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Seeking Value or Entertainment? The Evolution of Nevada Slot Hold, 1992-2009, and the Slot Players' Experience

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Since the advent of the current economic decline, speculation about the impact of “tighter” slot machines on gaming revenues and visitation patterns has been rife. Indeed, it is easy to make an intuitive link between higher slot hold percentages—that ultimately make the slot playing experience either shorter in duration or more costly, or both—and declines in revenue, handle, and visitation. But examining the slot hold percentages and slot denomination mix in the context of the changes in slot technologies over the years 1992 to 2009, it becomes apparent that there was no sudden arbitrary decision by slot managers to increase hold percentages. Instead, players have chosen, in increasing numbers, to play higher-hold, lower denomination machines in place of lower-hold, higher denomination ones. Player choice, not managerial initiative, has been the key determinant of higher slot holds in Nevada, and this pattern likely holds across the national industry.

Keywords: Gaming, slot machine, slot hold percentage, Las Vegas Strip, Boulder Strip, Nevada

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Introduction

In the winter of 2009/10, Las Vegas casino operators find themselves in dire straits. Within the past two years, a global financial crisis has triggered a recession that is deeper—and already longer—than any decline the industry has previously seen. With fewer visitors coming to Las Vegas, and those who do come spending less, many casinos are confronting a “new normal” of

diminished revenues and lowered expectations.

Scanning the online comments section of the two major Las Vegas newspapers as the decline continues, one finds a simple, and seemingly quite sensible, explanation for the drop. A contingent of commenters insists that it isn't just the bad economy that is keeping gamblers away—it is the greed of

casino operators. By “tightening up” slot machines, i.e., increasing the slot hold, they have maximized their profits in the short run, but ruined the gambling experience in the long run. An online reader with the screen-name “lightfoot” summed up the argument in a comment on a July, 31, 2009 *Las Vegas Sun* news story about slot hold percentages:

People talk about 6:5 payouts on blackjack and tight slots. It never used to feel like they wanted to take your money as fast as they could. It does now.... [It's] like spending \$100 to bowl all weekend in a tournament versus spending \$100 to bowl a single game. One might be fun. The other, not so much.¹

Players have long been claiming that, in the good old days, slots were loose and players were treated better. It may be human nature to look at the past through rose-colored glasses. Yet to those who've seen their dollars buy them less time on slot machines, the “tight slots ruined Las Vegas” argument seems to hold water.

Examining the actual slot hold data, however, yields some trends that suggest there is much more to the story than gluttonous and inept casino bosses. Slot hold has in fact increased since about 1993 with little direct relation to increasing or decreasing numbers of visitors, number of machines, or revenue. Instead, the key factors influencing the rise of slot hold are mostly likely the widespread adoption of convenience-enhancing and game-speeding technologies and a shift in player preference towards lower-denomination, higher-hold machines. In the end, those most responsible for rising hold percentages are the players themselves.

What is slot hold?

Casinos make money by offering gamblers the chance to win money at negative expectation games. A player may come out ahead at any single gambling session, but over the long haul, gamblers lose

more than they win. Any casino game that does not have a negative expectation poses a serious financial liability for a casino.

Most table games, like craps, roulette, and blackjack, have a negative expectation because of a discrepancy between the true chances of winnings and the odds offered players. For example, the pass line bet at craps pays even money, but the player has about a 48.6 percent chance of winning it. That 1.4 percent divergence between the odds and the payout is the house advantage.

Slot machines have a similar edge for the house. Called the theoretical win or theoretical hold percentage, this number, unlike the hold for table games with constant rules, can fluctuate. When slot machines were predominantly mechanical devices in which the player pulled a lever that set reels into motion, slot mechanics adjusted the hold percentage of games by adding and removing symbol from reel strips. More symbols meant a greater chance to win, while fewer meant a smaller proportion of hits.

With the advent of games controlled by EP-ROMs, slots were liberated from the physical limitations of reels. Using a random number generator, the top jackpot could be programmed to hit (on average) much less frequently than a random spin of three wheels would permit, allowing for much larger top jackpots. Yet the same principle remained: in order to make money, casinos had to offer slot machines that paid back, in total, less than they took in.

The slot hold percentages is the portion of monies played that the house retains. Depending on the denomination and type of game, average slot hold varies greatly. Changing the slot hold is one of the ways that casino managers can adjust their “prices” to attract players or maximize revenues.

The *Gaming Revenue Report*, issued monthly by the Nevada Gaming Control Board, records the total average slot hold of a reporting area as its “win percentage.” This is merely the term for the actual percentage of the amount of money inserted in all the reporting area’s slot machine that the casinos retained.

In industry parlance, slot holds range from “loose” to “tight,” with loose slots having lower win percentages (for casinos) and tight slots having higher ones. This informal characterization is completely subjective: there is no agreed-upon point that represents the divergence between a “loose” and “tight” slot, no formal divide between profitability for casinos and opportunity for players. What is held to be “tight” in one jurisdiction might be considered “loose” in another.

One of the chief vectors on which slot hold varies is denomination. In general, the higher the denomination, the lower the slot hold percentage. Nevada statewide results for 2009 show the pattern:²

Denom	Win%
1 cent	10.10
5 cent	6.96
25 cent	5.79
1 dollar	5.26

In this example, the hold for “penny” slots is nearly double that for “dollar” slot machines. This isn’t because dollar slot machines are less expensive to make than pennies, but, in theory, because the pennies, with smaller amounts wagered, need a higher “takeout” to make them equally profitable. In practice, however, amount played per spin on low denominations can equal and even eclipse that of higher denominations. This is one of the major factors in the gradual upward creep of slot hold percentage over the past fifteen years.

In addition, some categories of slots, such as full-pay video poker machines, have extremely low hold percentages, while others, like Megabucks and other wide area jackpots, have relatively high hold percentages. The latter games offer a life-changing jackpot—often running into the millions—as an incentive to play while the former, though they generally lack such stupendous payouts, are unparalleled time-fillers. Other slots fill the range between these two extremes. As recorded in the *Gaming Revenue Reports*, there are no distinctions between video poker and reel slots, though Megabucks machines have their own total.

The geographic variance of slot hold: General trends

In addition to its variance among denominations, slot hold varies widely across Nevada and within individual counties. Generally speaking, the more heavily geared towards “unsophisticated,” non-habitual tourist traffic a reporting area is, the higher its slot win percentage. This is seen, in microcosm, inside Clark County. Using the twelve-month average for 2002 as an example, since it falls within the middle of the period considered in this study and is typical in its distribution, the seven reporting areas in Clark County can be arranged as follows:³

Area	Av. Hold
Las Vegas Strip	6.18%
Laughlin	5.88%
Downtown LV	5.61%
Mesquite	5.30%
Boulder Strip	4.64%
Bal. of County	4.60%
North LV	4.53%

These average slot hold percentages neatly prove the supposition that casinos that draw more “tourists” than “locals” have tighter machines.

The Las Vegas Strip caters to a mix of serious gamblers, leisure travelers, business travelers, and the merely curious. Many of those who fall into the latter three groups have a small, set gambling budget and are more entranced by the novelty of the experience than time-on-device. There are many, many more of them than there are of “serious” gamblers who look for games with extremely low negative (or positive) expectations. In 2008, the average gambling budget for Las Vegas visitors was \$531.98, with only 22 percent of gamblers “spending” more than \$600 dollars per trip. The average gambler played for 3.3 hours per day.⁴ The vast majority (86 percent) of those visiting Las Vegas play on the Strip, and they visited, on average three different casinos to gamble.⁵

Laughlin is geared primarily towards retirees who may be steady slot players who are more sensitive to shorter time-on-device but are similarly attracted to novelty in play

at the expense of time-on-device. In 2008, all of respondents surveyed reported that they gambling while in Laughlin (compared to only 85 percent in Las Vegas); they spent significantly more time (an average of 5.8 hours per day) playing than Las Vegas visitors, though their average gambling budget was only slightly higher, at \$556.32. Compared to their Las Vegas counterparts, Laughlin visitors were somewhat sedentary, gambling at an average of only 1.6 different casinos per visit.⁶

Downtown Las Vegas attracts a bargain-seeking clientele, and its casinos, which are generally within a few steps of each other, are more sensitive to competitive pressure than Strip or Laughlin casinos, which are not usually as easy to get in and out of. A slot-player at a downtown casino who believes his machine is stingy can simply get up and walk across the pedestrian-friendly street, perhaps enjoying a free overhead show along the way. It is harder for visitors to some Strip casinos to get from one end of the property to the other, let alone to pull up stakes and head for a new casino.

Mesquite has a similarly price-driven constituency, but with less competition (one company owns three of the four casino hotels in town) and greater distances between properties than downtown Las Vegas. Though one might expect to see higher slot holds in Mesquite, the city's casinos endeavor to attract Las Vegas locals who are accustomed to the more generous (for the player) machines found outside of the tourist corridor. This destination is a bridge between the "tourist" and "locals" reporting areas.

The slot hold in reporting areas dominated by locals casinos—the Boulder Strip, North Las Vegas, and the balance of Clark County—were, in 2002, within one tenth of one percent of each other. This is in line with the traditional distribution, and further reflects the fact that these areas have much more in common with each other than the "tourist" zones. What works on the Strip might not work in downtown or Mesquite, but Las Vegas locals casinos, from Craig Road

to Boulder Highway, are generally in competition for the same customers.

Local Las Vegas slot-players tend to favor video poker, whose optimum payback schedules are considerably more generous than the expected payback for most non-video slots. In addition, these patrons are, by their very nature, repeat customers, who have very clear expectations of what their slot-playing experience should be like. The tourist who puts twenty dollars in a slot machine twice a year—or once every five years—is not as sensitive to an increase in hold percentages as a weekly slot player. Factoring in the easy availability of other gambling options, from restricted-license pubs and taverns to other locals casinos, it is easy to see why locals play on slot machines that are, on average, about 25 percent "looser" than those of the Strip.

Variation over Time

The general pattern of slot hold percentage distribution has remained fairly static over the last eighteen years, but there has been a notable upward shift in the average hold across the board.

There is a plethora of data on the progression of slot hold averages over the period under study. It is entirely possible to note the trends in each of the twenty-five reporting areas of the Gaming Revenue Report. For the purposes of this study, however, we will look at three reporting areas only: the statewide average, which gives a sense of the entire state; the Las Vegas Strip, which is by far the largest market in the state and the quintessential tourist-oriented one; and the Boulder Strip, which has been a bulwark of the locals market for three decades.

Examining both the Las Vegas and Boulder Strips, as well as the statewide average, allows for a distinction between trends that are driven by larger, pan-industry factors, such as technological change, and those peculiar to a particular clientele.

For the period 1992-2009, one might consider 1993 the golden year for Las Vegas slot players. In that year, the machines of the

Strip held an average 5.46 percent of all money played, and those of the Boulder Strip retained a paltry 3.38 percent. This is the lowest figure in each reporting area for the era in question. Though the statewide total dipped from just over 5 percent in that year to 4.91 percent in 1996, both the Las Vegas and Boulder Strip figures were higher (nearly half a percentage point higher in the case of the latter).

Generally, slot hold percentages have steadily climbed since 1992, with a few bumps and dips. For the state as a whole, 1992 saw an average hold of 5.12 percent, and steadily declined for the next four years. In 1997, the hold percentage began to rise significantly: from 1996 (4.91 percent) to 2008 (6.16 percent) the average Nevada slot machine became more than twenty-five percent tighter.

The Las Vegas Strip saw an even greater increase, rising from a 1993 low of 5.46 percent to 7.09 percent in 2009, a bump of nearly thirty percent. Yet this advance pales in comparison with the Boulder Strip's boost in hold percentage, which was proportionally nearly twice as dramatic, rising from 3.38 percent in 1993 to 5.35 percent in 2007, an overall increase of over 58 percent. Lowered holds in 2008 and 2009 somewhat mitigated this stratospheric rise, but the increase is striking nonetheless.

The increase is steady enough and significant enough to rule out statistical variances due to chance. Clearly, slot machines have, over the past decade, been returning less and less to the patrons who play them.

Why a creep upwards

Those with a generally dim view of casino executives, seeing the rise in slot hold percentage, might rejoice in having found at last proof of the overweening greed of those who own and manage casinos. Examining the concurrent changes in slot mix, however, reveals a more complex picture. In fact, two inter-related factors have led to the rise in slot hold: new technologies and shifting player preferences.

First, slot machines themselves have changed tremendously in the years that this study examines. In 1991, the typical slot machine accepted between three and five coins per spin; players pulled on a manual handle to set the reels into motion (hence the designation "one-armed bandit"); patrons inserted coins before each spin, and coins clattered happily into the tray in the event of a win. Whether it was two coins, two hundred, or a manual hand-pay, players saw real money after each winning combination. Before he started playing, a patron needed a steady supply of coins. To this end, casinos had both stationary change booths and roving change-people who exchanged coins for cash.

This began to change in the 1990s with two related developments. First, the introduction of the credit meter meant that players now had the option of letting winning credits accrue on their machine instead of rattling out as coins. This sped up play considerably, which likely accounted for some of the increase in hold percentage; as players were able to cycle money from wins through the machine more quickly, they played more. Seeing wins as figures on an LED display rather than feeling them as the weight of solid coins may have also encouraged looser play on the part of patrons, leading to higher holds for casinos.

The second major advance soon followed. With the coin bottleneck at the end of the slot play cycle removed, it only remained to free the player from coins at its beginning. Starting in the middle of the decade, bill validators began to permit players to insert bills directly into a machine (or a retro-fitted accessory) and convert them into credits. This cut out a time-consuming and inconvenient step from the slot playing process and further abstracted the experience: now, players simply inserted a bill, received credits, and did not see "real" coins until they cashed out.

A further innovation circa 2003 accelerated the process begun by credit meters and bill validators. The advent of "cashless gaming" or "ticket in/ticket out" player cut coins out of the slot equation

entirely. Now, players inserted bills into their slot machines, played off credits, and received a ticket when “cashing out” that could be inserted into another machine or exchanged for cash at a cashier or redemption booth.

Looking at the migration of slot hold percentages for quarter machines statewide demonstrates the impact of these new technologies on game hold. In the early 1990s, the average hold bounced between 5.15% and 5.20%. Yet once bill validators began to gain traction—and players became more comfortable with playing credit meters—machines statewide began holding a higher percentage of coins played. From a 1995 baseline of 5.15%, the hold percentage climbs rapidly from 1996 to 1999, then steadies at a median level of 5.5% percent for the next four years. In 2004, when ticket-in/ticket out machines were beginning to be widely installed, the hold percentage jumped again, to 5.9%, and continued to soar upward as coins disappeared: in 2007, the average Nevada quarter machine slot hold was 6.43%, about a full percentage point higher than a decade earlier. The trend is less pronounced on nickel machines, but equally, if not more, present for penny and dollar slots. Slot machines of the same denomination have, for the most part, become tighter over the past decade, most likely for the reasons outlined above.

The three new technologies described above facilitated a shift in players’ preferences towards smaller denominations, which is the second major reason for the rise in average slot hold. As described above, lower denomination machines typically have higher hold percentages than higher one.

Starting in the 1990s, Americans began turning to multi-line, multi-credit slots already popular in Australia. Initially, nickels were the denomination of choice. In 1997, when the transition began in earnest, less than 22 percent of all Nevada slots were nickels. The percentage of nickels continued to rise until it crested at 33 percent in 2001: in that year, more than one out of every three slots in Nevada casinos was a nickel machine. Since nickels had an average hold of about 2

percent higher than quarters, which they tended to replace, this contributed to the overall rise in Nevada statewide slot hold from 4.98 percent to 5.50 percent over the same period.

The widespread adoption of ticket in/ticket out technology spurred the even more explosive growth of penny slot machines. From 1994 to 2003, there were not sufficient numbers of penny slots in the state to merit a separate reporting line; they were simply lumped in with other oddball denominations as “other.” But in 2004, pennies resurfaced, with more than twelve thousand machines statewide—nearly 7 percent of the total installed base. By 2008, more than twenty percent of all Nevada slots were pennies. Since the slot hold for pennies has averaged around 10 percent since their resurgence, this has also notably lifted overall slot hold numbers. In 2004, the state average for all casino slots was 5.72 percent; in 2008, it was 6.16 percent, the highest total on record.

In 1996, when the statewide slot hold average was 4.91 percent, the average “cost” of \$100 in play was a little less than five dollars. This dry mathematical average, however, doesn’t do justice to the actual player experience, so some conjectures are in order. Let’s imagine a casino patron playing the maximum three quarter bet on, say, a Double Diamonds three-reel slot. They are betting 75 cents per spin, and probably averaging ten spins a minute, which means that, each minute they play, they are betting \$7.50. An hour of plays means \$450 cycled through the machine. In that year, the average quarter machine had a hold of 5.18%. An hour of slot play, then, would cost the player \$23.31.

A hundred dollars could give them about 4.3 hours of time playing time, on average. Factoring in a less-than-robotic ten spins per minute pace and time out for bathroom breaks or waiting for slot attendants to fill empty hoppers or hand-pay a big jackpot, you get an even longer time on device: this is easily a night’s entertainment for someone who likes playing slots.

By 2009, however, after the introduction of “convenience” technologies that placed addition barriers between the player and hard cash, and facilitated the introduction of lower denomination, higher hold machine, the average hold for all Nevada casino slots is 6.10 percent. At first blush, this seems like a paltry 1.18% increase. That’s the total arithmetic increase, true, but proportionally, it’s a nearly 24 percent increase. With the growing prevalence of lower-denomination, higher-hold, higher-bet games, the change is quite apparent. There are more penny machines (39,491) than any other denomination (excepting for the moment multi-denomination games, which take anything from a penny to five dollars per credit), so pennies can well explain the current typical slot experience.

There’s no standard on a maximum bet for a penny machine, since they can have dozens of paylines with dozens of credits bet on each. For the purposes of a quick demonstration, we’ll take a machine with an average max bet of 200 credits., which is actually quite conservative; many popular penny slots allow the player to bet as many as 500 credits per spin.

Each spin, then, costs \$2.00. That’s \$20.00 a minute cycling through the machine, and \$1,200 an hour. The average statewide hold for pennies was 10.10% in 2008, so the average “cost” per hour of penny slot play is \$121.20.

The same hundred dollars that could buy a player, on average, more than four hours of entertainment in 1996 would get them barely 45 minutes of time on device in 2009. Factoring in less down time because of ticket-in ticket out technologies (no hopper fills), and quicker play because of push-buttons probably would give the player even less time with that \$100 bill. If players want to get anything close to a fully-functional playing experience on multi-line machines, their time on device will be significantly lower than had they been playing quarters.

That players would so overwhelmingly choose to play machines with higher hold seems counter-intuitive, but it is apparently

true. Remember that in 2003, there were so few penny machines in the state that the *Nevada Gaming Revenue Report* just lumped them into the “other” category.⁷ Five years later, one in five slots in Nevada casinos was a penny slot. Casinos wouldn’t replace 20% of their slot inventory with pennies unless people were playing them at rates well above other denominations.

Pennies are likely so popular because they have greater entertainment value—a game like WMS’s *Star Trek* line that offers numerous bonus rounds, video clips, and “sensory immersion” just blows Double Diamonds out of the water, particularly for novice or occasional gamblers. In addition, casual gamblers can play at minimal levels, thus prolonging their playing time while limiting their chances at a major jackpot. As penny slot player “Jeff in OKC” said response to a post on www.dieiscast.com:

I know I am going to lose, and lose more quickly on a penny machine, but I can get more time on a penny machine than almost any other for the same money (except single payline quarter machines—dull). My purpose playing the penny machines is to lose as slowly as possible, for the least possible, and get entertained when I’m losing.⁸

Clearly not a strategy for winning or extracting the maximum advantage from a negative expectation game, this approach nonetheless allows players to gamble at low stakes with a modicum of entertainment—a sensible notion, perhaps, for casual players.

But even “serious” locals gamblers have migrated to lower denomination games; in fact, in 2009, an even higher percentage of slots were high-hold pennies on the Boulder Strip (25.87%) than the Las Vegas Strip (20.69%). So it isn’t just gullible tourists drawn to the fancy bells and whistles of machines that no seasoned gambler would touch. Experienced locals too are drawn to the more exciting new games.

Thus, it should be clear that the rising hold percentages in Nevada casinos are likely not due to casino managers arbitrarily tightening their machines. The upward creep of average slot hold percentages statewide, in both tourist and locals markets, is instead the result of new technologies making slot play quicker and less burdensome, and the increasing popularity of lower denomination games.

From 1992 (5.56%) to 2007 (6.92%), slot hold on the Las Vegas Strip rose 1.36 percentage points, or a total increase of 24.5 percent. The Boulder Strip in the same years saw a jump from 3.44 percent to 5.35 percent, a total of 1.91 percentage points, or 55.5 percent. While the slot hold on the Boulder Strip remained well below the Strip total, in both absolute and proportional terms local slot players accepted a greater increase in slot hold and a corresponding decrease in either their returns or their time on device than “unsophisticated” tourist gamblers in the mega resorts of the Strip.

Examining year to year variations in the total money wagered on slot machines, or handle, can help gauge the response of slot players to lowered hold percentages. If the handle rises when hold is lowered, the hypothesis that players play more on looser slots can be proven.

Figure 1 (appendix) contains data for the number of slots, total win, hold percentage, and total play (handle) for the calendar years 2000 to 2009 for all non-restricted casino locations in the state of Nevada. As can be seen, hold percentages rose consistently throughout the period. Win rose less steadily, nearly holding steady from 2000 to 2002, followed by impressive increases from 2003 to 2006, leveling in 2007, and returning to 2005 levels in 2008, with a slight dip in the following year. The handle followed a similar pattern, falling from 2000 to 2002, rising from 2003 to 2006, falling slightly in 2007, plunging in 2008, and dropping again in 2009. Neither correlates directly to hold percentage. The data for the Las Vegas Strip and Boulder Strip show a similar pattern for

the period in question, with less striking though still-present declines.

Indeed, the only sure relationship seems to be that as the number of slots decreases, hold increases; both moved in opposite directions independent of the handle and win trend. Correlation, however, does not necessarily suggest causation, and it is likely that the apparent statistical link between these two variables is without any causative link.

Reaction to the Recession

As of the summer of 2007, it seemed that players would continue to accept escalating slot holds as the cost of more entertaining, more convenient slot play. But as storm clouds were gathering that would soon cast a pall on the tourist and locals markets. What impact would these newly-adverse conditions, and patrons’ supposed new sensitivity to cost and value, have on slot hold?

Since late 2007, visitor volume and gaming revenue have consistently fallen. Many “observers” of the casino milieu insisted that a return to plentiful food, cheap rooms, and loose slots would abate the decline. Indeed, this strategy is not without its merits, and virtually every casino has lowered room rates, sacrificing average daily rate for occupancy. And casino managers have long believed that players will respond positively to high expectation games on the floor. In 1998, Stardust casino manager Alan Abrams summed up the traditional approach by remarking that “any game that’s too strong for the house won’t last. If players lose their money in five minutes they won’t be happy. They want to have fun, they want value for their money, and we want them to have value.”⁹

Yet this effort to appeal to bargain seekers has not, apparently, extended to loosening slot machines by any perceptible margin. Since the 4th quarter of 2007, slot hold statewide has fluctuated slightly, with a tiny net decline, going from 6.08% in the fourth quarter of 2007 to 5.93% in the fourth quarter of 2009. The Strip actually saw a raise

in hold percentage, from 6.73% to 6.82%. The Boulder Strip saw a more notable decline from 5.35% to 4.94%. The result is that slots are paying back better for locals than they were two years ago, and slightly worse for tourists. There is no evidence of a concerted effort by casino owners to either lower slot hold to attract players seeking time on device, or raise slot hold to maximize their revenues from a shrinking player base.

Conclusion

Slot machine hold percentages on both the tourist and locals markets in Nevada have significantly increased over the past fifteen years. They did so primarily for two reasons. The first is the introduction of new technologies such as credit meters, bill validators, and ticket in/ticket out gaming that both increased the tempo of slot-playing and removed the feel of “real” money from the process—an intangible but important factor. These technologies facilitated the second major reason for the upward migration of Nevada slot hold, the shift towards lower-denomination, higher-hold machines.

The growing dominance of these machines in the period under study, combined with the seemingly inexorable upward climb of slot hold percentages, suggests that higher slot hold averages are more a result of consumer choice than manipulation by casino managers. Increasingly, players are opting for lower-denomination, higher hold machines that place a premium on entertainment value over expected payback or time on device. As long as casino patrons continue to pass by better-paying but less exciting machines on their way to visually stimulating lower-denomination games, the trend will continue.

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Appendix: Data Sets and Figures

Data Set 1: Slot hold percentage: Annual averages, 1992-2008

From 1992-2001, Boulder figure is from locations reporting more than \$1 million in revenues. All other figures are for all non-restricted locations in the reporting area.

1992			2001		
State	Strip	Boulder	State	Strip	Boulder
5.12	5.56	3.44	5.33	6.09	4.55
1993			2002		
State	Strip	Boulder	State	Strip	Boulder
5.02	5.46	3.38	5.44	6.18	4.64
1994			2003		
State	Strip	Boulder	State	Strip	Boulder
4.97	5.49	3.46	5.50	6.26	4.62
1995			2004		
State	Strip	Boulder	State	Strip	Boulder
4.95	5.55	3.75	5.72	6.52	4.86
1996			2005		
State	Strip	Boulder	State	Strip	Boulder
4.91	5.53	3.90	5.84	6.56	5.03
1997			2006		
State	Strip	Boulder	State	Strip	Boulder
4.98	5.67	4.09	6.02	6.82	5.24
1998			2007		
State	Strip	Boulder	State	Strip	Boulder
5.11	5.92	4.26	6.12	6.92	5.35
1999			2008		
State	Strip	Boulder	State	Strip	Boulder
5.20	6.02	4.34	6.16	7.03	5.20
2000			2009		
State	Strip	Boulder	State	Strip	Boulder
5.23	6.02	4.43	6.10	7.09	5.07

Data Set 2: Statewide Slot Mix, 1992-2009

1992: 136,145 slots, 5.12% win percentage

1 cent	162	.11%	13.06
5 cent	31,245	22.94%	8.86
25 cent	72,577	53.30%	5.20
1 dollar	27,258	20.02%	4.47
Other	4,903	3.60%	--

1993: 147,174 slots, 5.02% win percentage

1 cent	161	.10%	11.23
5 cent	32,272	21.92%	8.60
25 cent	76,980	52.30%	5.15
1 dollar	30,032	20.40%	4.36
Other	7,729	5.25%	--

1994: 156,837 slots, 4.97% win percentage

1 cent	169	.10%	10.81
5 cent	34,573	22.04%	8.45
25 cent	85,146	54.28%	5.19
1 dollar	30,998	19.76%	4.13
Other	5,951	3.79%	--

1995: 164,625 slots, 4.95% win percentage

5 cent	36,156	21.96%	8.23
25 cent	89,281	54.23%	5.15
1 dollar	32,613	19.81%	4.33
Other	6,575	3.99%	--

1996: 172,636 slots, 4.91% win percentage

5 cent	36,971	21.41%	8.09
25 cent	93,985	54.41%	5.18
1 dollar	34,182	19.80%	4.25
Other	7,498	4.34%	--

1997: 177,020 slots, 4.98% win percentage

5 cent	38,454	21.64%	7.80
25 cent	95,269	53.81%	5.30
1 dollar	34,888	19.7%	4.25
Other	8,409	4.75%	--

1998: 180,062 slots, 5.11% win percentage

5 cent	42,302	23.49%	7.38
25 cent	93,287	51.80%	5.37
1 dollar	34,742	19.29%	4.30
Other	9,731	5.40%	--

1999: 187,306 slots, 5.20% win percentage

5 cent	49,743	26.55%	7.14
25 cent	91,621	48.91%	5.46
1 dollar	34,648	18.49%	4.43
Other	11,294	6.02%	--

2000: 192,844 slots, 5.23% win percentage

5 cent	59,573	30.89%	7.18
25 cent	86,089	44.61%	5.40
1 dollar	33,718	17.48%	4.41
Other	14,004	7.26%	--

2001: 195,999 slots, 5.33% win percentage

5 cent	66,578	33.96%	7.20
25 cent	79,698	40.66%	5.42
1 dollar	32,245	16.69%	4.51
Other	17,478	8.91%	--

2002: 186,430 slots, 5.44% win percentage

5 cent	56,639	30.38%	7.83
25 cent	68,125	36.54%	5.58
1 dollar	28,883	15.49%	4.64
M-Deno	20,877	11.19%	4.47
Other	11,906	6.38%	--

2003: 184,266 slots, 5.50% win percentage

5 cent	51,728	28.07%	7.89
25 cent	62,579	33.96%	5.51
1 dollar	26,759	14.50%	4.67
M-Deno	27,930	15.15%	4.81
Other	15,270	8.28%	--

2004: 178,980 slots, 5.72% win percentage

1 cent	12,115	6.79%	8.99
5 cent	29,731	16.61%	8.12
25 cent	51,622	28.84%	5.90
1 dollar	23,357	13.05%	4.85
M-Deno	43,535	24.32%	5.01
Other	18,620	10.40%	--

2005: 177,886 slots, 5.84% win percentage

1 cent	19,861	11.16%	9.31
5 cent	26,827	15.08%	8.39
25 cent	41,153	23.13%	6.25
1 dollar	20,259	11.38%	5.01
M-Deno	62,159	34.94%	5.04
Other	7,627	4.28%	--

2006: 177,356 slots, 6.02% win percentage

1 cent	25,708	14.49%	9.89
5 cent	18,451	10.40%	8.25
25 cent	32,068	18.08%	6.39
1 dollar	17,696	9.97%	5.20
M-Deno	76,273	43.00%	5.28
Other	7,160	4.03%	--

2007: 174,677 slots, 6.13% win percentage

1 cent	32,220	18.44%	10.10
5 cent	14,187	8.12%	8.48
25 cent	25,911	14.83%	6.43
1 dollar	15,927	9.11%	5.52
M-Deno	80,098	45.85%	5.21
Other	6,334	3.62%	--

2008: 171,693 slots, 6.16% win percentage

1 cent	35,842	20.87%	10.22
5 cent	10,973	6.39%	7.99
25 cent	21,633	12.59%	6.11
1 dollar	14,411	8.39%	5.41
M-Deno	83,245	48.48%	5.24
Other	5,589	3.25%	--

2009: 169,872 slots, 6.10% win percentage

1 cent	39,491	23.24%	10.10
5 cent	8,442	4.96%	6.96
25 cent	17,806	10.48%	5.79
1 dollar	12,830	7.55%	5.16
M-Deno	86,421	50.87%	5.19
Other	4,881	2.87%	--

Data Set 3: Las Vegas Strip Slot Mix, 1992-2008

1992: 41,836 slots, 5.56% win percentage

5 cent	6,980	16.68%	10.82
25 cent	23,978	57.31%	5.93
1 dollar	9,236	22.07%	4.86
Other	1,642	3.92%	--

1993: 49,568 slots, 5.46% win percentage

5 cent	7,522	20.40%	10.69
25 cent	28,223	56.93%	5.86
1 dollar	11,564	23.32%	4.73
Other	2,259	4.55%	--

1994: 49,704 slots, 5.49% win percentage

5 cent	7,471	15.03%	10.69
25 cent	28,767	54.28%	6.11
1 dollar	11,212	22.55%	4.75
Other	2,254	4.53%	--

1995: 51,027 slots, 5.55% win percentage

5 cent	7,781	15.24%	10.56
25 cent	29,250	57.32%	6.19
1 dollar	11,400	22.34%	4.81
Other	25,96	5.08%	--

1996: 52,659 slots 5.53% win percentage

5 cent	7,674	14.57%	10.65
25 cent	30,042	57.05%	6.32
1 dollar	11,828	22.46%	4.75
Other	3,115	6.10%	--

1997: 53,672 slots, 5.67% win percentage

5 cent	7,374	13.73%	10.58
25 cent	30,402	56.64%	6.62
1 dollar	12,303	22.92%	5.00
Other	4,068	7.57%	--

1998: 55,581 slots, 5.92% win percentage

5 cent	8,187	14.72%	9.78
25 cent	30,607	55.05%	6.90
1 dollar	12,768	22.97%	4.91
Other	4,019	7.23%	--

1999: 60,169 slots, 6.02% win percentage

5 cent	10,036	16.67%	9.38
25 cent	32,104	53.35%	7.13
1 dollar	13,640	22.66%	5.07
Other	4,389	7.29%	--

2000: 61,433 slots, 6.02% win percentage

5 cent	12,651	20.59%	8.84
25 cent	29,872	48.62%	7.14
1 dollar	13,647	22.21%	5.20
Other	5,263	8.56%	--

2001: 61,867 slots, 6.09% win percentage

5 cent	15,008	24.25%	8.70
25 cent	28,079	45.48%	7.20
1 dollar	13,113	21.25%	5.21
Other	5,667	9.15%	--

2002: 58,930 slots, 6.18% win percentage

5 cent	13,624	23.11%	9.57
25 cent	24,469	41.52%	7.43
1 dollar	11,928	20.24%	5.30
M-Deno	4,483	7.60%	3.92
Other	4,426	7.51%	--

2003: 57,548 slots, 6.26% win percentage

5 cent	12,795	22.23%	9.74
25 cent	22,432	38.97%	7.57
1 dollar	10,840	18.83%	5.47
M-Deno	6,116	10.62%	4.44
Other	5,365	9.32%	--

2004: 56,035 slots, 6.52% win percentage

1 cent	2,526	4.50	9.94
5 cent	11,091	19.79%	10.15
25 cent	19,637	35.04%	7.82
1 dollar	9,581	17.09%	5.62
M-Deno	9,368	16.71%	5.24
Other	3,832	6.83%	--

2005: 55,448 slots, 6.56% win percentage

1 cent	4,358	7.85%	10.38
5 cent	8,078	14.56%	10.42
25 cent	16,741	30.19%	8.09
1 dollar	8,749	15.77%	5.74
M-Deno	13,873	25.01%	5.37
Other	3,649	6.58%	--

2006: 52,372 slots, 6.82% win percentage

1 cent	5,779	11.03%	10.94
5 cent	5,220	9.96%	10.81
25 cent	12,351	23.58%	8.51
1 dollar	7,381	14.09%	6.21
M-Deno	18,305	34.95%	5.87
Other	3,336	6.36%	--

2007: 49,891 slots, 6.92% win percentage

1 cent	6,984	13.99%	11.40
5 cent	4,307	8.63%	11.60
25 cent	9,900	19.84%	8.87
1 dollar	6,459	12.94%	6.73
M-Deno	19,290	38.66%	5.63
Other	2,951	5.91%	--

2008: 50,158 slots, 7.03% win percentage

1 cent	8,829	17.60%	11.71
5 cent	3,629	7.23%	11.33
25 cent	8,634	17.21%	8.47
1 dollar	6,192	12.34%	6.57
M-Deno	20,221	40.31%	5.81
Other	2,653	5.28%	--

2009: 49,476 slots, 7.09% win percentage

1 cent	10,237	20.69%	11.60
5 cent	2,591	5.23%	10.56
25 cent	7,169	14.48%	8.18
1 dollar	5,566	11.24%	6.24
M-Deno	21,541	43.53%	5.98
Other	2,372	4.79%	--

Data Set 4: Boulder Strip Slot Mix, 1992-2008

1992: 5,726 slots, 3.40% win percentage

5 cent	1,596	27.87%	6.81
25 cent	3,185	55.62%	3.11
1 dollar	773	13.49%	3.19
Other	172	3.00%	--

1993: 6,665 slots, 3.38% win percentage

5 cent	1,939	29.09%	6.89
25 cent	3,698	55.48%	3.05
1 dollar	857	12.85%	3.37
Other	171	2.56%	--

1994: 9,814 slots, 3.46% win percentage

5 cent	2,805	28.58%	6.81
25 cent	5,486	55.89%	3.15
1 dollar	1,231	12.54%	2.85
Other	292	2.97%	--

1995: 10,660 slots, 3.75% win percentage

5 cent	3,209	30.10%	6.98
25 cent	5,766	54.09%	3.43
1 dollar	1,380	12.94%	3.19
Other	305	2.86%	--

1996: 11,638 slots 3.90% win percentage

5 cent	3,422	20.40%	6.96
25 cent	6,365	54.69%	3.65
1 dollar	1,509	12.96%	3.00
Other	342	2.93%	--

1997: 14,373 slots, 4.09% win percentage

5 cent	4,428	30.80%	6.85
25 cent	7,635	53.12%	3.80
1 dollar	1,743	12.12%	3.37
Other	567	3.94%	--

1998: 15,211 slots, 4.26% win percentage

5 cent	5,057	33.24%	6.60
25 cent	7,624	50.12%	3.83
1 dollar	1,725	11.34%	3.35
Other	805	5.29%	--

1999: 15,948 slots, 4.34% win percentage

5 cent	6,166	38.6%	6.58
25 cent	7,060	44.26%	3.79
1 dollar	1,720	10.78%	3.37
Other	1,002	6.28%	--

2000: 17,196 slots, 4.43% win percentage

5 cent	7,584	44.10%	6.71
25 cent	6,750	39.25%	3.65
1 dollar	1,742	10.13%	3.42
Other	1,120	6.51%	--

2001: 20,062 slots, 4.55% win percentage

5 cent	9,009	44.90%	6.73
25 cent	7,245	36.11%	3.69
1 dollar	2,065	10.29%	3.55
Other	1,743	8.68%	--

2002: 19,397 slots, 4.64% win percentage

5 cent	6,681	34.43%	6.65
25 cent	6,005	30.95%	3.60
1 dollar	1,700	8.76%	3.67
M-Deno	3,743	19.29%	5.18
Other	1,268	6.53%	--

2003: 19,060 slots, 4.62% win percentage

5 cent	5,929	31.10%	6.89
25 cent	5,621	29.49%	3.51
1 dollar	1,656	8.68%	3.42
M-Deno	4,082	21.41%	5.08
Other	1,772	9.29%	--

2004: 18,933 slots, 4.86% win percentage

1 cent	1,916	10.11%	8.39
5 cent	3,751	19.81%	6.59
25 cent	3,688	19.47%	3.61
1 dollar	1,366	7.21%	3.71
M-Deno	7,616	40.22%	4.95
Other	596	3.14%	--

2005: 19,050 slots, 5.03% win percentage

1 cent	2,633	13.82%	9.21
5 cent	2,054	10.78%	6.58
25 cent	2,345	12.30%	3.69
1 dollar	945	4.96%	3.83
M-Deno	10,611	55.70%	4.78
Other	462	2.42%	--

2006: 19,480 slots, 5.24% win percentage

1 cent	3,371	17.30%	9.89
5 cent	1,698	8.71%	5.71
25 cent	2,162	11.09%	3.74
1 dollar	981	5.03%	3.94
M-Deno	10,779	55.33%	4.98
Other	489	2.51%	--

2007: 20,098 slots, 5.27% win percentage

1 cent	4,380	21.79%	10.27
5 cent	1,753	8.72%	5.39
25 cent	2,498	12.42%	3.64
1 dollar	1,151	5.72%	3.95
M-Deno	9,874	49.12%	4.92
Other	442	21.06%	--

2008: 20,181 slots, 5.20% win percentage

1 cent	4,624	22.91%	10.18
5 cent	1,595	7.90%	4.70
25 cent	2,218	10.99%	3.29
1 dollar	1,018	5.04%	3.47
M-deno	10,358	51.32%	4.93
Other	368	1.82%	--

2009: 21,622 slots, 5.07% win percentage

1 cent	5,595	25.87%	9.97
5 cent	1,242	5.74%	4.76
25 cent	1,728	7.99%	3.32
1 dollar	938	4.33%	3.59
M-deno	11,767	54.42%	4.50
Other	353	1.63%	--

Data Set 5: Slot hold: Geographical Variations

For all non-restricted locations, taken from December 2002 Gaming Revenue Report; win percentage for 12-month period

Statewide: 5.44

Carson Valley: 5.16

Churchill County: 4.93

Clark County (overall): 5.53

Clark County (downtown LV): 5.61

Clark County (LV Strip): 6.18

Clark County (North LV): 4.53

Clark County (Laughlin): 5.88

Clark County (Boulder Strip Area): 4.64

Clark County (Mesquite): 5.30

Clark County (Balance of County): 4.60

Douglas County (South Shore Lake Tahoe): 5.77

Elko County: 5.19

Elko County (Wendover): 4.50

Elko County (Balance of County): 6.25

Humboldt County: 5.92

Lyon County: 5.77

Nye County: 5.50

Washoe County: 4.96

Washoe County (Reno): 4.98

Washoe County (Sparks): 4.65

Washoe County (North Shore Lake Tahoe): 5.38

Washoe County (Balance of County): 5.26

White Pine County: 4.24

Balance of Counties: 6.25

Data Set 6: 2007-2009 quarterly slot hold percentages

All data from three-month summaries, from Nevada Gaming Revenue Reports for these months.

March 2007

State	Strip	Boulder
6.07	7.00	5.10

June 2007

State	Strip	Boulder
6.17	6.94	5.32

September 2007

State	Strip	Boulder
6.21	7.00	5.29

December 2007

State	Strip	Boulder
6.08	6.73	5.35

March 2008

State	Strip	Boulder
6.31	7.24	5.18

June 2008

State	Strip	Boulder
6.20	7.01	5.46

September 2008

State	Strip	Boulder
6.24	7.10	5.30

December 2008

State	Strip	Boulder
5.88	6.63	4.89

March 2009

State	Strip	Boulder
6.21	7.37	5.01

June 2009

State	Strip	Boulder
6.02	7.01	4.96

September 2009

State	Strip	Boulder
6.21	7.15	5.25

December 2009

State	Strip	Boulder
5.93	6.82	4.94

Figure 1

Annual totals, slot win, hold percentage, and handle.
Nevada Statewide. Add 000 to all dollar figures for totals

Year	Slots	Win	Hold%	Total Play
2000	192,844	\$6,191,018	5.23%	\$118,375,105
2001	195,999	\$6,198,699	5.33%	\$116,298,292
2002	186,430	\$6,273,531	5.44%	\$115,322,261
2003	184,266	\$6,476,859	5.50%	\$117,761,072
2004	178,980	\$7,098,524	5.72%	\$124,100,069
2005	177,886	\$7,767,528	5.84%	\$133,005,616
2006	177,356	\$8,306,103	6.02%	\$137,975,132
2007	174,677	\$8,450,908	6.13%	\$137,861,468
2008	171,693	\$7,736,005	6.16%	\$125,584,496
2009	169,872	\$6,823,039	6.10%	\$111,853,098

Figure 2

Annual totals, slot win, hold percentage, and handle.
Las Vegas Strip Add 000 to all dollar figures for totals

Year	Slots	Win	Hold%	Total Play
2000	61,433	\$2,380,945	6.02%	\$39,550,581
2001	61,867	\$2,393,837	6.09%	\$39,307,668
2002	58,930	\$2,439,802	6.18%	\$39,478,996
2003	57,548	\$2,558,574	6.26%	\$40,871,789
2004	56,035	\$2,864,537	6.52%	\$43,934,616
2005	55,448	\$3,171,258	6.56%	\$48,342,347
2006	52,372	\$3,435,441	6.82%	\$50,373,035
2007	49,891	\$3,502,322	6.92%	\$50,611,589
2008	50,158	\$3,214,871	7.03%	\$45,730,739
2009	49,476	\$2,808,617	7.09%	\$39,613,779

Figure 3

Annual totals, slot win, hold percentage, and handle.
Boulder Strip. Add 000 to all dollar figures for totals

Year	Slots	Win	Hold%	Total Play
2000	17,196	\$517,145	4.43%	\$11,673,702
2001	20,062	\$528,347	4.55%	\$11,612,021
2002	19,397	\$570,189	4.64%	\$12,288,556
2003	19,060	\$595,998	4.62%	\$12,900,389
2004	18,933	\$684,500	4.86%	\$14,084,362
2005	19,050	\$770,688	5.03%	\$15,321,829
2006	19,480	\$802,538	5.24%	\$15,315,610
2007	20,098	\$801,156	5.27%	\$15,202,201
2008	20,181	\$728,614	5.20%	\$14,011,807
2009	21,622	\$684,350	5.07%	\$13,498,027

Figure 5

Win per unit, statewide slot machines, by denomination					
Year	1 cent	5 cent	25 cent	Dollar	Multi
2000	--	\$25,073.64	\$28,636.38	\$44,317.27	--
2001	--	\$25,983.65	\$28,518.58	\$43,303.79	--
2002	--	\$27,119.01	\$29,767.85	\$44,192.50	\$36,058.05
2003	--	\$27,798.17	\$30,851.88	\$46,095.22	\$37,858.93
2004	\$40,676.59	\$30,839.64	\$34,607.76	\$50,773.98	\$40,675.54
2005	\$47,881.42	\$30,999.55	\$36,666.12	\$54,419.02	\$44,197.15
2006	\$50,668.27	\$31,054.08	\$39,397.49	\$58,203.09	\$45,693.82
2007	\$50,622.87	\$34,644.81	\$41,563.93	\$62,426.34	\$45,061.24
2008	\$49,745.68	\$33,176.34	\$38,880.22	\$54,245.29	\$42,067.78
2009	\$46,224.83	\$28,237.85	\$35,056.16	\$44,861.02	\$37,611.18

Notes

¹ Richard N. Velotta. "Marketers: Reduce slot hold to attract more customers. Las Vegas Sun, July 31, 2009. Accessed online at: <http://www.lasvegassun.com/news/2009/jul/31/marketers-reduce-slot-hold-attract-more-customers/>.

² 2008 *Gaming Revenue Report*. Carson City: Nevada Gaming Control Board, 2009.

³ 2002 *Gaming Revenue Report*. Carson City: Nevada Gaming Control Board, 2003.

⁴ 2008 *Las Vegas Visitor Profile Study*. Prepared for the Las Vegas Visitors and Convention Authority by GLS Research. 61, 65.

⁵ 2008 *Las Vegas Visitor Profile Study*. Prepared for the Las Vegas Visitors and Convention Authority by GLS Research. 64, 67.

⁶ 2008 *Laughlin Visitor Profile Study*. Prepared for the Las Vegas Visitors and Convention Authority by GLS Research. 64, 67.

⁷ 2003 *Gaming Revenue Report*. Carson City: Nevada Gaming Control Board, 2004.

⁸ Quoted on <http://www.dieiscast.com/2010/02/23/penny-slots-most-profitable-in-09/>, February 25, 2010.

⁹ Dan Emerson. "Green Felt Jungle Revisited." *Casino Executive Magazine*, v 4, n 4. April 1998. 40.