

## **Why \$5 bet at one game may not be like \$5 bet at another**

*By Alan Krigman*

Make believe you're used to betting \$1 on each of five spots at roulette. You're comfortable the way your bankroll fluctuates during a typical session – you know how big a stake gets you through normal downswings, and what comprises an acceptable session profit or loss. But this intuition doesn't serve you well betting the same \$5 at blackjack or video poker, let alone putting the whole nickel on a single number at roulette.

The same money may actually be at risk on each decision in all these cases. But the chances of winning differ, as do the payoffs. More, the games proceed at different rates so the number of bets resolved and therefore the gross wager and overall volatility in a given time span will vary. As a result, gamblers are often confident with bankrolls and bets of particular sizes under one set of circumstances, then switch bets or games and find everything's changed. Maybe for the good: making more when they're on a roll or losing less when they're cold. Or for the bad: earnings mount unexpectedly slowly when luck is smiling or losses plunge precipitously when the tide is running out.

A problem in comparing various bets is that people typically have poor intuition about probabilities. It's why the slot machine advertisements a while ago about "the next pull could make you rich" were effective. Sure, the next pull could be "it." But what was the probability of "it" being a jackpot?

The situation gets more complicated in certain games. A blackjack buff, for instance, may bet \$5 at the start of a round to win \$5 some fraction of the time. But an uncontested natural pays \$7.50. Or a hand on which a solid citizen doubles or splits will mean putting a total of \$10 or more up for grabs to strike when the iron is hot. Likewise, video poker has a range of probabilities associated with payoffs at a series of levels. How do such wagers relate to \$5 straight-up at roulette?

You can gauge disparate bets on a single measurement scale, using only dollar amounts and avoiding the puzzlement of probability. The method involves converting wagers to equivalent bet sizes and payoffs for propositions with 50-50 chances of winning. Equivalent, in the sense that house advantage and the effect of decisions on bankroll swings – the volatility – are the same.

The accompanying table gives 50-50 equivalents for \$5 bets on some common alternate propositions. The data are strictly on a bet-by-bet basis and don't account for decision rate differences.

Note two key points. 1) When the house has an edge, the usual situation, you bet more than you're paid. 2) As volatility goes up, typically evidenced by fewer but higher payoffs, the impact of the same nominal bet gets greater, for better or for worse. As an example of the latter, \$5 spread across five numbers is like risking \$12.43 to win \$11.91 while \$5 straight-up at double-zero roulette is akin to \$29.08 on a 50-50 chance to win \$28.55.

### 50-50 equivalents of representative \$5 bets

<i>proposition</i>	<i>bet</i>	<i>payoff</i>
\$5 blackjack with basic strategy (-0.4% edge)	\$ 5.67	\$ 5.63
\$5 blackjack with aggressive counting (+1.0% edge)	8.74	8.84
\$5 straight-up at 00 roulette	29.08	28.55
\$1 on each of five numbers at 00 roulette	12.43	11.91
\$5 on the five or nine at craps	6.08	5.68
\$5 on the four or 10 at craps	6.93	6.27
\$5 8/6 jacks-or-better video poker	22.16	22.00

You can calculate its 50-50 equivalent of a bet if you can determine the edge and standard deviation. The 50-50 equivalent per dollar of the original bet equals the standard deviation minus the edge expressed as a decimal (remember edge is negative when the house has the advantage). And the 50-50 equivalent payoff per dollar bet is the standard deviation plus the edge.

For Basic Strategy blackjack, edge is -0.004 and standard deviation is 1.13. So the 50-50 equivalents per dollar bet are  $\$1.13 + (-\$0.004) = \$1.134$  at risk to win  $\$1.13 - (-\$0.004) = \$1.126$ . Multiply by 5 to get the figures in the table for \$5 bet equivalents. There, wasn't that fun? At least, the versifier, Sumner A Ingmark would think so, judging from this jingle:

*How I love dispelling doubt,  
Using math to work things out.*

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