literature review will look at four key areas that provide support for the importance of the proposed study and the hypothesis. Additionally, the review will illuminate how this study will fit in with previous research.

Possible Slot-Revenue Drivers and the Importance of Slots to the Bottom Line

The main reason for selecting coin-in as the dependent variable in this study is because slot performance is so crucial to the success of most modern casino operations. According to Brewer and Cummings (1995), slot revenues have increased significantly as a percentage of total casino revenues. Slots now typically account for anywhere from 50 to 80 percent of total casino revenue. Slot revenues consistently constitute the biggest portion of the total revenues of hotel casinos outside the Las Vegas Strip and downtown markets (Nevada Gaming Control Board, 2005).

Managers at many full-service casinos are committing an ever increasing amount of their time, energy, and resources to slot operations (Brewer & Cummings, 1995). The term coin-in originally referred to the actual coins that customers dropped into the slot machines. Now, many machines do not even take coins, but the term still is used by the industry to explain the amount wagered in slots (Brewer & Cummings, 1995). When the

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term slot machine is used in the industry, it is usually defined as any licensed video poker machine, reel slot machine, multigame machine, or video keno machine (Lucas & Brewer, 2001).

Slots are consistently more profitable than any other part of a casino's operation. Customers apparently feel less intimidated by slots than by other types of games (Growchowski, 1998). People are often worried about making mistakes at the tables, and they fear embarrassment. Slots alleviate this fear and offer a positive reinforcement attribute by the manner of payout being randomized. Additionally, the innovation of new gaming devices and the customer relationship management opportunities of slots combine to allow operators to consistently improve profitability (Growchowski, 1998).

Various studies have looked at ways to improve slot revenue. Lucas and Brandmeir (2005) examined the effect of an increase in par on slot performance. They found that players did not notice the change in the machines. This suggests that a casino might get a players bankroll sooner, and perhaps keep those funds away from a competitor. But the par change did not appear to alter ultimate gaming revenue, since a given player often only has a limited gaming budget that may not be expandable.

Lucas and Brewer (2001) looked at the variation in daily slot handle at a locals' market casino in Las Vegas. They used a regression model to look at different variables that were hypothesized to influence slot handle. They found that food covers failed to produce a significant effect. Direct-mail buy-in incentives and bingo headcounts were both positively related to slot coin-in, but showed questionable economic significance. Temporal variables did seem to be powerful predictors of coin-in. Surprisingly, slot

complimentary room nights did not produce a significant effect. The authors suggested that slot hosts may not have been effectively performing their duties in this circumstance.

Floor location and specific game characteristics were found to affect slot performance in a study conducted by Lucas, Dunn, Roehl, and Wolcott (2004). Slots that were located near table games and demonstrated accessibility and visibility seemed to outperform other machines. Lucas, Dunn, and Singh (2004) found that free-play offers failed to demonstrate evidence of positive cash flows in terms of slot play. But Lucas and Santos (2003) determined that casino-operated restaurant business volume appeared to impact coin-in. Although many possible slot revenue drivers have been analyzed, poker room rake has been ignored. This study will add to the literature in a meaningful direction.

Poker's Popularity and the Pressure on Operators to Offer Poker Rooms as an Amenity

To fully grasp the pressure on casino operators to offer a poker facility, it is helpful to note the most recent response of poker enthusiasts to the Unlawful Internet Gambling Enforcement Act, put into effect on October 13, 2006 (Weinberg & Pruitt, (2006). PokerSiteScout.com, a site that tracks global online poker traffic, noticed a 12% drop in online play on October 16, 2006 followed by a rebound that closed the deficit to 5.4% the very next day. A large number of US poker enthusiasts were fanatical enough to blatantly disregard the law and simply migrate to websites willing to take a chance with them.

This type of aggressive enthusiasm for poker is what keeps the pressure on casino operators to offer poker rooms. The consensus can be summed up by D. Hoenemeyer

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(personal communication, June 18, 2006), Assistant General Manager of both Paris and Bally's Casinos (owned by Harrah's) on the Las Vegas Strip. "We must offer the poker rooms as amenities or risk alienating our valued customers. This is especially true for Harrah's, since we own the WSOP (World Series of Poker). We are in the process of expanding and upgrading our poker rooms at both facilities in an effort to exceed customer expectations." T. Haushalter, (personal communication, June 20, 2006) Casino Administrator, Wynn Las Vegas, agrees. "We must offer this action to our guests. The expectations are enormous." But he is quick to add, "Of course, that does not mean we are really using our floor space effectively to extract the maximum consumer surplus."

Poker is beyond hot. ESPN's broadcast of the World Series of Poker drew ratings almost twice the size of the typical SportsCenter rating, and superior to the average rating ESPN receives for regular-season college football games (Isidore, 2004). Results like these lead some ESPN announcers to only half-jokingly refer to Poker as America's hottest sport.

Hollywood has not been oblivious to the emergence of this new phenomenon. Many screen writers are aware of the growing popularity of poker. And some have been updating movie scripts to appeal to the game's enthusiasts. One vivid example is the newest James Bond action remake, *Casino Royale*, released in November, 2006. In the new film, traditional casino action involving baccarat and roulette is replaced with Texas Hold 'Em poker action. No less than a dozen individual scenes show live poker action and discuss specific details like big and small blinds (the game's player-ante requirements), buy-in and re-buy requirements (the total amount of money an individual is allowed to bring into the game), and even subtle psychological strategy. In one scene,

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the classic poker-luck vs. poker-skill debate is argued by Mr. Bond and his primary love interest in the film. And the game of poker is played by various characters in no less than three different environments, including a villain's private yacht, a fancy country-club, and a luxurious casino.

It is no exaggeration to say that the game of poker is a central focus of this film and carries as much of the plot's structural tension as do the scenes involving gun battles and physical action. Considering the obvious value of the James Bond franchise to the film's producers, it seems reasonable to infer that so much devotion to poker in a remake of an original film that included *no* poker is not an accident. It clearly was a strategic marketing decision aimed at capturing some of the buzz and excitement that surrounds the game of Texas Hold 'Em poker. The researcher of this study made visits to 11 Las Vegas poker rooms immediately after the release of the film. It was observed that in each facility, many of the staff and customers had seen the film, and some were enthusiastically willing to debate the film's merits and its accuracy in portraying the game's subtleties.

The hype is staggering, and the draw of the game has celebrities putting their careers at risk to satisfy their cravings. Alex Rodriguez, better known as A-Rod, the New York Yankee considered by many fans to be the greatest active player in MLB, has been spotted frequenting illegal poker rooms in New York City with poker star Phil Hellmuth. Despite warnings from team management, the sports icon appears unable to resist the lure of the game – poker, not baseball ("Yankees warn A-Rod," 2005, November 2).

In 2005, the American Gaming Association [AGA] (2005) determined that 18% of American adults played the game. This was a 50% increase from the previous year.

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Every age group reported more players. In 2004, the AGA recognized 446 card rooms in five states as generating over $1 billion in gross revenue. In Nevada and New Jersey, Americans spent $151.7 million on organized poker in that same year (45% more than the year before).

Companies like Shuffle Master, Inc. have cashed in on the poker craze by offering proprietary table games (such as Three-Card Poker) that are house-banked and very profitable for the casino (Barrett, Palermi & Forest, 2004). D. Londo, (personal communication, June 19, 2006), General Manager of Harrah's Cherokee and former Assistant General Manager of Harrah's, Atlantic City, is intrigued by these developments. "Even though the Shuffle Master games were inspired by Live Poker, we still have customers who get done playing and then say, 'Great, now where is your live poker game, I'm ready.' This is not an optimal customer flow from the bottom-line point of view. We would rather have the customer exclusively enjoy our house-banked game from a profitability standpoint. But again, we aim to please. What the customer demands, Harrah's will provide."

Jack Binion, considered by many to be the game's true patriarch, believes that nearly 60,000 people are playing online poker during peak hours in the US (Bentson, 2004). The World Poker Tour (WPT) is on the Travel Channel, and ordinary Americans feel they can watch it on TV one week and possibly compete in it the next (Brush, 2005). T. Haushalter of Wynn, Las Vegas (personal communication, June 20, 2006) believes that not being listed in the Card Player magazine poker room directory means losing some status as an "in touch" casino. Slots Today magazine has even changed its

masthead to include the word "poker," apparently as an attention grabber for crossover enthusiasts (Dalla, 2005).

Gary Thompson, a Harrah's spokesperson, says that TV cameras showing hole cards in poker events were the catalysts for the game's breakout success. The cameras allowed the fans to get inside the heads of the players and even be one up on them (Draper, 2004). Awareness of the game has increased in many different population circles. For example, poker is a popular discussion topic among many current college students. One University of Nevada, Las Vegas (UNLV) student recently made the front page of *The Rebel Yell* (the student newspaper) for apparently paying his tuition with poker winnings (Fellows, 2005). Numerous surveys suggest that gambling is regaining social acceptance across the US (Davidson, 1996). D. Hoenemeyer (personal communication, June 18. 2006) believes that poker may be helping to accelerate that trend.

An August 2006 article in Slots Today profiled various female poker players, and talked about their empowerment (Fortune, 2006). Industry executives are quick to point out the connection that females have traditionally been slot players, and now Slot Player magazine is profiling female poker stars. The pressure on operators to embrace poker is seemingly everywhere.

Poker Cruises are now quite popular. Card Player Cruises recently hosted 2,000 poker players and their families on the 2005 PartyPoker.com Million IV extravaganza. An entire cruise ship was chartered to accommodate the event (Gros, 2005).

New stars are being born from the game, including Ivey and Negreanu. These heroes of poker represent a glamorous image that is alluring to many (Legato, 2005). TV

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Poker has many of the characteristics of reality TV shows like Survivor. Americans see themselves in the situation of the players. They don't see the players as unapproachable stars, but as regular "Joes" who caught a break (Luker, 2005). This seems to be good for the gaming industry which now uses these programs to run product placement (Luker, 2005). Major celebrities add to the hype. Ben Affleck and Matthew Perry are regularly seen playing poker or talking about it (Streisand & Silver, 2004).

All this excitement has led to some real increases in revenue for many poker rooms. Foxwoods Casino claims that poker revenue has doubled in the last two years (Thomaselli, 2004). But at many casinos, the fact that poker-room revenue is up does not necessarily mean that casino revenue is being optimized. It seems reasonable to ask: Why are major casinos giving valuable space to poker, regardless of its popularity, if poker generates minimal ROI when compared with other gaming activities? Conventional wisdom says, "Players become customers and hotel guests, spending additional money on shows, meals, and other games. And when they bring their spouses or families along, the ancillary revenue increases. In this day and age, with poker as popular as it is, a poker room is an amenity that many customers expect" (Wiser, 2004, p. 86).

Harrah's, the firm that owns the World Series of Poker (WSOP) brand, seems to believe this claim. The company operates 98 permanent poker tables at seven casinos on The Strip in Las Vegas. This study will assess the validity of such a claim and apply metrics to presumptions in the existing literature.

In May of 2006, 906 poker tables throughout Nevada generated $13.3 million in gaming revenues, according to the Gaming Control Board (Stutz, July 23, 2006). In the

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last year Nevada poker tables generated $152 million in revenue, a 33% increase from the previous year. The game of poker is certainly hot, but are poker rooms a logical use of valuable casino floor space?

Poker as a Poor Use of Available Casino Floor Space

Although the individual poker hands last too long and the casino's cut is too small to make poker a valuable addition to the bottom line, many destination hotel-casinos are no longer comparing poker to slots, and are simply considering the game to be a must-have amenity (Apuzzo, 2005). Poker accounts for less than 1% of Nevada gaming revenue. With just five slot machines, a casino is able to exceed a poker table's earning power while simultaneously downsizing dealers and support staff (Apuzzo, 2005).

"This is not profitable," according to Sylke Finnegan, a spokesperson for the Golden Nugget. And some casinos are talking action on her statement. Mohegan Sun, a direct competitor with Foxwoods, just closed its poker room, adding more slots. Management is happy with the results (Apuzzo, 2005).

But the trend is going the other way. Twenty-five Nevada casinos have added poker rooms in just the last two years. David Strow, a Harrah's Spokesperson, expects that most of these market entrants will "see an indirect increase in casino revenues, overall". Because the games are labor intensive and carry no house edge, few operations even try to justify the direct revenues (Apuzzo, 2005).

Blue Chip Casino, operating out of a riverboat in Indiana, was seeing outstanding improvements in poker revenue. But they made a decision to switch out the floor space for more slots. "It was a square-footage issue," said Bret Cox, the Table Games director

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(Grochowski, 2004a). California's Barona casino is actively embracing the poker excitement. Management believes that poker does increase foot traffic for the slots, blackjack, and other games (Grochowski, 2004b).

Binion believes that poker is only needed as an amenity. "Casinos do not need poker rooms to stay competitive" (Gros, 2005). He believes the current excitement may be an unsustainable fad. He feels that poker will remain more popular than before it was effectively televised, but nowhere near its peak. Harrah's 2006 Survey does put the excitement in perspective; 71% of gamblers play the slots, 14% play table games, and only 2% play live poker.

An interesting compromise may become more available soon. PokerTek, Inc. has developed an electronic/automated live poker table. It enables 60% more hands to be played without a live dealer. It uses virtual cards and virtual gaming chips. Because many players were first exposed to the game online, the company feels that this medium will make players comfortable. The firm predicts no dealers at poker tables within a few decades (Hodl, 2006).

In a sense this development is a rational attempt to monetize an otherwise uncomfortable business environment. PokerTek is traveling in the same direction as firms like Shuffle Master, Inc. These companies are attempting to find solutions for casino management which will keep players happy with access to poker-like games, while addressing the profitability problem.

Vic Taucer (2005), a gaming consultant, states that poker rooms are just not profitable enough to justify their own existence. "These games are low margin at best, generating income for the casino of about $60-80 per hour per game...one hand can take

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four minutes to play out, and you can't expect more than 20-25 hands per hour." After payroll is factored in, Taucer believes the only way poker rooms can be justified are via the growth component to generate revenue in other parts of the casino. Adding poker to drive slot revenue is a good idea, according to Taucer, if it actually works.

A study on the hedonistic differences between table game players and slot players suggests that the two groups are driven by different emotional constructs (Titz, Andrus, & Miller, 2004). If poker players on average are even more different from slot players than blackjack players, there may be only limited population crossover with respect to poker and slots. An earlier study by the same researchers suggested that table games players are not as impulsive as slot players (Titz, Miller, & Andrus, 1998). This finding may also suggest indirectly that poker players, often believed to be less inclined to "gamble" than table players, have little in common with slot enthusiasts.

Nonetheless, poker rooms are believed by many to improve a property's image (Ward, 2005a). Some operators suggest that without them customers will walk (Ward, 2005b). This study will attempt to determine if losing them is really that important.

Factors that May Indirectly Drive Slot Coin-In / Does Poker Help?

In the classic article on servicescapes, Bitner (1992) addresses the ability of the physical environment to facilitate the achievement of organizational goals. Her work looks at how customers might choose to interact with a business because of characteristics in their immediate surroundings. Although she does not specifically address poker, it is reasonable to infer that the physical and overall environmental aspects

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of an exciting poker room might add value to the overall casino servicescape for certain consumers.

In her paper, Bitner (1992) expands on studies by Bell, Fisher, and Loomis contending that individuals respond to their environments holistically. Even though we perceive discrete stimuli, it is the total configuration of stimuli that determines our responses to the environment. A multifaceted physical environment like a poker room may offer certain stimuli that motivate individuals to engage in firm-benefiting behaviors, such as spending more of their trip bankroll in a particular casino's slot machines. Bitner believes that complexity in the servicescape increases emotional arousal, and she suggests that arousal may lead to beneficial consumer behaviors.

Wakefield and Blodgett (1996) suggest that the quality of the servicescape can lead to increased consumer satisfaction, which in turn can lead to longer visits to a particular facility. The study looked at facility aesthetics, which could very well be influenced by the existence of a poker room.

Johnson, Mayer, and Champaner (2004) examined casino atmospherics from the customer's perspective. Looking at theme, floor layout, ceiling height, employee uniforms, and noise level, they found that theme, uniform, and noise level contributed positively to a player's satisfaction with the gaming experience. Poker room operations can theoretically influence all three of these variables. It is possible that non-poker players may still be influenced by the existence of a poker room on property.

A study on gaming customer satisfaction observed that the variable Atmosphere had the greatest impact on slot player satisfaction in a regression model (Mayer, Johnson, Hu, & Chen, 1999). Again, if the poker room is contributing to the quality of the

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casino's atmosphere in a positive way, it might help increase other gaming revenues. However, if the poker room is having a negative impact, the opposite could occur.

Blattberg, Briesch, and Fox (1995) determined that advertised promotions are correlated with increased store traffic in a retail environment. According to D. Londo (personal communication, June 19, 2006), the event driven nature of poker rooms can act like an advertised promotion. "People hear about the room or they see an ad for it. This gets them to our property. Then they shop throughout our 'store' and maybe play our slots."

A study examining both new-products and promotions found that new-product introductions contribute more to improved long-term financial performance than promotional efforts on existing products (Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004). Although poker exhibits characteristics of both categories, in the mind of many consumers it is effectively a new-product. "TV exposure of poker in the last few years has generated a sense of...wow, neat new game," says Wynn's Haushalter (personal communication, June 20, 2006), "Even though poker has been there all along."

If poker is perceived to be a form of entertainment, similar to a comedy show or dance review, it may drive other forms of gaming revenue. Dandurand and Ralenkotter (1985) found a significant relationship between entertainment and gambling behavior. Harrah's views its purchase of the World Series of Poker as an opportunity to convert poker enthusiasts (seeking the entertainment benefit of poker) into long-term gaming customers capable of enjoying other activities, including slots (Fitch, 2004). G. Shanks Senior Vice President of Brand Management for Harrah's, glowing declares that "The

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World Series of Poker is the richest and most prestigious gambling event on the planet" (Fortune, 2005).

New house-banked table games like *Wild Hold 'Em Fold 'Em*, devised by Casinovations, and offered at Majestic Star Casino in Gary, Indiana, are another way that live poker appears to be generating indirect revenue streams (Grochowski, 2004b). This game has a house edge of 6.9% and is popular with guests. It seems unlikely that such a product would even exist were it not for the popularity and inspiration of live poker rooms. Still, it is worth noting that such a game might be profitable at a casino without live poker. T. Haushalter, (personal communication, June 20, 2006), Wynn Las Vegas, believes that some of these games would still be popular, regardless of Poker's current renaissance. "You have to realize that Video Poker has been thriving for decades. Is there an increase in interest in all poker products because of the new excitement? It would appear so, certainly. But no one has put any real metrics to this issue." Economic game theory suggests that in this situation a casino might be optimizing its competitive strategy by allowing its neighbors to operate low-margin poker rooms while the game-theorist offers only the more profitable house-banked game (presumably enjoyed by customers who learned of poker via a competing casino's live poker-room operation).

A Harrah's Survey found that 39% of amateur poker players play for "the challenge," and 32% play for "the excitement" (Harrah's survey, 2004). One might reasonably speculate that the players who mostly crave the *challenging* aspects of poker would be less likely to participate in slot play. And it would seem possible that poker players who crave *excitement* might enjoy slot play due to its exciting qualities. A player whose attributes are mixed would be a fifty/fifty bet for slot operators. On average,

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amateur poker players believe that the game is 65% skill and 35% luck. This perception is distinct from slot players who generally view their gaming pastime as being 100% luck. The difference between slot and poker players in this respect suggests that transfer of personal interest from poker to slot machines may be difficult.

In *The Journal of Consumer Behavior,* one research team found that a business that reaches out to "the style leaders" who live a "cool" lifestyle may be able to reap economic rewards (Nancarrow, Nancarrow, & Page, 2002). Poker would appear to be reaching this desirable group of consumers. A. Rolfe (personal communication, June 20, 2006), Nevada State Manager, Remy-Countreau, feels this group of consumers will benefit many different industries. "The marketing research that we've seen suggests that this 'cool' segment has a less-elastic price-elasticity of demand than most other segments. If an industry or a given firm can tap into this group, it should be able to obtain better margins and great word-of-mouth marketing. It's a phenomenon that my firm has been tracking with regard to premium bottle-service at night-clubs in casino environments." It is difficult to imagine another specific, consumer-driven, recreational activity in the United States at this moment in history that is more associated with the young, the hip, and the cool than poker. Of course, that connection also suggests a possible barrier to converting poker players into slot players. While slots may be a very satisfying form of gaming recreation, even their biggest fans would seem unlikely to describe slot machines and slot players as *cool.*

Roehl suggested that scholars and casino managers should both be concerned about the role of amenities on a casino's bottom line (Roehl, 1996). Richard and Adrian determined that casino repeat purchase intentions are a function of the games offered at a

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casino and the extra amenities of a casino (Richard & Adrian, 1996). Although poker was not considered in their study, it is possible that the existence of a poker room might be considered either a desirable game or a valuable amenity. In either case, if it were to encourage return visits, it would be indirectly impacting the casino's revenue stream.

Another important factor in determining if a consumer will visit a particular casino was the recommendation of a friend or relative (Turco & Riley, 1996). This would seem to lend support to the idea that if a poker player enjoys a particular property and recommends it to a friend, that friend is more likely to visit the property. If that friend happens to be a slot player, then poker may be capable of serving as a peripheral driver of slot revenue.

In summary, although the opinions of trade journal authors and practitioners run the full spectrum, there is a significant amount of industry opinion (D. Hoenemeyer, personal communication, June 18, 2006) that suggests or implies the ability of poker and poker rooms to serve as drivers of revenue in the casino. Specifically, it appears possible that poker rooms could be a peripheral driver of slot coin-in. This study will examine these possibilities with data from a destination-market, Las Vegas Strip casino.

The Theoretical Model as depicted in Figure 1 resulted from the literature review of previous models designed to explain the variation in daily gaming volumes (Lucas, 2004; Lucas & Bowen, 2002; Lucas & Brewer, 2001; Lucas, Dunn & Kharitonova, 2006; Lucas & Santos, 2003). Slot volume, specifically, has been successfully explained by Lucas and Brewer (2001) and Lucas and Bowen (2002). Both teams explained 87% of the variance in slot volume using slightly different models. Most of the research on slot coin-in uses time-series data and examines seasonality variables, like day-of-the-week,

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and holidays. Variables such as restaurant head-count, hotel occupancy, and day-of-the-week are not put together in any one model due to multicollinearity problems. These problems are related to associated business volumes (Lucas & Kilby, 2002).

The daily poker rake variable represented daily poker volume. Estimating this effect was the primary purpose of this study. The Promotions variable described the promotional slot, table games and poker tournaments. Promotion variables have been used to good effect by various researchers, including Lucas and Bowen (2001). The day-of-the-week variable was found in all of the previous studies and was specifically identified as a powerful predictor by Lucas and Brewer (2001), Lucas and Bowen (2002), and Lucas and Santos (2002). The holiday variable was also found to be significant variable in past literature. Lucas and Brewer (2001), Lucas and Bowen (2002), and Lucas and Santos (2002) all found the holiday variable significant. Aggregate daily coin-in, the model's dependent variable, represents the dollar amount of all wagers accepted by the casino's slot machines each day. The model-variable operationalization will be further expressed in the methodology section.

Hypothesis

Based on the analysis of the literature, researcher posits the following null hypothesis:

H_0: $B_{rake} = 0$

Null H: There is no relationship between daily poker rake and daily coin-in.

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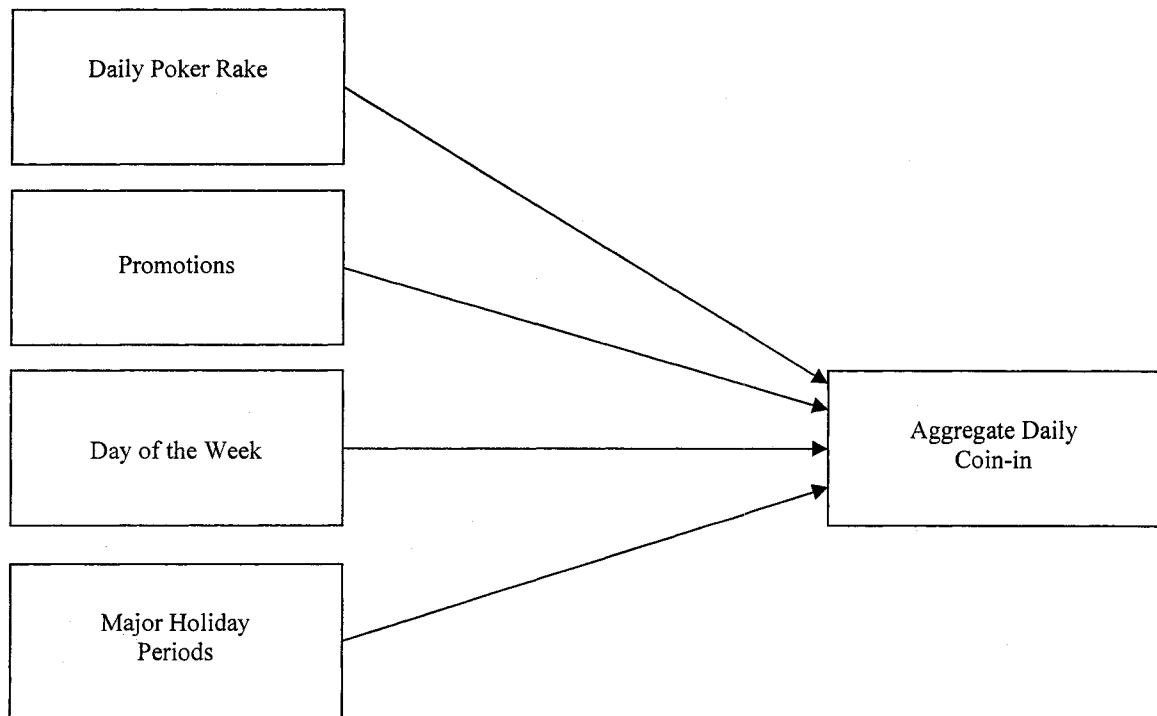
Figure 1. General theoretical model for aggregate daily coin-in.

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CHAPTER III

METHODOLOGY

Data Sources

The secondary data were gathered from the records of a Las Vegas Strip hotel casino. The casino operates a poker room but relies primarily on slot machines for the majority of its revenues. With regard to integrity, the data were subject to internal and external audits. The data set included daily results across a 212-day period, beginning on February 1, 2005 and ending August 31, 2005. Due to the proprietary nature of the data and the donors' request for anonymity, no additional financial details are available for publication.

Data Analysis

The data were screened in SPSS (version 14.0) and subsequently analyzed in EViews (version 4.0). The EViews software addresses the serial correlation of error terms that is often present in time series data analysis. The hypothesis was tested via simultaneous multiple regression analysis at the 0.05 alpha level. Following the hypothesis testing, numerous diagnostics and scatter-plots were reviewed for violations of multiple regression assumptions.

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Expression of Criterion Variable

Aggregate daily coin-in (coin-in) represented the dependent variable in the data set. Coin-In was the wagered dollar-amount made for all coin- or voucher-operated gaming devices. A number of different slot machine systems were available at this casino property. The types available included video keno, video blackjack, reel slots, video poker, and progressives.

Expression of Predictor Variables

In this study, daily poker rake (poker rake) was the variable that represented the aggregate daily poker rake for each day of the study. Rake is the house fee charged to poker players for the use of the poker room. Because live poker rooms pit customers against one another (customer v. customer) rather than against the house (customer v. casino), poker is not a house-banked or house-advantage game. In order to make money, poker rooms charge a fee, called a rake, which can be assessed, much like a tax, in a variety of ways. Nevada state law caps the rake at 10% of each pot (Stutz, July 23, 2006).

One method of charging the rake is to take 10% of every pot up to a maximum of $4. Another method is to charge a time fee, such as $5 per player, every half hour. Some facilities will charge a fee for the player who sits behind the dealer button. In poker, the dealer position is occupied by the last person to act, and therefore it is widely considered to be the most strategically advantageous position. Every new hand the dealer button moves clockwise in order to give each player a chance to be in the best strategic position. In some houses, this is what determines the source of the house fee.

Rake is a reasonable measure of poker volume, since it is a measure of wagering activity. Under most circumstances, the more hands that are played, the greater the rake received by the casino. In certain situations like tournaments, entry fees are charged rather than extracting a rake from each pot. However, these fees are included in the study casino's daily rake figures as a matter of accounting. If another study were to look at a different casino, it would be important to determine if this same procedure was being followed.

The promotions variable represented the marketing efforts of the casino's gaming tournaments. For example, these individual offers to participate in the tournament were based on the theoretical value of each player's tracked, historical, gaming play based either their slot, table game or poker behaviors. The slot tournament variable was assigned a value of one on the days the casino held a slot tournament and a value of zero on all other days. A value of one was assigned for table game tournaments on the days the casino held a table game tournament, such as a blackjack tournament, and a value of 0 was assigned on all other days. The poker tournament variable was assigned a value of one on the dates when the casino held a poker tournament and a value of zero on all other days.

The day-of-the-week variables were used to identify the seasonality that is found in a casino during the course of a week (Lucas, Dunn, & Kharitonova, 2006). Each day of the week variable was assigned a value of one to represent the current day, with the remaining day-of-the-week variables assigned a value of zero. For example, data that fell on a Friday was coded as a one under the Friday day-of-the-week variable. The Saturday through Thursday day-of-the-week variables were coded as zeros. Tuesday was selected

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as the base period for the day-of-the-week variables to determine whether the coin-in on the other days were statistically different from the base period level. To reduce multicollinearity in the model, only the significant day-of-the-week variables remained in the final model.

The major holiday periods were also represented in a binary format. Each holiday variable was assigned a value of one for the actual given holiday day and its corresponding holiday period. For example, the day of the week on which the actual holiday falls can affect the business volume of days prior to or following the holiday. Therefore, some holiday periods lasted only one to two days where others lasted a few days longer.

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CHAPTER IV

RESULTS

Data Screening

When reviewing the data, several additional analyses were run to ensure that the

basic assumptions of regression were met for the model. The first test was to identify

that there was a linear relationship between coin in and poker rake. This was done with a

scatter-plot of the two variables. As seen in Figure 2, the visual inspection of a residual

scatter-plot of Coin-In and Poker Rake provides evidence of a strong positive linear

relationship. The results did identify initial potential concern for a few outliers.

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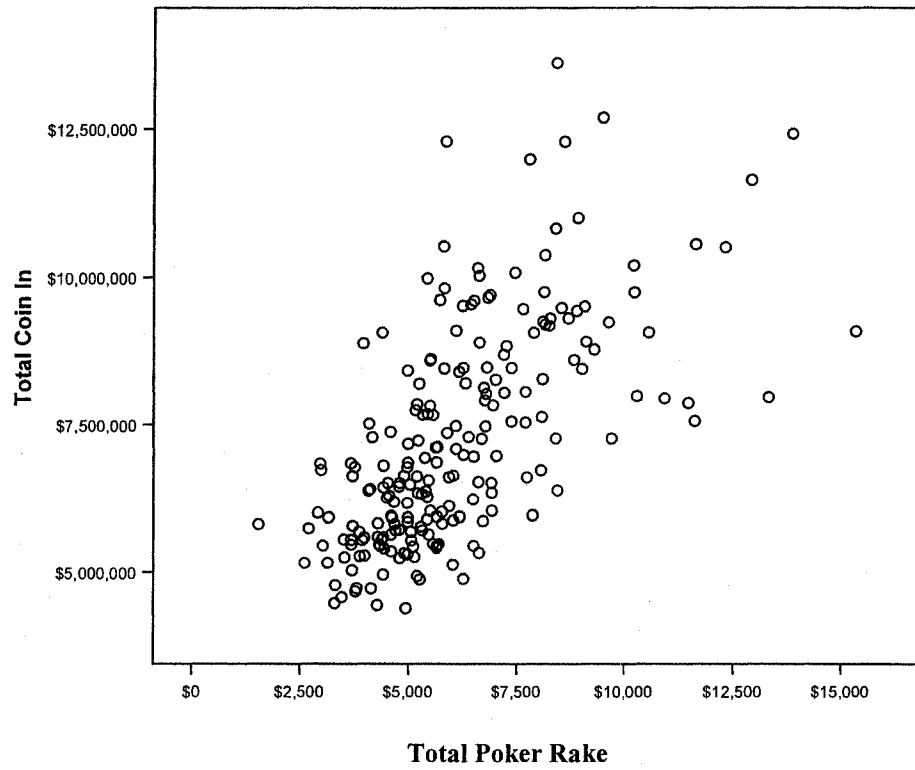
Figure 2. Scatterplot of coin-in and poker rake variables.

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The second set of tests run were the residual histograms which were used to identify normality. The residual histogram of coin-in, found in Figure 3, showed a positively skewed distribution. The residual histogram of daily poker rake, found in Figure 4, was also found to have a positively skewed distribution. Both findings are typical for gaming data and do not indicate a problematic departure from normality. Again a few outliers were identified.
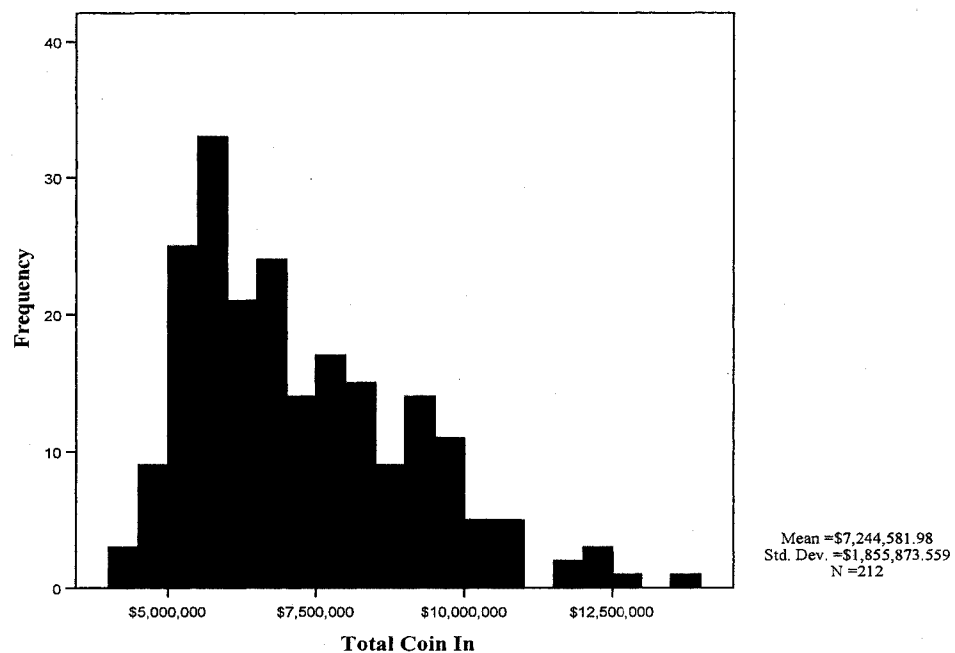
Figure 3. Histogram of daily coin-in.
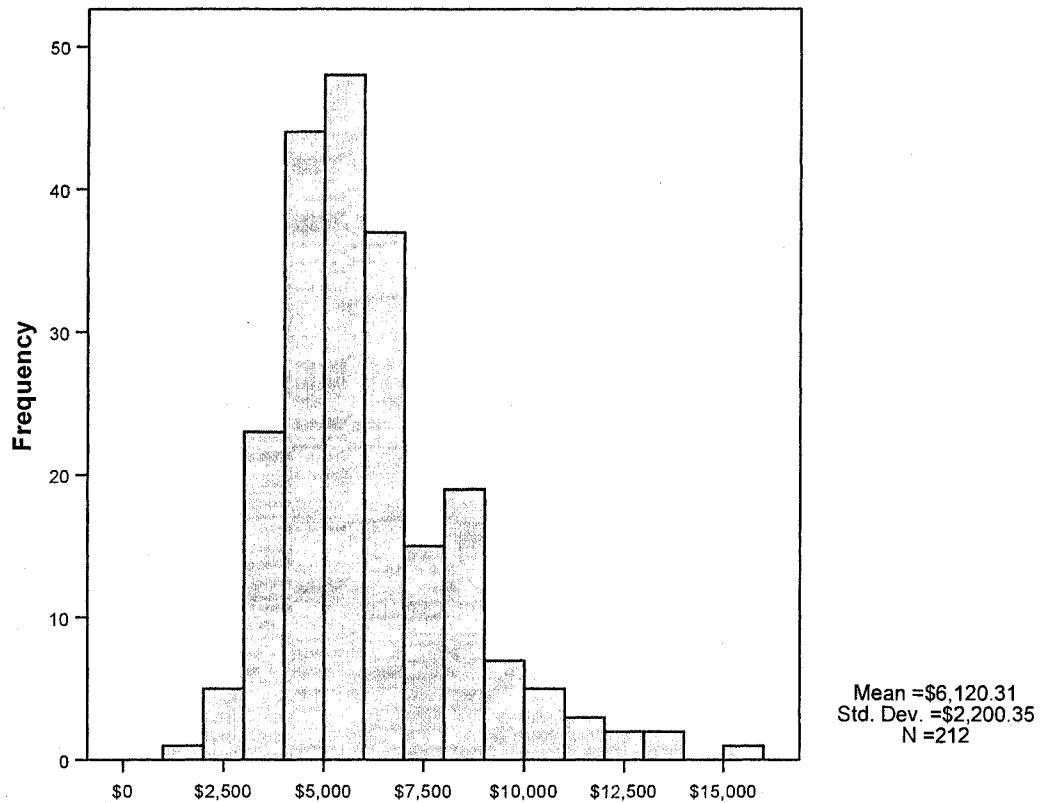
Figure 4. Histogram of daily poker rake.

Next, descriptive statistics of the data were reviewed for further analysis. Table 1

is a summary of the descriptive statistics for daily coin-in, the dependent variable and

daily poker rake, the independent variable. Line graphs plotting the dependent variable

values against time were reviewed for seasonality trends across the data period studied. A

slight but steady downward trend was identified in the data set, resulting in the addition

of the Trend variable. This variable was expressed by setting the first day of the sample

equal to one and increasing its value by one each day. Therefore, Trend ranged in value

from one to 212.

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Table 1

Descriptive Statistics for Key Variables: Coin-In Data Set (n = 212)

Variable ($):	Minimum	Maximum	Mean	Median	Std. Dev.
Daily coin-in	4,388,686	13,620,385	7,244,582	6,789,861	1,855,874
Daily rake	1,555	15,347	6,120	5,653	2,200

Table 2 summates the frequency of the categorical variables. The variables representing Mondays, Tuesdays, and Wednesdays were ultimately omitted from the model, as these variables' values were not significantly different from each other on these days. Instead, these variables served as the base period from which all other day-of-the-week variables varied.

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Table 2

Frequency Statistics of Categorical Variables: Coin-In Data Set (n = 212)

Variable:	f^a
Thursday	30
Friday	30
Saturday	30
Sunday	30
Tax Season	7
NASCAR	5
July 4	4
Chinese New Year	4
Presidents Day	4
Easter Day	4
Memorial Day	4
Super Bowl Game	3
St Patrick's Day	3
March 11	1
July 30	1
Slot Tournament	57

Note. [a] The frequency of categorical variables. The number of days the variable was assigned a value of 1.

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The variable statistics were next used to identify the entire span of major holiday periods. The only holidays that failed to be statistically significant were the Easter and St. Patrick's weekends. The remaining holiday variables were found to be statistically significant and remained in the final model. The descriptive statistics were also used to pinpoint the outliers as noticed in the scatter-plots and histograms. The outliers were identified as March 11, July 30 and April 15 - 21 (tax season).

Of the three gaming types of gaming tournaments held during the 212 day period, only slot tournaments were found to be statistically significant. Therefore both poker tournaments and table tournaments were not included in the final model.

Table 3 contains bivariate correlation coefficients. Both coin-in and poker rake were found to be negatively correlated in their relationship to trend. Therefore, as trend increases, both coin-in and poker rake decrease. In relationship to each other, coin-in and poker rake were positively correlated. Therefore, as poker rake increases, so does coin-in.

Table 3

Intercorrelations Between Model Variables: Data Set (n=212)

	Trend	Coin In	Poker Rake
Trend	--	--	--
Coin In	-.197**	--	--
Poker Rake	-.157*	.647**	--

Note. ** Significant at 0.01 alpha. * Significant at .05 alpha (2-tailed test).

Regression Analysis

The model produced an R^2 of .89. Both the R squared and the adjusted R squared were substantial. The model F statistic of 78.49 was significant (df = 211, 13, p < .0001). The regression analysis results and each variable's corresponding variance inflation factor (VIF) are summarized in Table 4.

Table 4

Summary of Simultaneous Regression Analysis for Variables Predicting Average Daily Coin-In (n = 212)

Variable	[VIF[a]]	B*	SE B
Intercept		5459728.10	254697.70
Slot tournament	1.297	681588.44	142587.64
Thursday	1.262	688961.93	178915.57
Friday	1.761	2174609.40	211399.10
Saturday	2.343	2780696.60	243821.30
Sunday	1.440	1606590.10	191121.48
Super Bowl weekend	1.158	1963818.60	505896.59
Chinese New Year weekend	1.140	2038964.40	435738.38
Presidents weekend	1.095	1273797.70	426924.36
NASCAR weekend	1.324	3154146.60	420969.47
Income Tax week	1.072	-805805.83	321643.58
Memorial weekend	1.032	2437032.20	414458.64
July 4 weekend	1.043	2164507.20	416669.11
March 11	1.286	456029.64	919035.24
July 30	1.080	339237.22	842129.63
Trend	1.302	-2380.89	1035.315
Rake	2.388	98.63	39.08
AR(1)		0.48	0.08

Note. [a] Variance inflation factor. * All betas significant at .05; $p<.05$.

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The variables shown in Table 4 posted significant and positive effects at the .05 alpha level. VIF's were low for the majority of the model variables, indicating that problematic multicollinearity was not present. The autoregressive term, AR(1), was needed to remove the first-period serial correlation in the error process. Without AR(1), the model coefficients would include bias resulting from dependent error terms.

Multiple Regression Analysis Assumptions & Diagnostics

Model results were examined for violations of optimum least squares (OLS) regression assumptions. Scatter-plots of the predicted y-values provided no evidence of nonlinearity or heteroscedasticity. Histograms failed to indicate a problematic departure from normal distribution.

A correlogram (see Figure 5) was examined to detect serial correlation in the error process. When found, the appropriate autoregressive terms were added to the models until the serial correlation was removed. The term is labeled "AR" in the regression output table.

The most serious problem with time series data is serial correlation. At 36 lags, no signs were identified. A review of a residual scatter plot, featuring studentized deleted residuals and adjusted predicted values, indicated no problematic heteroscedasticity or curvilinearity. Multicollionearity was analyzed via variance inflation factors as shown in Table 4. The residual histogram failed to indicate the presence of problematic outliers in the final models.

Sample: 2/03/2005 8/11/2005
Included observations: 190
   Q-statistic
   probabilities
   adjusted for 2
   ARMA term(s)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|.	.|.	1	-0.007	-0.007	0.0103	
.|.	.|.	2	-0.017	-0.017	0.0632	
.|.	.|.	3	0.020	0.020	0.1397	0.709
.|.	.|.	4	0.044	0.044	0.5256	0.769
.|.	.|.	5	-0.003	-0.002	0.5279	0.913
.|.	.|.	6	-0.013	-0.012	0.5605	0.967
*|.	*|.	7	-0.074	-0.077	1.6616	0.894
.|.	.|.	8	-0.050	-0.054	2.1627	0.904
.|*	.|*	9	0.098	0.097	4.1014	0.768
.|.	.|.	10	0.024	0.030	4.2214	0.837
*|.	*|.	11	-0.108	-0.098	6.5834	0.680
.|.	.|.	12	-0.052	-0.055	7.1307	0.713
.|.	.|.	13	0.050	0.037	7.6556	0.744
*|.	*|.	14	-0.096	-0.102	9.5669	0.654
.|.	.|.	15	-0.047	-0.044	10.022	0.692
*|.	*|.	16	-0.069	-0.059	11.026	0.684
.|.	.|.	17	0.026	0.036	11.164	0.741
.|.	.|.	18	0.000	-0.014	11.164	0.799
.|.	.|.	19	0.011	-0.007	11.188	0.847
*|.	*|.	20	-0.092	-0.076	12.992	0.792
.|.	.|.	21	-0.022	-0.023	13.096	0.834
.|.	.|.	22	0.001	-0.036	13.096	0.873
.|.	.|.	23	0.010	0.005	13.117	0.904
*|.	.|.	24	-0.060	-0.040	13.912	0.905
.|.	.|.	25	0.048	0.053	14.430	0.914
.|*	.|*	26	0.091	0.070	16.253	0.879
.|.	.|.	27	0.057	0.042	16.992	0.882
.|.	.|.	28	0.002	-0.017	16.993	0.909
*|.	*|.	29	-0.086	-0.091	18.672	0.882
*|.	*|.	30	-0.094	-0.124	20.697	0.838
.|.	*|.	31	-0.047	-0.076	21.195	0.852
.|.	.|.	32	-0.038	-0.055	21.536	0.870
.|.	.|.	33	-0.044	-0.005	21.981	0.884
.|*	.|*	34	0.111	0.127	24.861	0.812
.|*	.|*	35	0.081	0.075	26.403	0.785
.|.	.|.	36	-0.007	-0.040	26.415	0.820

Figure 5. Correlogram examining serial correlation of residuals.

A residual histogram is shown in Figure 6. A graphic review of the deleted

residuals failed to indicate the presence of problematic outliers in the final models.

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While there are a few variables that appear to be outliers, they are within three standard deviations of the mean. A final test run on the data was a scatter-plot residual by Coin-in. A review of a residual scatter plot, featuring deleted studentized residuals and adjusted predicted values, indicated no problematic heteroscedasticity.

Figure 6. Histogram of residuals.

Series: Residuals	
Sample 2/03/2005 8/11/2005	
Observations 190	
Mean	-6.80E-08
Median	-70903.07
Maximum	1760369.
Minimum	-2008006.
Std. Dev.	625472.6
Skewness	0.231487
Kurtosis	3.439649
Jarque-Bera	3.227123
Probability	0.199177

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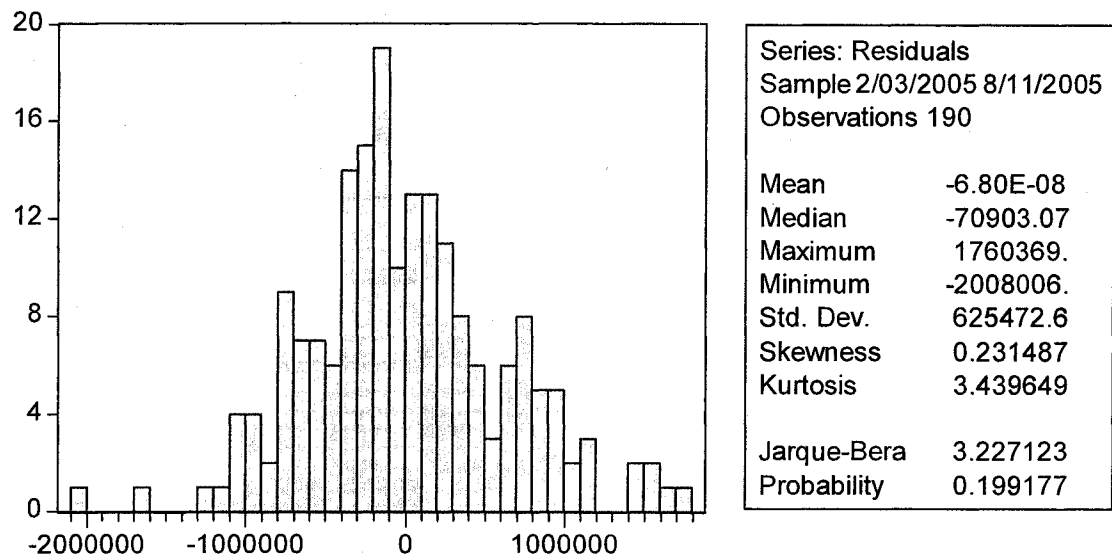
CHAPTER V

DISCUSSION

Managerial Implications

The outcome of the current study does support the plausibility of the full-service model, with regard to the poker assumption. Specifically, the results produced evidence of a positive, indirect poker effect. Although incremental table-game revenue was not estimated in this study, the Las Vegas Strip casino that provided this data is oriented toward slot customers, rather than table-game customers, as a principle source of sales. Therefore the existence of a significant, positive, higher-order correlation between poker-room rake and slot coin-in is good news for operators. Casino managers will want to consider this relationship when deciding on the allocation of valuable floor-space for poker facilities.

The positive indirect poker effect is seen in the beta of the independent variable poker rake. Beta (Rake) is equal to 98.63 (see table 4), which Approximates 100. This can be interpreted as saying that each $1 in Rake produced $100 coin-in. Assuming a par valuation of .075 (a reasonable assumption of average house advantage for a Las Vegas Strip property), the casino in this study would see $7.50 Incremental Win from each $1 of rake. Assuming a 0.75 slot-operations profit margin, this same $1 in rake would yield a $5.63 Cash Flow (EBITDA in normal casino accounting).

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The math above demonstrates that poker room volume is a peripheral driver of slot revenue. But, that insight alone does not mean that poker rooms are a better use of available floor space than a typical assortment of slot machines.

Whenever managers are making decisions about the direct or indirect contributions of various gaming and amenity options, they must attempt to maximize the profit-per-square-foot. As Lucas points out in his Bingo analysis (Lucas, Dunn, & Kharitonova, 2006), profit-per-square-foot must never be confused with activities or customers per square foot. Poker rooms have the potential to attract many customers. But Lucas reminds us that not all customers are the same in terms of potential profitability. Although poker satisfies a need, as evidenced by its popularity and its ability to fill rooms in a casino, it may be a suboptimal choice from the standpoint of key stakeholders and property cash flows.

Because slot operations have relatively low labor costs and generate strong revenues due to the high number of outcomes-per-hour, even a small amount of play on a marginally-popular slot machine assortment might generate stronger cash flows than the flows connected to a poker room. Because of the characteristics of a destination market, nearly all Las Vegas Strip casinos experience revenue and customer traffic peaks during weekends and holidays, and they also see troughs during midweek periods. Although poker rooms are able to deliver customers during slow periods, property profits may be increased by having extra slot capacity in place for customers during the peak periods. This counterintuitive reality is related to the unlikely scenario of management being able to quickly convert the available space back and forth between slots and poker.

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Although poker shows a statistically significant benefit to slot operations, the economic benefit is still only marginally positive and thus it is difficult to effectively argue that productive slot space should be converted into poker space, even though this is now the trend on the Las Vegas Strip. This argument assumes that poker rooms are used for a conventional mix of cash games and tournaments. Theoretically, management could come up with a creative way to extract greater direct revenue from poker room customers, but an in-depth look at this possibility is beyond the scope of this paper and should be a subject for future research.

Following the format of Lucas' Bingo analysis (Lucas et al., 2006), managers must ask: What would be the impact to slot revenue if the property closed its poker room? Would the casino lose all slot play from its former poker clientele? Would it retain some of this play? If so, how much? All of these questions depend on the local competition. Lucas suggests that combination players (in this case, those who play both live poker and slots) might still visit this venue as a destination choice if no other options are available. However, in the event of choice (clearly the situation on The Strip), one would expect decreased patronage from this group following the closure of the poker room. In any situation, management will have to weigh the alternatives and attempt to find the optimal decision on a case-by-case basis, factoring in different potential cash-flows, branding strategies, and short- and long-term strategic goals.

Profit per Square Foot

Any casino management team interested in maximizing profit-per-square-foot should find the results of this study valuable. Specifically, these results show that

although poker room volume is a statistically significant driver of slot coin-in, the economic significance is marginal. It is difficult to make the case that a poker room is the best use of floor space for this property. Although further study is needed to determine if a particular slot mix in that very space might make a greater impact to the bottom line than the current poker set-up, it seems likely that any reasonable slot machine configuration would be preferable to the poker tables.

General Discussion

Although this study was interested in the indirect gaming contribution of poker room operations, the researcher did notice potential areas for improving the direct contribution of poker rooms to a casino's bottom line. If management believes that poker rooms are important amenities, it might be in management's best interest to consider changes to poker-room operations that have the potential to improve profitability.

One change might be to establish a reasonable fee for beverages in the poker room. Some California poker-room operators already do this, but no Las Vegas casinos are currently moving in this direction. This idea is grounded in the assumption that the poker room is an amenity, similar to a theatrical showroom. Drinks in Las Vegas slot and table-game areas are complementary. However, in the showrooms or at the swimming pool areas, guests must pay for their beverages. If poker rooms are truly amenities, and do not offer significant direct economic benefit to the casino, it does not seem unreasonable to charge for drinks in this situation. Naturally, competitive pressures may make operators hesitant to do this near the Las Vegas Strip. But no empirical research has established that customers would be resistant to such a change.

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Many customers already pay for drinks at casino bars without hesitation, even though they could easily sit in front of the slot machines only a few feet from a given bar area and not be required to pay for the same beverages. The willingness of California poker players to pay for drinks at the poker rooms in their state suggests that Las Vegas casino guests (a significant number of which are California residents) may also be willing to pay for beverages. This change could benefit Las Vegas poker room operators and others who are not already benefiting from beverage sales.

Another possible improvement to poker room profitability could come from modest facility charges. The poker room could charge each player a small one-time fee for sitting down at the table. Although this might seem like an aggressive action that would generate significant customer resistance, there has been no empirical research on this topic. It is not out of the realm of possibility that players would just shrug off the charge and demonstrate price-inelastic demand behaviors that benefit the casino operator. Until an operator tests this idea, it will not be possible to determine if money is being left on the table by poker room operators.

Poker customers may also be getting over-comped by the casinos. Most Las Vegas Strip casinos offer comps in the form of dollar credits that can be used for free food, sundries, and other services. Comps generally range from $1-$3 per hour of tracked poker play. This casino perk may not be needed to sustain player interest in a given poker room. This belief is suggested by the existence of some Las Vegas poker rooms (including the room at the Flamingo, as of November, 2006) that are able to sustain relatively busy rooms with no comp offerings.

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Perhaps the most promising method of improving poker-room bottom lines will come from the technology arena. Electronic poker tables that eliminate the need for human poker dealers offer many advantages. These tables may speed up the game, generating more hands-per-hour and higher rake revenues. Since machines do not needed to be tipped, players save money (normally, most players tip dealers on a winning hand) and these players may be more willing to pay a facility fee as a result. These machines also eliminate payout mistakes and reduce player misbehavior (including string bets) that can potentially bring games to an extended halt.

Players who are used to online poker should find electronic live tables to be a natural extension of their normal poker environment. However, it is possible that players will be resistant to the electronic systems, since these systems do eliminate some of the interesting nuances of normal live table action. Only by testing these machines in a casino environment will it be possible to determine the viability of this alternative.

This general discussion represents the researcher's sense that the direct contribution of poker rooms may be more easily improved than has previously been assumed. However, these ideas are offered to operators as food for thought, and are only indirectly related to the purpose of this paper. This paper is interested in the indirect contribution of poker rooms, and the following section will address some of the limitations of this study.

Limitations

The most obvious limitation of this research is the fact that the data originate from a single casino property. As such, it is unlikely that the results are generalizable.

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Nonetheless, the results will help management at this particular property, and they provide a starting place for looking at the issues surrounding the decision to operate a poker room. Future research will help to build industry knowledge on this subject. When other properties are studied, it will be possible to see these results within the context of more generalized casino operations. It is possible that in different markets, such as a repeater market or even another destination market in an isolated location (such as a tropical island with monopoly characteristics), results would be substantially different.

This paper also did not look at the effect of poker room volume on table-game play. It is quite possible that this effect is similar to or greater than slot-revenue impact. It is unfortunate that the table drop metric does not provide enough information to allow a specific analysis of this potential relationship.

Future Research

Theoretically, management could come up with a creative way to extract greater direct revenue from poker room customers. A researcher might ask: Can direct poker-room revenues be increased by some other sequence of charges? One possibility might be to charge for drinks in the poker room or to extract other concessions from players. Competitive pressures may demonstrate that this will not work, but if demand for this product proves to be highly elastic, the casino could see improved profitability.

The replication of this study at a different property would provide a clear benefit to the industry's decision makers. It would also be useful to conduct observation studies of poker clientele to determine specifics about their actual gaming behaviors. Qualitative

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studies using ZMET and other sophisticated interview methodologies would also be

beneficial to scholars and practitioners.

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