



Stroke Play: The Effect of Strokes Gained & Traditional Golf Measurements on PGA Tour Golfers' Performance

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I. Abstract

This study estimates the qualitative and quantitative effect of strokes gained on PGA Tour golfers' performance. This performance is measured as the percentage of the total purse won at PGA Tour events for golfers making the cut. A cross-section model for 2,511 golfers across 33 tournaments in the 2018-2019 season is employed. The explanatory variables are the four strokes-gained measures: strokes gained off-the-tee (OTT), approach-to-the-green (APP), around-the-green (ARG), and putting (PUTT). The empirical results suggest that all four measures contribute to performance, with APP having the largest quantitative effect. Additionally, strokes gained explains more of golfers' performance than traditional golf measurements.

II. Empirical Model and Variables

$$\text{PERC}_i = f(\text{OTT}_i, \text{APP}_i, \text{ARG}_i, \text{PUTT}_i, \text{DRIV}_i, \text{GIR}_i)$$

- PERC_i is the percent of the total purse won at PGA Tour events for golfers' making the cut.
- OTT_i is Strokes Gained: Off-the-Tee which measures player performance off the tee on all par-4s and par-5s.
- APP_i is Strokes Gained: Approach-the-Green which measures player performance on approach shots. Approach shots include all shots that are not from the tee on par-4 and par-5 holes and are not included in strokes gained: around-the-green and strokes gained: putting.
- ARG_i is Strokes Gained: Around-the-Green which measures player performance on any shot within 30 yards of the edge of the green.
- PUTT_i is Strokes Gained: Putting which measures how many strokes a player gains or loses on the greens
- DRIV_i is the average number of yards per measured drive.
- GIR_i is the percent of time a player was able to hit the green in regulation.

III. Theory and Model

- OTT_i , APP_i , ARG_i , and $PUTT_i$ are all hypothesized to have positive relationship with $PERC_i$. A unit increase in a beta coefficient is equivalent to a stroke gained respective to the type of shot it is classified as. When using the measure strokes gained to determine performance, the highest number of strokes gained relative to the field means you are outperforming other competitors by shooting a lower score. Any positive number represents a percentage increase in the total purse won at a PGA Tour event.
- $DRIV_i$ is hypothesized to have a positive relationship with $PERC_i$ because when golfers hit their tee shot further, it makes performing well on the hole easier because they're next shots are closer to the pin.
- GIR_i is hypothesized to have a positive relationship with $PERC_i$ because the more greens a golfer can hit while playing gives them a better opportunity to make it in the whole while putting.

IV. Data

- Data was made accessible due to the generosity of Ken Lovell, Senior Vice President of ShotLink Business Operations at PGA Tour. All data are available from the PGA Tour's website.
- Data sources:
- *PGA Tour (<https://www.pgatour.com/>)*

V. Empirical Results

- *** Indicates Significance at the 1% Level
- ** Indicates Significance at the 5% Level
- * Indicates Significance at the 10% Level

- Estimated with Newey-West

Variable	Version 1	Version 2	Version 3
Constant	0.508147 (6.837797)***	-0.066020 (-3.882691)***	0.009554 (16.26455)***
OTT _i	1.154400 (12.44263)***		0.010395 (9.393299)***
APP _i	1.175071 (13.57556)***		0.010600 (10.37790)***
ARG _i	0.955386 (11.48901)***		
PUTT _i	0.321342 (13.31498)***		
DRIV _i		0.000113 (2.072719)**	
GIR _i		0.000686 (6.053036)***	
Adjusted R²	0.38117	0.057046	0.182644

VI. Conclusion

- The results indicate each strokes gained measure has a positive qualitative and quantitative impact on performance. The empirical results suggest that strokes gained: approach-to-the-green has the strongest qualitative impact on performance, showing that for each stroke gained on your approach shot, the percent of the total purse won at a PGA Tour event increases by 1.175%. The rank of the strokes gained measures that have the strongest qualitative impact on performance is as follows: APP, OTT, ARG, and PUTT.
- The results also indicate that the strokes gained method explain more of the variation in performance than traditional golf measurements do, such as driving distance and driving accuracy.
- Golfers of all levels can use this information to determine that if they want to perform at a higher level, time spent practicing their approach shots would be of the highest value.