Age and Winning Professional Golf Tournaments

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Abstract

Most professional golfers and analysts think that winning on the PGA Tour peaks when golfers are in their thirties. Rather than relying on educated guesses, we can actually use available statistical data to determine the actual ages at which golfers peak their golf game. We can also test the hypothesis that age affects winning professional golf tournaments. Using data from the websites of the Golf Channel, the PGA Tour, the European PGA Tour, and the LPGA Tour, I calculated the mean, the median, and the mode ages at which professional golfers on the PGA, European PGA, Champions, and LPGA Tours had won between 2003 and 2007. More specifically, the ages at which golfers on the PGA, European PGA, Champions, and LPGA Tours peak their wins seem to be 35, 30, 52, and 25, respectively. The regression analysis I have conducted seems to support my hypothesis that age affects winning professional golf tournaments.

KEYWORDS: golf, age, winning golf tournaments

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I. INTRODUCTION

Aging tends to decrease the flexibility, bone mass, and strength of the human body, leading to a decline in the level of physical activity of the average person (Birrer, 1989). Even professional athletes are not immune from the decline of talent due to aging. In swimming, cycling, and weightlifting, for instance, most athletes reach their prime in their 20s and early 30s (Wilmore et al., 2008). Relying on samples of 441 batters and 144 pitchers, covering the period between 1921 and 2004, Fair (2008) has empirically found that baseball batters’ and pitchers’ performances peak when they reach around the ages of 28 and 26, respectively. How about the ages at which professional golfers peak? I hypothesize that the effect of age on winning professional golf tournaments will be curvilinear; winning increases during early and prime years of golf and declines after peak ages.

The conventional wisdom about professional golfers is that they go through three consecutive phases; first, they go through the learning process, acquiring both physical and mental skills about the game. Second, after a few years of experience, they reach their prime. Lastly, due largely to physiological factors, their skills start to decline (Berry and Larkey, 1999). There is only one identifiable empirical study that has investigated such a relationship, however. Based on 489 golfers and using scoring average as the measure of performance over the course of several years, Berry and Larkey have found that most golfers, who played in the four Major championships (the Masters, U.S. Open, British Open, and the PGA), peak on average when they are between 30 and 35 years old. They, however, did not include non-Major golf tournaments in their analysis. They also did not deal with other major tours, such as the European Professional Golf Association (European PGA), the Champions, and the Ladies Professional Golf Association (LPGA) Tours. Nor did they measure golfers’ performance by number of wins.

This paper uses winning, as opposed to scoring averages, as a measure of performance and investigates the ages at which professional golfers peak their wins in both Major and non-Major golf tournaments between 2003 and 2007. The analysis also covers four major golf tours. Specifically, using data from the Golf Channel, the United States Professional Golf Association (PGA) Tour, the European PGA Tour, and the LPGA Tour, I calculated the mean, the median, and the mode ages at which professional golfers on these tours had won over a five-year period. The descriptive analyses I have conducted indicate that the ages at

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1 Morgan et al. (1999) also found that younger amateur golfers were physically more flexible than were adult and senior amateur golfers.
2 Lockwood (1999) studied the effect of aging on amateur golfers and found that amateur golfers peaked their golfing skills between the ages of 20 and 39.
which golfers peak their wins on the PGA Tour, European PGA Tour, Champions Tour, and LPGA Tour are 35, 30, 52, and 25, respectively. Moreover, the regression analyses I have conducted seem to provide support to my hypothesis that age affects winning professional golf tournaments.

II. DESCRIPTIVE ANALYSIS

A. The U.S. PGA Tour

I relied on 239 tournaments in which the U.S. PGA Tour golfers played between 2003 and 2007 to calculate the mean, the median, and the mode ages of winners. Table 1 and Figure 1a through 1d show these results. Model 1, in Table 1, shows that the mean (or average) and the median ages of winning PGA tournaments were 35.05 and 35 years, respectively. The age at which PGA Tour players’ wins peaked, the mode, was 31. Fred Funk, at 51, was the oldest winner on the PGA Tour; he won the Mayakoba Classic tournament in 2007.

It has been known for a while, however, that Tiger Woods is one of the best (if not the best) golfers to have played the game of golf. He had won 65 tournaments so far, and 27 of his wins came between 2003 and 2007. Because of this even Tiger Woods’ peers like Ernie Els think that he is well above everybody else with respect to his golf skills. In other words, if one was to analyze the skills of professional golfers, Tiger Woods’ extraordinary talent would make him a deviant or an outlier case (see also Puterman and Wittman, 2009). Several empirical studies have also reported the dominance of Woods in the PGA Tour. Using a panel dataset of 363 PGA tournaments from 1999 to 2006, Brown (2008) found that the presence of Tiger Woods in a tournament led, on average, to a decline of 0.8 strokes on a golfer’s score. Relying on a dataset consisting of 1405 golfers for the period between 1998 and 2001, Connolly and Rendelean (2009) also found that when Tiger Woods was present in a tournament, scores of other golfers, on average, declined by 0.462 strokes per round.

To observe the effect of Tiger Woods on the PGA Tour, I excluded him from the analysis shown in Model 2. As a result, the mean, the median, and the mode ages of winning PGA tournaments became 35.65, 35, and 35, respectively. The main difference between the analyses in Model 1 and Model 2 is that in the absence of Tiger Woods, the mode or the age at which tour players peak their wins increased from 31 to 35.

Another golfer who may be considered an outlier is Vijay Singh. Singh won 23 tournaments between 2003 and 2007, after he became 40 years old. When Vijay Singh is excluded from the data (while Woods is included), the mean, the median, and the mode ages became 34.36, 34, and 31, respectively. This is shown in Model 3. The main change from Model 1 is that the mean and
the median ages became smaller by about a year. And the main change from Model 2 is that the mode age decreased from 35 to 31, and this seemed to be influenced by the presence of Tiger Woods.

In Model 4, I excluded both Tiger Woods and Vijay Singh from the analysis. Interestingly, the mean, the median, and the mode ages of winning PGA tournaments became almost equal, 35 years old. When these measures are equal, the distribution of the data is said to approximate or take the form of a bell curve. Thus, we can say that about 68% of winners were within one standard deviation on each side of the mean. Since the standard deviation is 6.15, we can say that about 68% of the winners were between the ages of 29 and 41. Similarly, about 95% of the winners were within two standard deviations on each side of the mean. That is, about 95% of the winners were between the ages of 23 and 47. It seems, thus, safe to say that under normal circumstances (that is, without the presence of outlier golfers like Woods and Singh), the age at which the PGA Tour golfers peak their wins is 35. It is interesting to note that perhaps because Berry and Larkey relied only on the four Major championships (as opposed to all tournaments) and on golfers’ scoring averages (as opposed to winning tournaments), their peak years, between 30 and 35, and mine, 35, are not identical.

**Table 1: Mean, Median, and Mode Ages of Winning on the PGA Tour (2003-2007)**

|                        | Model 1   | Model 2   | Model 3   | Model 4   |
|------------------------|-----------|-----------|-----------|-----------|
| Singh & Woods          | Singh & Woods Included | Woods Excluded | Singh Excluded | Singh & Woods Excluded |
| Mean                   | 35.05     | 35.65     | 34.36     | 34.95     |
| Median                 | 35.00     | 35.00     | 34.00     | 35.00     |
| Mode                   | 31.00     | 35.00     | 31.00     | 35.00     |
Fig. 1a: PGA Tour Wins (2003-2007, both T. Woods and V. Singh included)

Fig. 1b: PGA Tour Wins (2003-2007, T. Woods & V. Singh excluded)
Fig. 1c: PGA Tour Winning Trend (2003-2007, T. Woods & V. Singh included)

Fig. 1d: PGA Tour Winning Trend (2003-2007, T. Woods & V. Singh excluded)

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B. The European PGA Tour

There were 237 tournaments in which European PGA Tour players played between 2003 and 2007. These tournaments included the World Golf Championship (WGC) events and the four majors. The mean, the median, and the mode ages of the winners were 32.50, 32, and 30, respectively. These statistics are shown in Table 2 and Figure 2a and 2b. European Tour players seem to peak their wins when they are 30 years old, which is about 5 years lower than the peak age of U.S. PGA Tour players. The mean and the median ages of winning in this tour were also smaller by about 3 years. In addition, more golfers on the European Tour had won in their twenties than in their forties. Mark O’Meara, the American, was the oldest winner on of the European PGA Tour; he won the Dubai Classic tournament at the age of 47 in 2004.

Table 2: Mean, Median, and Mode Ages of Winning on the European PGA Tour (2003-7)

|         |       |
|---------|-------|
| Mean    | 32.50 |
| Median  | 32.00 |
| Mode    | 30.00 |

C. The Champions Tour

There were 146 tournaments in which Champions Tour players played between 2003 and 2007. The mean, the median, and the mode ages of the winners were 54.21, 54, and 52, respectively. These statistics are shown in Table 3 and Figure 3a and 3b. Champions Tour golfers seem to peak their wins when they are 52 years old. Not surprisingly, winning on this Tour starts to decline very quickly as golfers are aging. Hale Irwin was the oldest winner on the tour; he won the MasterCard Championship in 2007 at the age of 62.

Table 3: Mean, Median, and Mode Ages of Winning on the Champions Tour (2003-7)

|        |     |
|--------|-----|
| Mean   | 54.21 |
| Median | 54.00 |
| Mode   | 52.00 |
**Fig. 3a: Champion Tour Wins (2003-2007)**

![Bar chart showing the number of wins by age range](image1)

**Fig. 3b: Champions Tour Winning Trend (2003-2007)**

![Line chart showing the number of wins by age](image2)
D. The LPGA Tour

There were 159 tournaments played by the LPGA Tour golfers between 2002 and 2006. These results are summarized and presented in Table 4 and Figure 4a through 4d. As shown in Model 1, the mean and the median ages of winning for women golfers were 29.90 and 30, respectively. There were two mode ages, 25 and 32, however, making the distribution of wins in the LPGA Tour bimodal (see Fig. 1c).

We also know that Annika Sorenstam has been a dominant (or outlier) player on the LPGA Tour. Indeed, the reason we have a second mode, 32, in Model 1 is mainly because Sorenstam’s 11 wins came in 2002, when she was 32. She had won over 70 tournaments so far, and 38 of them came between 2002 and 2006. Given the foregoing, I show in Model 2 the results I obtained after I excluded Sorenstam from the analysis. The mean, the median, and the mode ages of winning in this tour became 28.71, 27, and 25, respectively. Interestingly, the distribution of winning became unimodal; one of the mode ages, 25, prevailed even when Sorenstam is excluded from the analysis. The mode age, 25, which is perhaps the norm without the presence of outlier golfers like Sorenstam, is 5 and 10 years lower than the mode ages of European PGA Tour and U.S. PGA Tour players, respectively. In addition, because Sorenstam was in her thirties between 2002 and 2006, when she was excluded from the analysis, the mean and the median ages of winning for the rest of women golfers fell by about 1 and 3 years, respectively. Beth Daniel, at 47, was the oldest player to win on the LPGA Tour; she won the BMO Financial Group Canadian Women’s Open in 2003.

| Table 4: Mean, Median, and Mode Ages of Winning on the LPGA Tour (2002-2006) |
|-------------------------------------------------------------|
| Model 1 | Model 2 |
| Sorenstam Included | Sorenstam Excluded |
| Mean 29.90 | 28.71 |
| Median 30.00 | 27.00 |
| Mode 25.00, 32.00 * | 25.00 |

*Note: In strict statistical sense, we should also have two means and medians in a bimodal distribution.

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3 Because the data for 2007 were not available on the LPGA Tour web site, I included the 2002 results in order to make the analysis span over 5 years.
Fig. 4a: LPGA Tour Winning Trend (2002-2006, A. Sorenstam included)

Fig. 4b: LPGA Tour Winning Trend (2002-2006, A. Sorenstam excluded)
In sum, the descriptive analyses suggest that the ages at which golfers on the PGA Tour, the European PGA Tour, the Champions Tour, and the LPGA Tour peak their wins are 35, 30, 52, and 25, respectively.

III. REGRESSION ANALYSIS

I also ran regression analyses to test the impact of age on winning golf games in each tour. Given that the trends between age and winning tournaments (in the preceding section) seem to take an inverted-U or curvilinear shape, models that combine linear and polynomial specifications of age will likely describe the relationship between the two variables. Not surprisingly, Fair has also taken a similar approach in specifying the effect of age on baseball players’ performances. And if, indeed, the shape of winning golf games takes an inverted-U shape, the slope of the polynomial-age variable will have a negative sign. This relationship can be shown as in Eq. 1.

\[ Y = a + b_1 (X)_1 - b_2 (X^2)_2 + e \]  

(Eq. 1)

where \( Y \) = winning golf tournaments, \( a \) = the y-intercept, \( b_1 \) = the slope of the linear-age variable, \( b_2 \) = the slope of the polynomial-age variable, \( X_1 \) = the linear-age variable, \( X_2 \) = the polynomial-age variable, and \( e \) is the error term.

I show the regression results in Table 5. We have to be careful not make a lot out of the regression results since the sample sizes are less than 30 for each tour (this is because golfers who share the same birth year are combined in the analyses). In other words, the sample size in each tour is dependent on the range in the ages of the youngest and oldest winners. Nevertheless, these small-size regression analyses showed that the linear- and the polynomial-age variables are statistically significant for the U.S. PGA and European PGA Tours (see Models 1, 2, and 3). The slopes also depicted signs as expected. Model 4 and Model 5 show the analyses I conducted for the Champions and LPGA Tours, respectively. Because the polynomial-age variables were (in analyses not shown here) insignificant for both tours, I only show the results obtained from the inverse-linear models. The inverse-linear age variables are statistically significant in Model 4 and Model 5. To avoid running regression on a bimodal distribution of data, Annika Sorenstam is excluded from the analysis in Model 5.

Finally, the variances explained by the models in Table 5 are between 0.36 and 0.71. For instance, age by itself seems to explain 36% and
71% of the variations in winning tournaments on the Champions Tour and European PGA Tour, respectively.\(^5\)

| Table 5: OLS Estimates of the Impact of Age on Winning Golf Tournaments |
|---|---|---|---|---|---|
| | PGA with Woods & Singh | PGA without Woods & Singh | Euro PGA | Champion | LPGA |
| Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| \(B\) | \(B\) | \(B\) | \(B\) | \(B\) |
| Intercept | -64.46** | -48.00** | -80.13** | 91.54** | 12.61** |
| (13.07) | (13.95) | (13.85) | (18.18) | (2.25) |
| Age | 4.40** | 3.32** | 5.679** | -1.43** | -0.26** |
| (0.73) | (0.78) | (0.84) | (0.32) | (0.07) |
| Age Polynomial | -0.062** | -0.048** | -0.088** |
| (0.01) | (0.01) | (0.01) |
| \(N:\) | 28 | 28 | 26 | 12 | 26 |
| \(R^2\) | 0.66 | 0.51 | 0.71 | 0.64 | 0.36 |

Note: **: p < 0.05; Bs are unstandardized betas; standard errors in parentheses.

Using the equation of the regression line for the PGA Tour data (Eq. 2), I conducted a simulation analysis to obtain the mode age of winning. The analysis revealed that the mode age (when both Tiger Woods and Vijay Singh are excluded) was 35. This is consistent with the descriptive analysis in Part II. On the other hand, the simulation analysis I conducted for the European PGA Tour data, using Eq. 3, revealed that golfers won the most at the age of 33. This age is

\(^5\) Besides number of wins, one could use win percentages (total number of wins earned as a percentage of tournaments played) as a dependent variable. However, my analysis using the U.S. PGA Tour data for years between 2003 and 2007 (in analysis not shown here) shows that total number of wins are better indicators of achievement than are win percentages. The variances explained by total number of wins and win percentages (when both Woods and Singh were excluded) were 0.51 and 0.13, respectively. In addition, in a model that used win percentages as dependent variable, the age variables were statistically significant only at the 0.10 level.
consistent with the mean (32.5) found for the European PGA Tour in the descriptive analysis, in Part II, but it is higher than the mode age of 30. This is not surprising since in data where the mean and the mode are not identical, normal distribution is not attained, and, as a result, the OLS estimators will reveal a score more consistent with the mean.

\[ Y = -48.0 + 3.32X_1 - 0.05 (X_2)^2 \]  \hspace{1cm} (Eq. 2)

\[ Y = -80.13 - 5.68X_1 - 0.09 (X_2)^2 \]  \hspace{1cm} (Eq. 3)

In sum, the results for the PGA and European PGA Tours suggest that the impact of age on winning golf games on the two tours is curvilinear: it is positive during golfers’ prime years but becomes negative as they age (see also Berry et al., 1999). In contrast, the models describing the Champions and LPGA Tours seem to be inverse linear.

**IV. CONCLUSIONS**

Relying on descriptive analyses, I found that the ages at which the U.S. PGA Tour, European PGA Tour, Champions Tour, and LPGA Tour golfers peak their wins would be 35, 30, 52, and 25, respectively. The regression analyses I conducted seem to support the descriptive data and my hypothesis that age affects winning professional golf tournaments. It should be noted, however, that the purpose of this study was to describe and test the relationship between age and winning professional golf tournaments. However, other variables not controlled in this study could also influence winning golf tournaments. For instance, golfers’ skills, motivations, physical fitness, and practice regimens will likely play major roles on winning golf games and should be given greater import by researchers in future studies. Moreover, future studies should verify the findings of this paper by analyzing data spanning over a longer period of time.
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