

There are More Ways to Beat the Casino than Across the Felted Tables

By Bill Zender

Many casino executives forget just how fragile our mathematical edge is over the players. Changes in rules, procedures, and promotions can render a game or customer non-profitable. This situation has occurred since the legalization of gaming in the State of Nevada in 1931, and has continued right into the new millennium. Just recently, everyone in gaming became aware of a player named Don Johnson who connived casinos in Atlantic City into a number of concessions that he claimed reversed the tables in his favor. Is this situation uncommon, or is it common enough to be a continuing threat to the casino bankroll?

Casino executives need to know the mathematics behind the games, side wagers, and marketing promotions. If the casino has no one capable at calculating the effect of changes to proposed rules, coupon offerings, bonus situations, and various other marketing tools, it's wise to outsource in order to obtain this crucial information. Many members of management are reluctant to do so. Why? Because they are afraid that admitting their lack of knowledge regarding numbers and statistical analysis makes them look "weak", and lacking in ability. Others feel they don't need to spend the money. In both of these situations, the casino is placing its operation in jeopardy of losing money, big money. Their lack of seeking the facts will cost their casino operation more revenue than the cheating and theft they spend so much capital on trying to prevent.

This situation isn't new. Back in the 50's and 60's, Las Vegas was the playground for a professional gambler known as "Nick the Greek". Nicholas Andreas Dandolos (1887-1966) was a true gambler, and won and lost millions during his seventy odd years as a professional player. Nick played all games, but especially loved blackjack. In the days before books on card counting and basic strategy, Nick knew enough about the game to play close to break even on the popular single deck games offered in the casinos in those days. Nick once commented, "If I could claim the dealer made a mistake once an hour, I had the edge". Nick was correct. While playing very close to the perfect strategy, if Nick could get the casino to push or pay one extra bet an hour, he could create a long-term edge over the house. The casino, attempting to retain Nick's "high roller" play, would happily accommodate him with these concessions, and unknowingly play into Nick's game plan. Casino management did not understand the power of Nick's strategy. They felt that the game of blackjack was so mathematically "strong" for the house that they could give the player several hands an hour, and still come out ahead. Fortunately for the casino, Nick gambled at a number of games where he couldn't gain an edge, and eventually gave back everything he won.

Let's get back to the year 2011, and Don Johnson. In July, Johnson was quoted in several newspaper and magazine articles claiming that his \$10 million dollar winning streak in Atlantic City wasn't just "all luck". Johnson claims that he was able to manipulate several Boardwalk casinos into altering their rules and high limit player promotions so that he would gain a mathematical advantage over the house. In his first interviews Johnson claimed he gained an edge because he was able to get management to change their game rules in blackjack, which was only part of it. Johnson is no dummy, and he knew that Atlantic City casinos are highly competitive in their loss rebate program, and loss rebate programs are inherently very fragile.

If a casino wanted Don Johnson's play, they had to give him a 20% rebate on his losses. This is a huge break. In addition, Johnson negotiated a loss limit of \$500,000 before he could receive a rebate, and had the table limit in blackjack raised to \$100,000. For these privileges, Johnson would place \$1 million

dollars on deposit in the casino cage. What the casinos didn't realize is the combination of rule changes and the modified rebate terms actually gave Johnson a slight edge over the casino.

If Johnson accepted the standard rules and terms for loss rebate, things wouldn't have been so juicy. Using a more common rebate 15% of loss after three months (3,000 hands) of play, and with the standard blackjack rules (basic H/A of 0.42% plus average high limit player error factor estimated at 0.4%), the "standard deal" reduces the casino theoretical win and adjusts house advantage as noted in Table 1. Based on these calculations, the casino still maintains a long-term advantage over the player.

Table 1 - Standard Deal; Average Player

Average Bet	Time Period in Hands	H/A	sd	Theo	Volatility
\$100,000	3,000	0.82%	\$6,298,809	\$2,460,000	1.15
Rebate	Loss Min	Adj H/A	Theo - Rebate	Est Rebate	Cost Rebate
15%	\$ 500,000	0.63%	\$1,900,797	\$559,203	22.73%

Note: Rebate cost calculated using standard deviation levels in tenths (+3.0 sd thru -3.0 sd).

What about Johnson's deal? First, he lowered the basic house advantage by requesting specific changes to the rules. By getting these concessions, the game's basic house advantage was reduced to approximately 0.23%. In addition, Johnson is a schooled blackjack player and plays perfect basic strategy. By making perfect hand strategy plays, the true house advantage stays at 0.23%.

Johnson's biggest and most valuable concession occurred when he got the casino to agree they would rebate his losses at 20% anytime he accumulated \$500,000 in losses, with the additional agreement that they would wipe his win/loss slate clean whenever he received the loss rebate, or with the start of new play the next day. In essences, when Johnson got ahead \$500,000 he could quit play, and start from scratch the next day, or he could lose \$500,000 and quit play receiving \$100,000 back (net loss of \$400,000).

Table 2 – Johnson's Deal

Average Bet	Time Period in Hands	H/A	sd	Theo	Volatility
\$100,000	30	0.23%	\$ 629,881	\$ 6,900	1.15
Rebate	Loss Min	Adj H/A	Theo - Rebate	Est Rebate	Cost Rebate
20%	\$ 500,000	-0.95%	\$(28,551)	\$ 35,451	513.78%

After studying Table 2, and Johnson's negotiated deal with the casinos, it's easy to see that he was smart enough to gain a nice advantage over the casino. Based on a rebate of 20% once he lost \$500,000, and a reduced H/A to 0.23% after 30 hands, Johnson could achieve an overall player advantage over the casino of approximately 0.95%. This calculation is based on a standard deviation model that requires a

specific number of hands played. Johnson had no limitation. With the ability to quit after only a few hands, could his actual player advantage even be higher?

There is more than one way to beat the casinos other than directly across the felted tables. The desire to attract the higher limit players has overcome common sense, and has been a problem for many years. With today's availability of information through assorted media, situations like this should be a thing of the past. Unfortunately, the increasing competition in the gaming market has placed more pressure on the casino marketing departments to produce. These pressures create a "rush" to attract the best and most profitable players to the casino. This increased urgency will continue to open the door to knowledgeable advantage players who will continue to extract millions of dollars from the casino's each year.