Superstar Effects in Golf

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General Background Theory

- Peer Effects (Mas and Moretti, Guryan et al.)
- Superstar Effect (Brown, Connolly and Rendleman)
- Tournament Theory - Golf (Ehrenberg and Bognanno, Stein)
- Incentive Pay - Prize Distribution (Tanaka and Ishino, Ehrenberg and Bognanno, Stein)
  - Total Prize Money
  - Marginal Prize Money

Do Tournaments Have Incentive Effects? – Ehrenberg and Bognanno (1990)
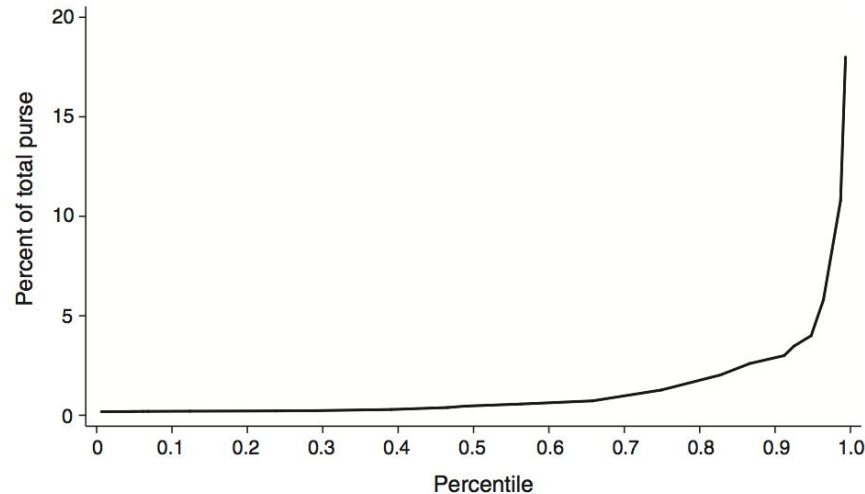
1)18% 2)10.8% 3)6.8% 4)4.8% 5)4% 6)
3.6% 7)3.35% 8)3.1% 9)2.9% 10)2.7% 11)
2.5%....70)0.2%

Reward is fixed and unaffected by absolute performance.

Evaluation is completely based on relative performance.

1. Increase Reward => Increased Performance
2. Increased Marginal Reward => Better Final Round Scores
3. Introduce a Superstar => ?

Quitters Never Win: The (Adverse) Incentive Effects of Competing with Superstars – Brown (2011)

Theory suggests that increases in the most skilled player lead to lower equilibrium effort from low-ability players in a tournament. (Stein 2002).

1. The presence of a superstar (Tiger Woods) in a tournament is associated with reduced performance from other competitors -- 1.358 strokes for rank 1-20, 0.804 strokes for 21-200, and 0.596 strokes for unranked players. In general the adverse effect is larger for higher-skilled golfers relative to lower-skilled players.
2. Reduced performance is not attributed to the adoption of risky strategies.
3. The adverse superstar effect is large in periods in which Tiger Woods is particularly hot and the effect disappears when he is cold.
4. Unexpected absences of Tiger Woods correspond with improved play by 3.5 strokes.

Tiger Woods Compared to the Rest of the Field
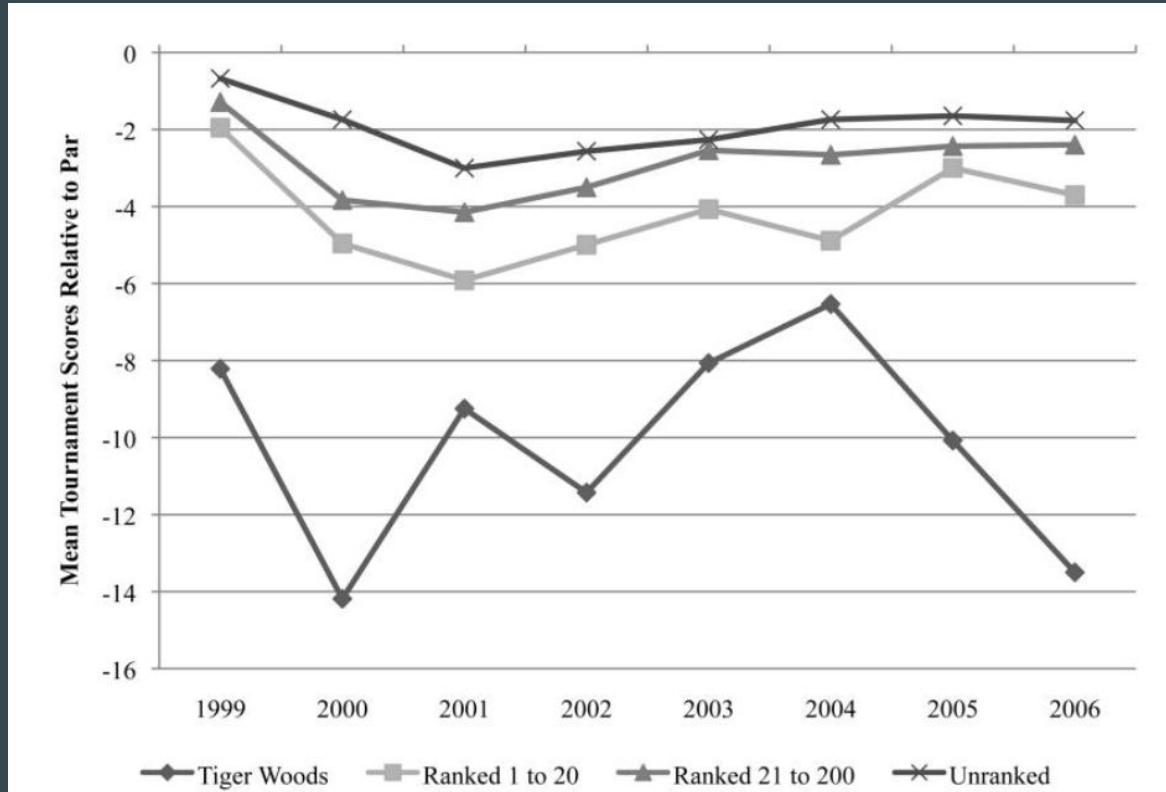
Avg. Difference in Score when Woods attends a Tournament versus not attending.

TABLE 2

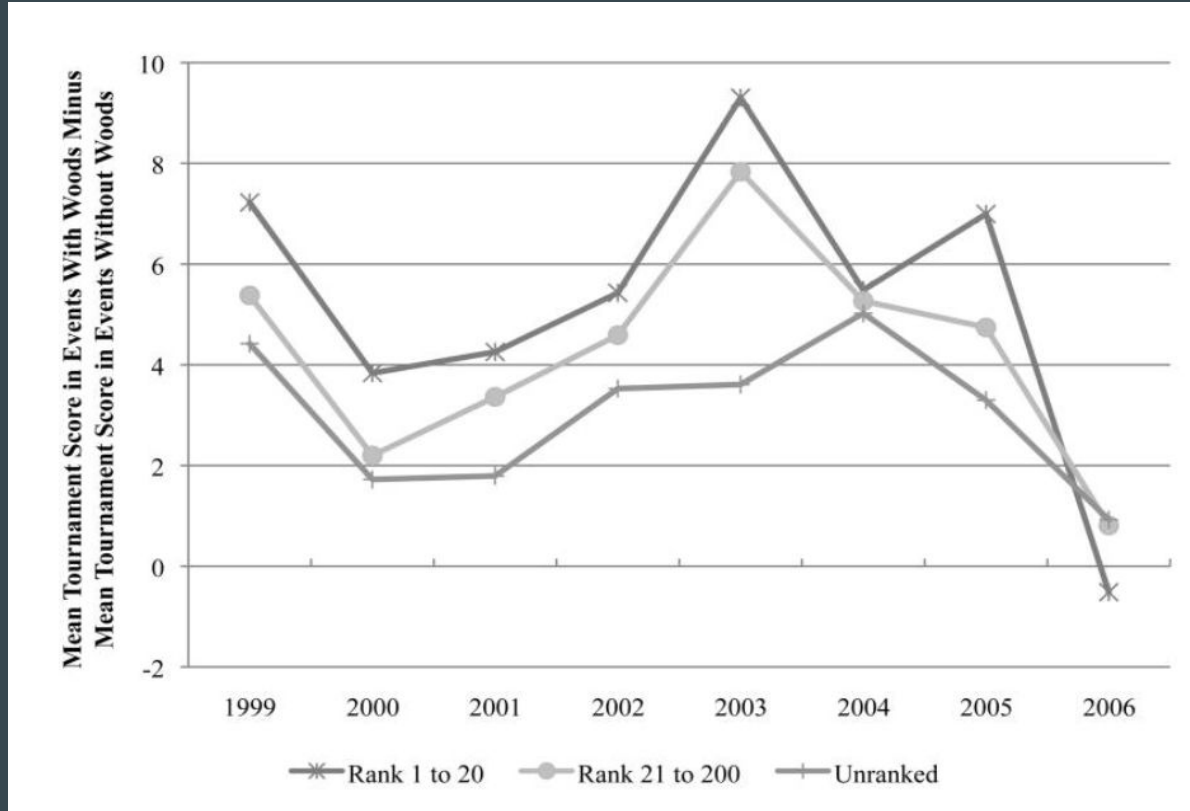### Regression Results for Scores in Regular and Major Tournaments, 1999–2006: Strokes Relative to Par

	Tournament Types			
	First Round Regulars and Majors (1)	First Round Regulars (2)	Tournament Regulars and Majors (3)	Tournament Regulars (4)
Superstar effect for players:				
Ranked 1–20	.596**	.535*	1.358**	.996
	(.281)	(.302)	(.726)	(.786)
Ranked 21–200	.161	.141	.804***	.672**
	(.113)	(.117)	(.318)	(.328)
Unranked	.202	.212	.596	.311
	(.126)	(.131)	(.396)	(.400)
Observations	34,986	29,167	18,805	15,651
Adjusted R^2	.29	.21	.48	.38

The (Adverse) Incentive Effects of Competing with Superstars: A Reexamination of the Evidence T- Connolly and Rendleman (2014)

1. Extensive data issues and player-course interactions observed only once lead to a data omission problem that falsely discovers a Tiger Woods effect on the field.
   a. Estimating fixed player and course effects separately, rather than as an interacted term like Brown does, results in no superstar effect on the field.
2. Players performed worse when Woods was absent -- the opposite of what Brown suggests.
3. No relationship between Wood's "hot" and "cool" periods with other player performance.

The (Adverse) Incentive Effects of Competing with Superstars: A Reexamination of the Evidence - Connolly and Rendleman (2014)

1. 15% of PGA Tour players taking the role of Woods are associated with abnormal performance among players ranked in the top 20. 50% of players taking Wood's role would be associated with abnormal performance among players ranked 21-200. 39% would be associated with abnormal performance among players worse than 200.

    a. Modest changes to Brown's model would result in only 5% having effects on other players performance, but Woods is not one of the superstars.

Panel C: Using Data Set 2 with Player and Course Interacted

Coefficient	First-Round			Event-Level		
	Est.	SE	p-Value	Est.	SE	p-Value
$star \times HRanked$	0.535	0.208	0.010	0.951	0.498	0.056
$star \times LRanked$	0.134	0.090	0.135	0.374	0.231	0.105
$star \times URanked$	0.249	0.103	0.016	0.177	0.293	0.546
N observations total	43,256			22,312		
N observations used	30,684			14,789		
N events total	306			302		
N events used	272			268		
Adj R^2	0.187			0.527		

Panel D: Using Data Set 2 with Player and Course Effects Estimated Separately

Coefficient	First-Round			Event-Level		
	Est.	SE	p-Value	Est.	SE	p-Value
$star \times HRanked$	0.243	0.137	0.076	0.361	0.307	0.240
$star \times LRanked$	0.123	0.069	0.074	0.344	0.167	0.040
$star \times URanked$	0.167	0.070	0.017	0.371	0.188	0.048
N observations	43,256			22,312		
N events	306			302		
Adj R^2	0.316			0.549		

Peer Effects in the Workplace: Evidence from Random Groupings in Professional Golf Tournaments – Guryan, Krott, and Notowidigo (2009)

1. No Peer Effects in Golf Tournaments
2. Modeling issues cause an unrecognizable bias downwards for peer effects in Golf. Reflection Problem.
3. Though playing within the Tiger Woods pairing improves scoring - SE is too high and cannot say anything.

$$Score_{iktr} = \alpha_1 + \beta_1\, Ability_i + \gamma_1\, \overline{Ability}_{-i,kt} + \delta_{tc} + e_{iktr}$$

$$Score_{iktr} = \alpha_2 + \beta_2\, Ability_i + \gamma_2\, \overline{Score}_{-i,ktr} + \delta_{tc} + \nu_{iktr}$$

Testing the Incentive Effects in Tournaments with a Superstar – Tanaka and Ishino (2012)

Replicate Brown's study in the Japanese Professional Golf Tour with Jumbo Ozaki as their superstar.

1. Participation of Ozaki in tournaments is associated with an adverse performance effect for his competitors -- 1.2 strokes over 4 rounds.
2. The larger the total prize is the better the performance is. A 10 million yen increase in total prize increases performance by 0.7 strokes on average.
3. Players facing a larger marginal prize perform better in the final round the better they perform in the 3rd round. Likewise, players who are tied after the third round perform better in the final round.

Research Plan

1. Data
   a. Shotlink PGA Tour Data
   b. Brown data via Professor Kato
2. Research Questions
   a. What is the peer effect/superstar effect of being paired with Tiger Woods?
   b. How important are marginal rewards for player performance considering sponsorship money that is slightly removed from relative performance.
   c. Who is right - Brown or Connolly/Rendleman?