INSURE A GOOD BLACKJACK HAND?   PART I

By Marvin L. French (aka Marvin L. Master)

(From *Blackjack Forum* Volume VII #4, December 1987)

Should you insure a good blackjack hand? Blackjack gurus ridicule this question, replying that insurance is a side bet that has nothing to do with the player's hand. If more than one-third of the unseen cards are ten-valued then you insure; if fewer, you don't.

But what if the tens make up exactly one-third of the unseen cards? That makes the 2 to 1 insurance payoff exactly right, with no advantage to the casino or blackjack player. At first glance it seems that taking insurance in this case is wrong. It's like taking the odds in craps; you increase your bankroll fluctuations without any long run gain.

But wait. Let's look at the statement that the insurance bet has nothing to do with the original bet. This is not true, because correlation is involved. If you have a natural, the correlation is perfectly negative, -1.0. Whichever bet wins, the other loses. If you do not have a natural but the dealer does, then the negative correlation is also perfect: You lose the original bet and collect on the insurance. But what if neither you nor the dealer has a natural? Now the correlation between the lost insurance bet and the result of the original bet depends on the quality of your hand. If you have a 20, the correlation will be highly negative: The insurance bet is lost, and the original bet will probably win. With a 16, however, the correlation will be positive: The insurance bet loses, and the original bet will probably lose too.

These correlations lead to some interesting conclusions when there are exactly one-third tens in the deck. If you have a natural, then taking insurance should be automatic. It costs you nothing in the long run, and reduces bankroll fluctuation. If you have a 20, it seems to me that the decision should be the same. You will probably win the hand if you lose the insurance, so insuring to reduce fluctuation seems like a good idea. With a 16, however, bankroll fluctuation is increased, not decreased, by the fair insurance bet. I speculate that a player hand of 11, 19, or 20 should take the fair insurance bet, but other blackjack hands should not. Do any mathematicians out there care to comment?

INSURE A GOOD BLACKJACK HAND? PART II

By Peter A. Griffin (Professor of Mathematics and Statistics, California State University (CSU), Sacramento, CA
(From *Blackjack Forum* Volume VIII #2, December 1988)

[Ed. note: In the December issue of *Blackjack Forum* (Vol. VII #4), Marvin L. Master conjectured that if your card counting system indicated that the insurance bet was dead even, it may be advisable to insure a "good" hand, since this play would tend to reduce fluctuation. Marvin's logic is clear. If the dealer does have a blackjack, then you will lose a bet you expected to win. Taking insurance would save this bet on one third of these hands, and on those hands where the insurance bet loses, you still expect to win your initial "good" hand. Thus, bankroll fluctuations are reduced.

Here now, to lay this to rest, is Peter Griffin's final word on whether and when you should take insurance on "good" blackjack hands. More probably, this article will give nightmares to players who consider attempting to work out Griffin's insurance formula when playing. Griffin shows that it is sometimes advisable to insure good hands-in order to reduce fluctuations-even when the insurance bet has a negative expectation! Unfortunately, most dealers only allow a couple of seconds for the insurance decision. So, the simplest answer is: Marvin was right! Insure your good hands when it's a dead even bet. --*Arnold Snyder*]

[The following is by Griffin, speaking of himself in the third person]

Marvin L. Master asks the question: Should you, to reduce fluctuations, insure a good hand when precisely one third of the unplayed cards are tens?

The answer depends upon what criterion for "reducing fluctuations" has been adopted. Griffin, in his monumental epic *The Theory of Blackjack* (Huntington Press, 1988), shows that there are occasions when a Kelly proportional bettor would insure a natural with less than one third of the unplayed cards being tens. Theoretically, this criterion could also be used to analyze whether to insure 20 and other favorable holdings. However, the answer is very dependent upon both the fraction of capital bet and the distribution of the non-tens remaining in the deck.

An approximate calculation based upon what would seem a reasonable assumption in this regard suggested that 20 should be insured, but 19 not. Precise probabilities for the dealer were not computed, and the answer could well change if they were, or if a different fraction than assumed were wagered.

Another, more tractable, principle to reduce fluctuations also appears in The Theory of Blackjack: When confronted with two courses of action with identical expectations (the insurance bet here is hypothesized to neither increase nor decrease expectation), prefer that one which reduces the variance, hence average square, of the result.

This proves particularly easy to apply here. Let W, L and T stand for the probabilities of winning, losing, and tying the hand assuming insurance is not taken. In this case the average squared result is

$$ENx2 = 1 - T$$

If insurance is taken the average square becomes

$$EIx2 = 1/3\ 02 + W(1/2)2 + T(-1/2)2 + (L-1/3)(-3/2)2 = (W + T + 9L - 3)/4$$

Insurance will have a smaller average square if

$$W + T + 9L - 3 < 4 - 4T$$

Equivalently

$$W + 5T + 9L < 7$$

Or, subtracting

$$5(W + T + L) = 5$$

$$4L - 4W < 2$$

$$L - W < .5$$

$$L < W + .5$$

This will clearly be the case for player totals of 20, 19, 18, 11, 10, 9 and 8 if the dealer stands on soft 17. If the dealer hits soft 17, 18 would probably still be insurable, but not 8.

Returning to the Kelly criterion, the interested reader would be well advised to consult Joel Friedman's "Risk-Averse" card counting and basic strategy modifications. Among Joel's astute observations is that if a player confronts an absolute pick 'em hit-stand decision he should hit rather than stand. The reason is that he thereby trades an equal number of wins, (+1)2, and losses, (-1)2, for pushes, (0)2, thus reducing fluctuation.

[Note: Peter Griffin died after a short bout with cancer October 18, 1998.]