**Why You Win (or Lose) at Skins**

**Introduction** – “Skins” is a very popular golf game.  The game is simple in concept.  A group of players play a hole and if one player makes the lowest score, he wins a skin.  At the end of the round, a pool of money is divided among the players who won skin(s).  The popularity of the game derives in part from the ability of a player to win a skin even if he isn’t playing well. Skins, however, is not like a lottery where everyone has an equal chance to win.  A player’s success will depend upon 1) the Skins method (i.e., how skins are determined), 2) the distribution of handicaps among the competitors, and 3) the cap on the maximum handicap allowed.  Each of these factors is discussed in turn.

**Skins Method** – There are seven commonly used methods for playing skins:

1. *Gross Skins* – A skin is awarded only if one player has the lowest gross score on a hole.  The value of a skin is equal to the betting pool divided by the number of skins.

2. *Net Skins* – A skin is awarded only if one player has the lowest net score on a hole.[[1]](http://www.blogger.com/blogger.g?blogID=1961792768612881019" \l "_ftn1" \o ")    The value of a skin is equal to the betting pool divided by the number of skins.

3. *Net Skins Played at ½ Handicap* – This is the same as Method 2 except the player only receives one-half of his handicap.  If this results in a player having a “n +1/2” handicap, the player deducts a one-half of a stroke on the hole with a n+1 stroke allocation.  For example, a player with a handicap of 7 ½ , would get ½ stroke on the 8th handicap allocation hole. The value of a skin is equal to the betting pool divided by the number of skins.

4. *Separate Gross and Net Skins* – Gross and net skins are determined at full handicap.  The value of a gross skin is equal to half the betting pool divided by the number of gross skins.  The value of a net skin is equal to half the betting pool divided by the number of net skins.

5*. Equal Gross and Net Skins* – Gross and net Skins are determined at full handicap. The value of any skin is equal to the betting pool divided by the total number of skins.

6. *No Double Win*– This is the same as Method 5 with one exception.  A player cannot win a gross and net skin on the same hole.

7. *Net Skins, but Gross Skin Takes Precedence* – If a player has a gross skin on a hole, he is awarded a “net skin” even if other players had net scores equal to the player’s gross score.  In essence some net scores are better than others.  On closer inspection, this method is identical to Method 6 as long as a player cannot receive more than one handicap stroke on a hole.[[2]](http://www.blogger.com/blogger.g?blogID=1961792768612881019" \l "_ftn2" \o ")  Therefore, this method is eliminated from the analysis.

To examine the equity of each method a simulation model was built.  The probabilities of a 5, 10, and 15 handicap player were estimated (see Appendix).  In the first analysis, it was assumed that 5 players of each handicap level were competing. The expected return (the amount returned per dollar bet) for each group is shown in Table 1 below.

**Table 1**

**Expected Return per Dollar Bet**

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **5-Handicap** | **10-Handicap** | **15-Handicap** |
| 1. Gross Skins | $1.50 | $.97 | $.53 |
| 2. Net Skins | $.77 | $1.04 | $1.19 |
| 3. ½ Handicap | $1.18 | $.89 | $.93 |
| 4. Separate Gross and Net | $1.14 | $1.00 | $.86 |
| 5. Equal Gross and Net | $1.13 | $1.00 | $.87 |
| 6. No Double Win | $1.19 | $.92 | $.89 |

The lower-handicap player has a distinct advantage in all methods except Method 2 (Net Skins).  Methods 3, 4, 5 and 6 are essentially equivalent in terms of equity.

**Handicap Distribution** – The previous analysis had an equal number of players in each handicap group.  A player’s chances are improved if the field does not include many players with handicaps similar to his.  To demonstrate this effect, estimates of the expected return are made when there is 1 player at a handicap level and 7 players in each of the other levels.  Table 2 presents the expected return when there is only one player at the designated handicap level.

**Table 2**

**Expected Return with Only One Player at the Designated Handicap Level**

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **5-Handicap** | **10-Handicap** | **15-Handicap** |
| 1. Gross Skins | $1.97 | $1.02 | $.40 |
| 2. Net Skins | $.98 | $1.34 | $1.57 |
| 3. ½ Handicap | $1.47 | $.1.06 | $1.3 |
| 4. Separate Gross and Net | $1.48 | $1.18 | $.99 |
| 5 Equal Gross and Net | $1.49 | $1.17 | $1.03 |
| 6. No Double Win | $2.19 | $1.11 | $1.24 |

Under Method 6, for example, if there is only one 5-handicap player (instead of five) the player’s expected return jumps from $1.19 to $2.19.  This is due to the player’s birdies being more likely to win a skin when he doesn’t face competition from other 5-handicap players.

**Cap on Maximum Handicap –**In some skins games, the maximum handicap allowed is 18 or one handicap stroke per hole.  To examine the equity of this cap on handicaps, five additional players with 25-handicaps were added to the simulation model. The expected returns for each handicap level are shown in Table 3.

**Table 3**

**Expected Return per Dollar Bet**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Method** | **5-Handicap** | **10-Handicap** | **15-Handicap** | **25-Handicap** |
| 1. Gross Skins | $2.02 | $1.22 | $.68 | $.09 |
| 2. Net Skins | $.64 | $.97 | $1.29 | $1.10 |
| 3. ½ Handicap | $1.34 | $.99 | $1.10 | $.57 |
| 4. Separate Gross and Net | $1.33 | $1.09 | $.98 | $.59 |
| 5 Equal Gross and Net | $1.36 | $1.08 | $.97 | $.59 |
| 6. No Double Win | $1.41 | $1.00 | $.92 | $.67 |

As can be seen, the expected returns for 5-, 10-, and 15-handicap players have been increased with the addition of the five 25-handicap players.  The 25-handicap player does not do well under most scenarios.  It should be noted, however, that not all 25-handicaps are alike.  A 25-handicap who has a large variance in his hole scores (i.e. he has more pars and more triple bogeys than assumed in the model) will do better than Table 3 suggests.  Under reasonable assumptions about the hole-score variance of a 25-handicap player, however, it is unlikely this player will do as well as the 5-handicap player.

Method 5, No Double Win, is usually defended in terms of equity.  “A player should not get two skins for one hole,” it is argued.  Double skins, however, are most likely to go to the medium handicap player.  The elimination of double skins gives an even greater edge to the low-handicap player.  This is demonstrated in Table 4 which shows the total number of skins by handicap for the two methods.

**Table 4**

**Total Skins by Handicap (1,000 trials)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Method** | **5-Handicap** | **10-Handicap** | **15-Handicap** | **25-Handicap** |
| 5. Equal Gross and Net | 4372 | 3500 | 3112 | 1855 |
| 6. No Double Win | 3563 | 2502 | 2332 | 1698 |
|   |   |   |   |   |
| Percent Reduction in Skins | 18.5% | 28.5% | 25.1% | 8.5% |

The “No Double Win” provision eliminates a larger percentage of skins for the 10- and 15-handicap groups than it does for the 5- and 25-handicap group.  Method 6 basically shifts money to handicap groups at the extreme ends from the handicap groups in the middle. Whether this is more equitable depends upon the eye of the beholder.

**Conclusion** – Skins is golf’s mini-version of Powerball.  The odds are stacked against most players, but it is still fun to play.  Played for nominal stakes, a player should not be too concerned about his expected losses.  If a few low-handicappers are turning the weekly skins game into an annuity, however, a player should consider switching his contribution to a tax deductible charity.

**Appendix**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Score to Par** | **5-Handicap** | **10-Handicap** | **15-Handicap** | **25-Handicap** |
| -2 | .005 | .003 | .000 | .000 |
| -1 | .140 | .090 | .060 | .010 |
| 0 | .450 | .350 | .250 | .150 |
| +1 | .310 | .380 | .430 | .380 |
| +2 | .070 | .140 | .200 | .300 |
| +3 | .020 | .030 | .040 | .100 |
| +4 | .005 | .007 | .020 | .060 |

[[1]](http://www.blogger.com/blogger.g?blogID=1961792768612881019" \l "_ftnref1" \o ") If a player has a handicap less than or equal to 18, his  gross score on a hole is reduced by one stroke to obtain his net score if his handicap is less than or equal to the stroke allocation for that hole. Otherwise, his net score is equal to his gross score.

[[2]](http://www.blogger.com/blogger.g?blogID=1961792768612881019" \l "_ftnref2" \o ") Under Method 7, if a player has a gross skin, he receives a “net skin” since a gross skin takes precedence. All net skins are awarded a “net skin” unless the player also had a gross skin on that hole.  In essence, Method 7 is Method 6—gross and net skins, but a player cannot win both on a hole.

I did the following analysis just because I had the data left over from some handicap committee work done on hole handicaps.

I had line scores (gross score by hole) for 991 different rounds played on one of our courses. I also had the course handicaps of these players
at the time of the competitions (all from our regular/weekly Men's Golf
Association events). So I divided these scores into four groups by handicap. Group 1 lowest handicaps, Groups 2 next lowest, Group 3 higher, Group 4 highest handicaps. (The lowest handicap was 2 and the highest was
33.)

I then created 10,000 skins competitions by randomly selecting a player from each of the four groups (10,000 times), and I counted the number of skins won by a player from each handicap group. I didn't do "carry-overs". I just counted the number of times the Group 1 player (low handicapper) won a skin, the number of times a Group 2 player won a skin, the number of times a Group 3 player won a skin, and the number of times a Group 4 player (highest handicap) won a skin.

I repeated the whole process 3 times, first allocating 100% of handicap, next allocating 90% of handicap, and thirdly allocating 80% of the handicap. (Validating a skin was not required in my analysis).
Here are the results for the handicap allocations shown

 Group 1 Group 2 Group 3 Group 4

100% 21237 20901 22461 22042

90% 23509 21733 21781 20426

80% 25610 21138 21990 19336

This data would indicate that playing at 100% is probably right.

Notes on this data:

When 80% of handicaps are used, the low handicap group wins much more often than the other groups. The low handicappers in this case win 32.4% more skins than the highest handicappers. But they also win 21.2% more skins than the next lowest handicap group (Group 2). So, using 80% handicaps is good for the lowest handicappers, but unfair to the other three groups.

When 90% of handicaps are used, the low handicap Group 1 wins 15.1% more skins than the highest handicap Group 4.

When 100% of handicaps is used, Group 3 wins the most skins, but only by a small margin. Group 3 wins 5.7% more skins than the lowest handicappers. But this is a smaller difference than when using 90% or 80% of full handicaps.
Dave's analysis suggests that allocating less than 100% of handicap is unfair to everyone except the low handicappers.