PREDICTORS OF PERFORMANCE IN THE SUBSEQUENT GOLF TOURNAMENT AFTER A STRONG PERFORMANCE IN A MAJOR TOURNAMENT

Predictores de rendimiento en el siguiente torneo de golf después de un buen rendimiento en un torneo importante

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ABSTRACT: Many professional golfers have an outstanding performance in a major golf tournament, only to miss the cut in the next golf event they enter. The purpose of this paper was to determine which factors contributed to this outcome. Using the estimates of a Probit Model, it was found that the probability of missing the cut in the next tournament was reduced, the older the golfer and the fewer the number of Professional Golfers Association (PGA) career events already played in by the golfer. There was also a U-shaped relationship found between the number of days to the next event after a major tournament and the probability of missing the cut. In particular, the longer a golfer waited to enter his next tournament after success in a major (tournament), the lower was the probability of missing the cut. However, if a golfer waited too long to enter his next tournament, the probability of missing the cut increased.

KEY WORDS: Golf, PGA, cutline, Probit

RESUMEN*: Muchos golfistas profesionales tienen un desempeño sobresaliente en un torneo de golf importante, solo para pasar el corte en el próximo evento de golf al que ingresan. El propósito de este estudio fue determinar qué factores contribuyeron a este resultado. Usando las estimaciones de un Modelo Probit, se encontró que la probabilidad de perder el corte en el próximo torneo se redujo cuanto de mayor edad era el jugador de golf y menor era el número de eventos de la Asociación de Golfistas Profesionales (PGA) ya jugados por el golfista. También se encontró una relación en forma de U entre el número de días hasta el próximo evento después de un torneo importante y la probabilidad de perder el corte. En particular, cuanto más tiempo esperó un golfista para ingresar a su próximo torneo después de un éxito en un gran torneo, menor era la probabilidad de perder el corte. Sin embargo, si un golfista esperó demasiado tiempo para entrar en su próximo torneo, la probabilidad de perder el corte aumentó.*

PALABRAS CLAVE*: Golf, PGA, cutline, Probit*

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1. Introduction

Do winners celebrate their win and then become complacent with a drop in their enthusiasm to win twice in a row? As an example, a golfer may win a tournament one week and come up far short the next week. It may be due to fatigue or just the feeling that he/she has already accomplished what he/she set out to do; win. There is not as much to prove anymore and now the athlete can go out on top and sit back and relax. He/she has lost his/her edge. The same could hold for professional tennis players, swimmers, skiers, and so on. Another example is where a student may have done such a good job on his/her midterm exam that he/she ends up studying less for the final exam and does poorly on it. A university professor may get a journal article accepted in a prestigious journal and then coast for a couple of years with a significant decline in research productivity. Thus, an outstanding performance is followed by a less than stellar performance. In the area of politics, one party may win and become complacent in the next election, anticipating another win. As a result, they do not seek votes as aggressively as they did in the first election. They don't hold as many rallies and they don't send as many representatives to neighborhoods in a door-to-door grassroots campaign. Thus, they end up losing in the next election. Another example is winners of a lottery. They may end up quitting their job, wastefully spend their winnings, and end up destitute. In some cases, the winners have even been victims of crime after their names were published.

Sports psychologists have suggested that suboptimal performances by athletes may come about due to lack of concentration or motivation. After a major win for example, an athlete could lose his/her concentration and motivation to win again within a short period of time. On April 14, 2019, Tiger Woods won his fifteenth major golf championship by winning the Master's Tournament. The only golfer to win more major golf championships is Jack Nicholas with 18 career wins. The next tournament that Tiger Woods entered was the PGA Championship on May 19, 2019. He missed the cut. Other examples of top professional golfers who have done well in a major championship, only to miss the cut in the next event they played in include Jason Day who placed 5th in the Masters Tournament of 2019, but missed the cut in his next event, the Zurich Classic of New Orleans, 2019. Tony Finau and Francesco Molinari did the same as Jason Day. They both tied for 5th with Jason Day in the Masters, but missed the cut in their next tournaments. Webb Simpson placed 1st in The Players Championship in 2018, only to miss the cut in his next event, the Fort Worth Invitational, 2018. Charl Schwartzel placed 2nd in The Players Championship in 2018, but missed the cut in his next event, the Memorial Tournament in 2018.

The purpose of this paper was to determine which factors affected the continued success or failure of golfers in the Professional Golfers Association (PGA) after success in a major tournament. If those factors leading to a decrease in focus or concentration after a major win can be identified, corrective actions can be implemented by athletes. The outline of the paper is as follows. In the next section, a brief review of literature will be given, followed by a description of the model used to determine the relationships between the variables affecting golfer performance and success or failure in the next tournament. This will be followed by a section on the data, methodology and findings.

2. Literature Review

There is a large body of literature that analyzes the performance of athletes and what contributes to their successes and failures. Kellman et. al. (2018) examined the relationship between fatigue and recovery for athletes. They suggested that careful monitoring and a methodical assessment of the athlete's recovery are essential in maintaining peak athletic performance.

Shmanske (2015) has written extensively on the economics of golf. He stated, "Mean, variance, and skewness of each golfer's distribution of scores determine the golfer's earnings per tournament. But where do mean, variance, and skewness come from?" (p. 117). The author further stated, "In particular long drives and increased variance in driving accuracy each lead to increased variance in the scoring department. Meanwhile, the way to reduce variance in scoring is to hit more greens in regulation on average. However, most of the variance in scores remains unexplained (pp. 118-9)."

Afremow (2016), a sports psychologist, provides the following suggestions for athletic excellence. "1) Supreme, unwavering confidence in your abilities, 2) The ability to keep a laser-like focus when surrounded by distractions, 3) The capacity to sustain a high-level of motivation throughout a long season, 4) The strength of will to conquer all anxiety, frustration, and discouragement, and 5) the power to bring your intensity to the next level when needed (p. 1)."

Zimet (2015) discussed skills, attitudes and performance of athletes. He presented different ways people/athletes can look at a situation. Examples include: 1) "It's all about winning and losing. The whole point is to come in first place." The better thought process is "Sometimes you win and sometimes you lose, but competing is its own reward." Another example the author used is 2) "Losing is unacceptable and means the whole effort was a waste." The better thought process is "Competing offers an opportunity to challenge myself…if I never lose how can I assess my abilities and know how to improve?" (p. 1). Zimet also discussed how motivation is related to athletic performance. A high level of motivation comes about from within the athlete who has a strong love of the game and an intense desire to play and train hard.

Another body of literature dealing with athletic performance and successive events has evolved around the "hot hand" concept. First introduced by Gilovich, Vallone, and Tversky (1985), the concept states that basketball players who have a "hot hand" and are making most of their shots, will have a higher chance of making a shot after having already made a shot. The authors stated "...detailed analyses of the shooting records of the Philadelphia 76ers provided no evidence for a positive correlation between the outcomes of successive shots (p. 295)." When looking at data from free throws by the Boston Celtics basketball team from 1980 to 1981, the authors found no evidence that the outcome of the second free throw depended on the outcome of the first free throw (p. 304). On the other hand, some researchers have come out with evidence supporting the "hot hand" or "streak shooting" hypothesis. Yaari and Eisenmann (2011) used a dataset including 132,917 pairs of free throws and 1,529 triplets of free throws taken from games played in the National Basketball Association (NBA) from 2005 to 2010. The authors concluded that "Strong evidence for the existence of a "hot hand" phenomenon in free shots of NBA players were found (p. 8)." They also stated,

> We hope that this work will pave the way for studying the more important questions concerning the "hot hand" phenomenon such as what are the physiological and psychological causes for the changes in the probabilities of success and how do the players and observers perceive these indicators for good and bad periods. In particular, it will be constructive to find new examples and/or stage new experiments that will allow one to measure the timescale in which the good and bad periods alternate...the only supported example we have found in the literature that claims that there is a causal connection (dependency) between one trial and the following was from the world of Bowling...In that study, (the authors) came to a conclusion that there is dependency between trials (p. 9).

More recent work on the "hot hand" includes the paper by Miller and Sanjurjo (2018). They also concluded that the "hot hand" is not a fallacy, however, "...players may overestimate its influence and respond to strongly to it (p. 2031)."

Another study that analyzed favorable outcomes in successive athletic events was that by Rosenqvist and Skans (2015). Using data from European professional golf tournaments, they showed that success in a tournament built up the confidence of a player which led to future success in tournaments.

Haenni (2019) also analyzed outcomes in successive events. He found that losing in a tennis tournament caused the individual to wait longer to enter the next tournament. Losing to a weaker opponent had an even larger effect than losing to a better opponent. In his study, he used time to the next tournament as the dependent variable and one of his independent variables was whether the individual won or lost the match.

It may also be that the performance of an individual relative to expectations could be a driving force affecting future events. Koszegi and Rabin (2006) showed that if a taxi

driver earned less than expected in the morning, he/she would be more willing to work in the afternoon. Perhaps it is the difference between performance and expectations of performance that affects participation/performance in future events.

The purpose of this paper is to analyze some of the issues brought up by Yaari and Eisenmann (2011) in the above paragraph. What physiological or psychological causes are there for changes in the probabilities of success or failure in sports events? Also building upon the work by Rosenqvist and Skans (2015), the question of success breeding success will be further analyzed. Are there cases when success leads to complacency, fatigue, or a decrease in motivation, which hinders future performance rather than enhancing it? What distinguishes those athletes who continue to have success from those who have success followed by failure?

In the next section, a model for golfer success/failure in the next tournament after a successful major tournament will be developed, followed by a brief review of Professional Golfers Association (PGA) tournaments and data used in this study.

3. Modelling the Probability of a Golfer Missing the Cut after Success in a Major Tournament

The performance/earnings of a golfer in a golf tournament have been shown to depend on variables such as driving distance and accuracy, putting, success out of sand traps and the rough, and accuracy with irons (Shmanske, 2015). The probability that a golfer will miss the cut in the next tournament he plays in after success in a major tournament also depends on unobserved ability, which I proxy by several variables such as 1) the position he ends up in at the major golf tournament. 2) The player's official World Golf Ranking which is updated weekly. 3) The age of the golfer. 4) The number of PGA career events participated in by the player. 5) The time in days to the next golf tournament the player enters.

A higher value of the first variable, "position the golfer ends up in at the major tournament" could raise or lower the player's probability of missing the cut in the next golf tournament. A player who finishes high in the major tournament may be so elated over the win that he suffers a slight drop in his drive to repeat the performance. It may also be that he is just tired after putting in the training and mental fortitude needed to be successful in the major. On the other hand, those golfers who are very successful in a major tournament may be those golfers who are driven and cannot bear to lose. They will always find a way to try to beat the competition.

Players with a high official World Golf Ranking and just finishing a successful major tournament, would most likely make the cut in the next tournament they entered. These players are the top players in the world and there for a reason. They not only have the

physical skills to perform at their best week after week, but they also have the mental skills to quickly recover after any bad shot or bad round of golf.

Older golfers who finish high in a major golf championship may be more likely to miss the cut in the next event they play, because it may take longer for their bodies to recover. However, there are certainly exceptions to this. The oldest golfer to make the cut in the 2019 Masters Tournament was Bernhard Langer of Germany. He is 61 years of age and won the Masters Tournament in 1985 and 1993 (Shanesy, 2019). Furthermore, Bernhard Langer finished first in the Oasis Championship, 2019, and followed it up with a second place (tie), fifth place (tie), fourteenth place (tie), fifteenth place (tie), sixth place (tie) and twelfth place (tie) in successive tournaments (pgatour.com). Thus, the experience of older golfers may work in their favor to not miss the cut in the next event after a successful event.

Players with more PGA career events have the experience that comes with competing more often and have had to overcome problems associated with difficult courses, bad weather, and other adverse circumstances. This should enable them to more effectively avoid being cut in the next tournament after a successful major tournament. On the other hand, a player who constantly plays week in and week out on the PGA tour and accumulates a large number of PGA career events, could easily be tired and lack the focus to make the cut in the next event following a successful major.

The final variable, the time in days to the next event after a successful major, was expected to be nonlinearly related to the probability of missing the cut in the next event. As an example, if a golfer has more time to recover and rest from a successful major, he should do better in the next event and avoid missing the cut. However, if a golfer waits too long to enter his next tournament, he may become rusty and lose his competitive edge, thus increasing the probability of being cut.

The expected relationships between the above variables and the probability of missing the cut in the next event after a successful major are summarized in the table below.

Table 1. Modelling the probability of missing the cut in the next tournament after a successful finish in a major

Independent Variables	Expected sign
Position in the major tournament	+/ -
World Golf Rank of Player	-
Age of Golfer	+/ -
Number of career PGA events	+/ -
Time in Days to next tournament	- then +

In the next section, the major golf championships will be described. The size of the field and the cut lines will also be discussed.

4. The Major Professional Golfers Association (PGA) Tournaments

There are four major PGA golf tournaments. (1) The Masters, (2) The U.S. Open, (3) The Open Championship (formerly the British Open), and (4) The PGA Championship. They are top tournaments and it is very prestigious to win any of the four. The prize money for the tournaments is also considerable. The Masters Tournament takes place in April and is played at Augusta National Golf Club in Augusta, Georgia. The U.S. Open takes place in June and is played at different locations. The Open Championship takes place in the U.K. and is played at different courses from year-to-year. The PGA Championship takes place in May (formerly August) and is also played at different courses (Kelley, 2019).

The Masters tournament typically starts off with 70 top players. After 36 holes are played, two rounds of 18 holes, a cut is made. The Masters allows all golfers within 10 shots of the lead after 36 holes, along with those players in the top 50, to make the cut and play the final two rounds of golf. The PGA Championship, the U.S. Open Championship, and the Open Championship, start off with a field of 156 golfers. In the PGA Championship and the Open Championship, the top 70 golfers (including ties) after 36 holes, make the cut and can play the final two rounds of golf. The U.S. Open allows all golfers who place in the top 60 (including ties) to compete in the final two rounds (Kelley, 2019).

Many pro golfers also believe that the Players Championship should be considered as the fifth major golf tournament (Hazeltine National, 2014). It is a very prestigious tournament with the biggest purse of any golf tournament. Since 1982, it has been played at the TPC Sawgrass Stadium Course in Ponte Vedra Beach, Florida. The cut line is determined in a way that is similar to the Masters Tournament. The top 50 players (including ties) as well as those within 10 shots of the lead after 36 holes, are allowed to play in the final two rounds.

5. Data, Methodology and Findings

The data for final positions of the players in a tournament, age of each player, number of career PGA events, time in days to the next event participated in by each golfer, and whether a golfer made the cut in his next event, were taken from the web site, pgatour.com. The official world golf ranking of each player was taken from, www.owgr.com. If a golfer finished in the top twenty in a major golf tournament, including ties, he was considered to have a successful major tournament the way "successful major tournament" is being defined in this study. Data on individual golfers

were collected from five major championships and two Players Championships from 2018 and 2019. This resulted in 150 observations which included the top 20 players in the seven tournaments, including ties. 36 of the 150 players (24%) who were "successful" in a major tournament (a top 20 finish, including ties), missed the cut in the next tournament they entered. The dataset appears in Appendix A. The descriptive statistics of the variables used in this study are in Table 2.

Table 2. Descriptive Statistics of Variables

Variables	Mean	std dev
Position in the major tournament	10.3	6.0
World Golf Rank of Player	41.1	47.5
Age of Golfer	32.6	6.23
Number of career PGA events	198.9	125.7
Time in Days to next tournament	16.8	9.7

Since the dependent variable used in this study was a binary variable: 1 if the player missed the cut in his next tournament after finishing in the top twenty in a major tournament, and 0 otherwise, a Probit model was estimated to determine the relationships between the independent variables in Table 2 and the probability of a player missing the cut in his next tournament. The independent variable "number of days to the next event" and its squared value were entered in the model to allow for a nonlinear relationship with the probability of missing the cut in the next event.[1] The Probit model for this problem is specified in equation 1.

$$(1) \; P(y = 1|x) = \Phi(z) \equiv \int_{-\infty}^{z} \Phi(v)dv \text{ , Where } z = \beta_1 + \beta_2 X_2 + ... + \beta_k X_k$$

(Wooldridge, 2009, p. 576), where $P(y = 1|x)$ is the probability that the individual misses the cut in his next event after success in a major tournament, given a vector of independent variables, x, including 1) golfer's position in the major tournament. 2) The golfer's world golf rank. 3) The Golfer's age. 4) The number of PGA career events the golfer has entered. 5) Time in days to the next event after a successful major tournament. And 6) time in days to the next event after a successful major tournament, squared. $\Phi(z)$ is the cumulative standard normal distribution, and $\Phi(v)$ is the standard

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[1] Squared terms for age of golfer and the number of career PGA events were entered into the Probit model, but were found to be insignificant. Also, an interaction term between age and number of events, (age)x(events), was found to be insignificant as well as a variable used to capture the absolute value of the difference between the golfer's "position" in the major tournament and the golfer's world ranking, which would proxy the difference between the player's performance in the major and his expected performance. Furthermore, the above Probit model was estimated using random effects with an unbalance panel data set where the data was grouped by golfer rather than by tournament. The results were similar to those reported in Table 3

normal density.2 The maximum likelihood estimates of the parameters of the Probit model are presented in Table 3.

Table 3. Results of Estimation of the Probit Model: Dependent Variable: 1 if golfer missed the cut in the next tournament after a successful major tournament, 0 otherwise

Independent Variables	coefficent	t-stat	P-value
Constant	2.677	2.38	.017
Position in the major tournament	-.032	-1.57	.117
World Golf Rank of Player	-.0025	-.93	.352
Age of Golfer	-.083	-2.21	.027
Number of career PGA events	.0038	2.07	.038
Time in Days to next tournament	-.129	-2.35	.019
Time in Days to next tournament, squared	.0029	2.33	.020
n = 150			
36 observations with a dependent variable of 1			
Fraction of Correct Predictions = 0.75			

The results indicate that the coefficients of 1) age of the golfer, 2) number of career PGA events, 3) time in days to next tournament, and 4) time in days to next tournament, squared, were significant at the 5% level. To interpret these coefficients, the marginal effects of the independent variables were calculated with the formula in equation (2).

(2) $\frac{dP_i}{dX_j} = \Phi(z)\beta_j$, where Φ is the standard normal density

Using equation (2), the marginal effect of age of the golfer was found to be -0.024. Thus, the probability of missing the cut in the next tournament after a successful major is reduced by 2.4% for a golfer who is one year older. This is consistent with the hypothesis that older golfers have more experience and perhaps the mental skills to avoid a drop in their level of motivation after a win. The marginal effect of number of career PGA events was found to be 0.001. Thus, for every 10 additional career events played, the probability of missing the cut in the next tournament after a successful major tournament increases by 1%. This is consistent with the hypothesis that holding everything else constant, it is possible to play in too many tournaments year-in and year-out. Especially after a successful major tournament, it becomes even more difficult to perform at the highest level if a golfer has played too much without rest.

Since the variable, time in days to the next tournament, enters the Probit model in quadratic form, the value of the cumulative standard normal distribution, $\Phi(z)$, was

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[2] The Probit model can be derived from an underlying latent variable model. (Wooldridge, p. 576).

calculated for different values of "time in days to the next tournament" starting from its minimum value in the dataset, 7 days, to its highest value, 48. The estimated parameters from Table 3 were used and sample mean values of the other independent variables were used in calculating z, used in $\Phi(z)$. This will give $P(y = 1|x)$ for different values of "time in days to the next tournament." These probabilities appear in Figure 1 and Appendix B.
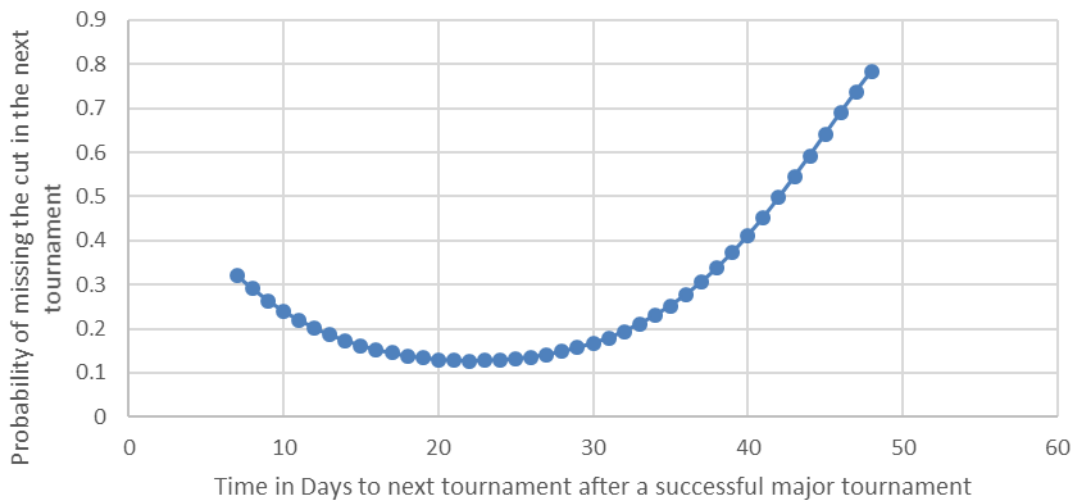
Figure 1. The effect of time in days to next tournament on probability of missing the cut in next event

These results show that for the average golfer who finishes in the top 20 in a major golf tournament, the probability of missing the cut in the next event decreases up to 22 days after the major tournament. After that, the probability of missing the cut increases, the longer the golfer waits to enter his next event. These results suggest that golfers on average, do better with up to 3 weeks off after a major tournament, before entering their next tournament. This period of recovery from physical and mental fatigue may well pay off. However, beyond the 3-week period, on average, players may lose their edge from being away from competitive golf.

6. Discussion and Conclusions

Using data from five major golf tournaments and two Players Championships from 2018 through 2019, it was found that 36 out of 150 golfers who placed in the top 20 in a major tournament (24%), failed to make the cut in the next golf tournament they entered. The purpose of this paper was to examine those factors that contributed to this. Using estimates from a Probit model, it was found that, 1) where the golfer ended up in the top 20 positions at a major golf tournament, had no significant effect on the probability of missing the cut in the next event. 2) The official world golf ranking of a player had no significant effect on the probability of missing the cut in the next event after a successful

major tournament. 3) Older golfers were less likely to miss the cut in the next tournament after a successful major. 4) A greater number of career PGA events participated in by a player was associated with a higher probability of missing the cut in the next event. And 5), the longer a player waited to enter his next tournament after a successful major tournament, the lower was the probability of missing the cut. However, if a player waited too long, the probability increased.

Results (4) and (5) above, indicate that golfers need a sufficient amount of time to recover from the physical and mental demands placed upon them by participating in major golf tournaments. Playing in less tournaments per year and taking longer to enter another tournament after a major tournament, may increase the chances of success.

There may also be some theoretical factors not captured in the above model to cause effort of players to diminish after success in a major tournament. Perhaps diminishing marginal utility of wealth leads to less of an effort put forth after just winning a good share of the tournament purse. Perhaps overconfidence on the part of the player after having success in a major tournament has something to do with poor performance in the next event. These psychological issues also need to be addressed to help athletes avoid a future loss.

In the model used for this study, time in days to the next event was used as an independent variable. However, as Haenni (2019) has shown, time in days to the next event can be further modeled as a function of several variables. Perhaps size of the purse in future tournaments as well as quality of competition could affect time in days to the next tournament. These are issues that need to be explored.

The results of this study suggest directions for future research. As an example, a trial lawyer may have just won an important case. What factors determine whether he/she will succeed or fail in the next trial? Does the age of the lawyer influence his/her continued success? Does the number of trials the lawyer has been through affect his/her continued success? Does the time in days to the next trial affect the outcome? Does the past record and reputation of the lawyer affect the future outcome? These same issues could be examined for a musician/artist. If a musician like Taylor Swift has an album that goes platinum, is there a tendency to become complacent and become less motivated to produce a successive platinum album? What factors go into this tendency to become complacent? Does it depend on the musician's age, number of albums already out, the musician's reputation, and/or the number of months until the next album is released? Probability models such as the one used in this paper may shed some light on these questions and provide the means by which the winner's curse can be avoided.

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Appendix A—Tournament Data

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
Masters Tournament-------April 11--April 14, 2019------Augusta National GC--Augusta, GA
1	Tiger Woods	12	43	353	5/19/2019--PGA Championship	35	cut
2	Dustin Johnson	2	34	252	4/21/2019--RBC Heritage	7	28
2	Xander Schauffele	10	25	70	4/21/2019--RBC Heritage	7	63
2	Brooks Koepka	4	29	116	4/28/2019--Zurich Classic of New O	14	22
5	Jason Day	14	31	244	4/28/2019--Zurich Classic of New O	14	cut
5	Webb Simpson	23	33	275	4/21/2019--RBC Heritage	7	16
5	Tony Finau	15	29	134	4/28/2019--Zurich Classic of New O	14	cut
5	Francesco Molinari	7	36	137	4/21/2019--RBC Heritage	7	cut
9	Jon Rahm	8	24	68	4/28/2019--Zurich Classic of New O	14	1
9	Patrick Cantlay	21	27	77	4/21/2019--RBC Heritage	7	3
9	Rickie Fowler	9	30	228	5/05/2019--Wells Fargo Champion	21	4
12	Bubba Watson	17	40	309	4/28/2019--Zurich Classic of New O	14	34
12	Justin Thomas	5	26	128	NA		
12	Justin Harding	49			NA		
12	Matt Kuchar	16	40	440	4/21/2019--RBC Heritage	7	2
12	Ian Poulter	32	43	265	4/21/2019--RBC Heritage	7	10
17	Aaron Wise	67	22	51	5/05/2019--Wells Fargo Champion	21	18
18	Patton Kizzire	97	33	104	4/21/2019--RBC Heritage	7	45
18	Adam Scott	29	38	313	4/28/2019-Zurich Classic of New O	14	cut
	Notes:						
	a) Official World Golf Rankings ending April 7, 2019						
	b) Career events as of May 2019						

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
The Players Championship---March 14--March 17, 2019----Ponte Vedra Beach, Fl
1	Rory McIlroy	6	30	160	3/31/2019--WGD--Dell Tech Match	14	9
2	Jim Furyk	167	49	604	3/24/2019--Valspar Championship	7	18
3	Eddie Pepperell	43	28	13	3/31/2019--WGD--Dell Tech Match	14	56
3	Jhonattan Vegas	116	34	205	3/31/2019---Corales Puntacana	14	26
5	Dustin Johnson	1	34	252	3/24/2019--Valspar Championship	7	6
5	Brandt Snedeker	57	38	324	3/24/2019--Valspar Championship	7	30
5	Tommy Fleetwood	13	28	52	3/31/2019--WGD--Dell Tech Match	14	24
8	Hideki Matsuyama	29	27	140	3/31/2019--WGD--Dell Tech Match	14	24
8	Justin Rose	2	38	332	3/31/2019--WGD--Dell Tech Match	14	9
8	Brian Harman	79	32	229	3/24/2019--Valspar Championship	7	cut
8	Jason Day	12	31	244	3/24/2019--Valspar Championship	7	cut
12	Adam Scott	32	38	313	4/14/2019--Masters Tournament	28	18
12	Joel Dahmen	183	31	65	3/24/2019--Valspar Championship	7	30
12	Abraham Ancer	63	28	68	3/31/2019--WGD--Dell Tech Match	14	17
12	Jon Rahm	10	24	68	3/24/2019--Valspar Championship	7	6
16	Nick Taylor	292	31	140	3/24/2019--Valspar Championship	7	24
16	Webb Simpson	21	33	275	3/24/2019--Valspar Championship	7	cut
16	Keegan Bradley	34	32	226	3/24/2019--Valspar Championship	7	cut
16	Ollie Schniederjans	239	25	89	3/24/2019--Valspar Championship	7	cut
20	Ryan Moore	87	36	342	3/24/2019--Valspar Championship	7	cut
20	Bryson DeChambea	5	25	83	3/31/2019--WGD--Dell Tech Match	14	40
	Notes:						
	a) Official World Golf Rankings ending March 10, 2019						
	b) Career events as of May 2019						

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
1	Brooks Koepka	4	28	104	8/26/18--Northern Trust	14	8
2	Tiger Woods	51	42	346	8/26/18--Northern Trust	14	40
3	Adam Scott	76	38	302	8/26/18--Northern Trust	14	5
4	Stewart Cink	99	45	565	8/26/18--Northern Trust	14	cut
4	Jon Rahm	7	23	55	8/26/18--Northern Trust	14	cut
6	Thomas Pieters	71	26	28	NA		
6	Francesco Molinari	6	35	128	8/26/18--Northern Trust	14	cut
6	Justin Thomas	2	25	117	8/26/18--Northern Trust	14	8
6	Gary Woodland	44	34	227	8/26/18--Northern Trust	14	48
10	Rafa Cabrera Bello	30	34	70	8/19/18--Wyndham Championship	7	11
10	Tyrell Hatton	25	26	39	8/26/18--Northern Trust	14	20
12	Jordan Spieth	8	25	150	8/26/18--Northern Trust	14	25
12	Chez Reavie	63	36	257	8/26/18--Northern Trust	14	20
12	Brandon Stone	110	25	13	NA		
12	Daniel Berger	43	25	107	8/19/18--Wyndham Championship	7	cut
12	Kevin Kisner	27	34	185	8/26/18--Northern Trust	14	73
12	Shane Lowry	88	31	81	8/19/18--Wyndham Championship	7	cut
12	Rickie Fowler	9	29	216	9/09/18--BMW Championship	28	8
19	Zach Johnson	50	42	385	8/26/18--Northern Trust	14	40
19	Kevin Na	41	35	377	8/26/18--Northern Trust	14	15
19	Jason Kokrak	122	33	186	8/19/18--Wyndham Championship	7	57
19	Justin Rose	3	38	323	8/26/18--Northern Trust	14	cut
19	Matt Wallace	75	27	4	NA		
19	Webb Simpson	20	33	262	8/19/18--Wyndham Championship	7	2
19	Julian suri	61	27	11	8/19/18--Wyndham Championship	7	41
19	Jason Day	10	30	231	8/26/18--Northern Trust	14	20

PGA Championship--August 9 to August 12, 2018---St. Louis, MO

Notes:

a) Official World Golf Rankings ending August 5, 2018

b) Career events as of September 2018

Enomoto, C. E. (2019). Predictors of performance in the subsequent golf tournament after a strong performance in a major tournament. *Journal of Sports Economics & Management, 9*(2), 65-81.

The Open Championship--July 19-22, 2018, Carnoustie GC

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
1	Francesco Molinari	15	35	125	8/05/18--World Golf Cham. Brid.	14	39
2	Justin Rose	3	38	319	8/12/18--PGA Championship	21	19
2	Rory McIlroy	8	29	146	8/05/18--World Golf Cham. Brid.	14	6
2	Kevin Kisner	33	34	182	7/29/18--RBC Canadian Open	7	cut
2	Xander Schauffele	24	24	53	8/05/18--World Golf Cham. Brid.	14	68
6	Eddie Pepperell	72	27	6	8/12/18--PGA Championship	21	59
6	Tiger Woods	71	42	342	8/05/18--World Golf Cham. Brid.	14	31
6	Kevin Chappell	61	32	215	8/05/18--World Golf Cham. Brid.	14	39
9	Tony Finau	31	28	115	7/29/18--RBC Canadian Open	7	37
9	Matt Kuchar	27	40	424	7/29/18--RBC Canadian Open	7	cut
9	Jordan Spieth	6	25	147	8/05/18--World Golf Cham. Brid.	14	60
12	Patrick Cantlay	28	26	60	8/05/18--World Golf Cham. Brid.	14	6
12	Thorbjorn Olesen	64	28	45	8/05/18--World Golf Cham. Brid.	14	3
12	Ryan Moore	81	35	325	8/12/18--PGA Championship	21	59
12	Tommy Fleetwood	10	27	37	7/29/18--RBC Canadian Open	7	6
12	Webb Simpson	21	33	258	8/05/18--World Golf Cham. Brid.	14	24
17	Jason Day	9	30	227	8/05/18--World Golf Cham. Brid.	14	10
17	Pat Perez	37	42	422	8/05/18--World Golf Cham. Brid.	14	63
17	Erik van Rooyen	144		1			
17	Charley Hoffman	34	41	360	7/29/18--RBC Canadian Open	7	29
17	Adam Scott	82	38	299	8/05/18--World Golf Cham. Brid.	14	57
17	Zach Johnson	52	42	382	8/05/18--World Golf Cham. Brid.	14	17
17	Alex Noren	11	36	49	8/05/18--World Golf Cham. Brid.	14	31
	Notes:						
	a) Official World Golf Rankings ending July 15, 2018						
	b) Career events as of August 2018						

U.S. Open--June 14-17, 2018---Shinnecock Hills Golf Course--Southampton, NY

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
1	Brooks Koepka	9	28	96	6/24/18--Travelers Championship	7	19
2	Tommy Fleetwood	12	27	33	7/22/18--The Open Championship	35	12
3	Dustin Johnson	1	34	233	7/22/18--The Open Championship	35	cut
4	Patrick Reed	13	27	172	6/24/18--Travelers Championship	7	cut
5	Tony Finau	37	28	110	7/08/18--Military Tribute--GreenB	21	21
6	Xander Schauffele	26	24	49	6/24/18--Travelers Championship	7	cut
6	Henrik Stenson	17	42	182	7/22/18--The Open Championship	35	35
6	Daniel Berger	43	25	101	6/24/18--Travelers Championship	7	67
10	Webb Simpson	21	32	253	6/24/18--Travelers Championship	7	cut
10	Justin Rose	3	37	317	7/22/18--The Open Championship	35	2
12	Russell Knox	145	33	160	6/24/18--Travelers Championship	7	38
12	Matthew Fitzpatrick	39	23	38	7/22/18--The Open Championship	35	cut
12	Zach Johnson	60	42	378	6/24/18--Travelers Championship	7	19
15	Kiradech Aphibarnr	31	28	37	7/01/18--Quicken Loans National	14	48
16	Hideki Matsuyama	10	26	118	7/22/18--The Open Championship	35	cut
16	Louis Oosthuizen	33	35	147	7/22/18--The Open Championship	35	28
16	Hao Tong Li	45	22	28	7/22/18--The Open Championship	35	39
16	Paul Casey	11	40	233	6/24/18--Travelers Championship	7	2
20	Rickie Fowler	7	29	210	7/01/18--Quicken Loans National	14	12
20	Steve Stricker	134	51	486	7/15/18--John Deere Classic	48	43
20	Charley Hoffman	36	41	356	6/24/18--Travelers Championship	7	15
20	Dylan Meyer	na					
20	Brian Gay	139	46	539	7/01/18--Quicken Loans National		8
	Notes:						
	a) Official World Golf Rankings ending June 10, 2018						
	b) Career events as of June 2018						

The Players Championship--May 10--13, 2018, Ponte Vedra Beach, FL

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
1	Webb Simpson	41	32	253	5/27/18--Fort Worth Invitational	14	cut
2	Charl Schwartzel	62	33	177	6/03/18--Memorial Tournament	21	cut
2	Jimmy Walker	83	39	300	5/20/18--AT&T Byron Nelson	7	6
2	Xander Schauffele	29	24	49	5/27/18--Fort Worth Invitational	14	cut
5	Jason Day	7	30	224	6/03/18--Memorial Tournament	21	44
5	Jason Dufner	57	41	304	5/27/18--Fort Worth Invitational	14	cut
7	Keegan Bradley	76	32	202	6/03/18--Memorial Tournament	21	23
7	Harold Varner III	199	27	83	6/10/18--FedEx St. Jude Classic	28	51
7	Tommy Fleetwood	14	27	33	6/17/18--U.S. Open	35	2
7	Danny Lee	186	27	189	5/27/18--Fort Worth Invitational	14	14
11	Brooks Koepka	11	28	96	5/27/18--Fort Worth Invitational	14	2
11	Justin Thomas	2	25	110	6/03/18--Memorial Tournament	21	8
11	Chesson Hadley	69	30	118	5/27/18--Fort Worth Invitational	14	20
11	Adam Scott	71	37	296	5/20/18--AT&T Byron Nelson	7	9
11	Ian Poulter	26	42	246	6/17/18--U.S. Open	35	25
11	Tiger Woods	92	42	338	6/03/18--Memorial Tournament	21	23
17	Alex Noren	18	35	46	6/17/18--U.S. Open	35	25
17	Jamie Lovemark	95	30	138	6/03/18--Memorial Tournament	21	37
17	Charles Howell III	61	39	518	5/20/18--AT&T Byron Nelson	7	9
17	Rafa Cabrera Bello	25	34	63	6/17/18--U.S. Open	35	36
17	Matt Kuchar	21	40	420	5/20/18--AT&T Byron Nelson	7	cut
17	Dustin Johnson	1	34	233	6/03/18--Memorial Tournament	21	8

Notes:
a) Official World Golf Rankings ending May 6, 2018
b) Career events as of June 2018

Masters Tournament----April 5-8, 2018-------Augusta, Georgia

Position	Player	Rank	Age	Events Played	Next Event	Days to next event	Position in next event
1	Patrick Reed	24	27	171	4/29/18--Zurich Classic of New Orl	21	7
2	Rickie Fowler	8	29	210	5/06/18--Well Fargo Championsh	28	21
3	Jordan Spieth	4	24	143	4/29/18--Zurich Classic of New Orl	21	cut
4	Jon Rahm	3	23	48	4/29/18--Zurich Classic of New Orl	21	cut
5	Cameron Smith	45	24	80	4/15/18--RBC Heritage	37	32
5	Bubba Watson	19	39	287	4/29/18--Zurich Classic of New Orl	21	28
5	Henrik Stenson	14	42	182	4/29/18--Zurich Classic of New Orl	21	19
5	Rory McIlroy	7	29	142	5/06/18--Well Fargo Championsh	28	16
9	Marc Leishman	16	34	240	4/15/18--RBC Heritage	37	cut
10	Tony Finau	34	28	110	4/29/18--Zurich Classic of New Orl	21	6
10	Dustin Johnson	1	34	233	4/15/18--RBC Heritage	37	16
12	Charley Hoffman	28	41	355	4/15/18--RBC Heritage	37	23
12	Louis Oosthuizen	31	35	147	4/29/18--Zurich Classic of New Orl	21	3
12	Justin Rose	5	37	317	4/29/18--Zurich Classic of New Orl	21	19
15	Paul Casey	13	40	232	4/15/18--RBC Heritage	37	cut
15	Russell Henley	53	29	147	5/06/18--Well Fargo Championsh	28	cut
17	Justin Thomas	2	25	109	4/29/18--Zurich Classic of New Orl	21	cut
17	Tommy Fleetwood	12	27	33	4/29/18--Zurich Classic of New Orl	21	4
19	Hideki Matsuyama	6	26	118	5/06/18--Well Fargo Championsh	28	76
20	Webb Simpson	41	32	252	4/15/18--RBC Heritage	37	5
20	Francesco Molinari	27	35	120	4/15/18--RBC Heritage	37	49
20	Jimmy Walker	97	39	300	4/22/18--Valero Texas Open	14	4
20	Jason Day	11	30	223	4/29/18--Zurich Classic of New Orl	21	34

Notes:
a) Official World Golf Rankings ending April 1, 2018
b) Career events as on June 2018--PGA events

Appendix B. Values of the cumulative standard normal distribution for different values for "time in days to next event"

Days	$\Phi(z)$	Days	$\Phi(z)$	Days	$\Phi(z)$
7	0.321	23	0.128	39	0.372
8	0.291	24	0.129	40	0.411
9	0.264	25	0.132	41	0.452
10	0.24	26	0.136	42	0.497
11	0.22	27	0.141	43	0.544
12	0.202	28	0.148	44	0.592
13	0.186	29	0.157	45	0.641
14	0.173	30	0.167	46	0.69
15	0.162	31	0.179	47	0.738
16	0.152	32	0.194	48	0.784
17	0.145	33	0.211		
18	0.138	34	0.23		
19	0.134	35	0.252		
20	0.13	36	0.277		
21	0.128	37	0.306		
22	0.127	38	0.337		