



Does Pole Position Really Matter?

Mixed Model Relationship of MotoGP Qualifying Practice and Final Race Times



- Professional motorcycle grand prix racing.
- Rider with fastest lap in qualifying practice gets **POLE POSITION** for race.
- POLE POSITION** = front row, closest to inside of the track.
- Qualifying practice: day before race.
- Race Season = 18 race weekends, worldwide locations.

Is there a **POLE POSITION** curse?

- Through 10 races, no winner started from **POLE POSITION**.
- Curse broken in Race 11 in July at Laguna Seca Raceway by Casey Stoner.

Will tires be determining factors in the 2007 title hunt?

YES: 25,115 (84%)
 NO: 4,684 (16%)
 TOTAL: 29,799

Survey Results: MotoGP Website
www.motogp.com July 22, 2007

Questions

Relationship of qualifying practice time to race time Effects of rider characteristics on race results

Table 1a: Track Characteristics

Date/Track	Circuit	Date/Track	Circuit
3/18/2007	Losail Circuit	6/24/2007	Donington Park
3/25/2007	Jerez	6/30/2007	Estoril
4/13/2007	Estoril	7/15/2007	Sachsenring
5/6/2007	Shanghai Circuit	7/22/2007	Laguna Seca
5/20/2007	Le Mans	8/19/2007	Assen
6/3/2007	Magello	9/2/2007	Misano
6/18/2007	Circuit de Catalunya	9/16/2007	Estoril

Table 1b: Weather Conditions

Date/Track	Qualifying Practice Weather Conditions	Race Weather Conditions	Date/Track	Qualifying Practice Weather Conditions	Race Weather Conditions
3/18/2007	☀️	☀️	6/24/2007	☀️	☀️
3/25/2007	☀️	☀️	6/30/2007	☀️	☀️
4/13/2007	☀️	☀️	7/15/2007	☀️	☀️
4/22/2007	☀️	☀️	7/22/2007	☀️	☀️
5/6/2007	☀️	☀️	8/19/2007	☀️	☀️
5/20/2007	☀️	☀️	9/2/2007	☀️	☀️
6/3/2007	☀️	☀️	9/16/2007	☀️	☀️

Table 1c: Winners and Starting Position

Date/Track	Winner	Start Position	Date/Track	Winner	Start Position
3/18/2007	Casey Stoner #27	2	6/24/2007	Casey Stoner #27	5
3/25/2007	Valentino Rossi #46	2	6/30/2007	Valentino Rossi #46	11
4/13/2007	Casey Stoner #27	4	7/15/2007	Dani Pedrosa #26	2
4/22/2007	Casey Stoner #27	4	7/22/2007	Casey Stoner #27	1 (Pole)
5/6/2007	Chris Vermeulen #71	12	8/19/2007	Casey Stoner #27	1 (Pole)
5/20/2007	Valentino Rossi #46	3	9/2/2007	Casey Stoner #27	1 (Pole)
6/3/2007	Casey Stoner #27	4	9/16/2007	Valentino Rossi #46	3

8/14 (57.1%) had winners start on front row (top 3) and 3/14 (21.4%) races had winners starting on pole position.

Data

- First 14 of 18 races of MotoGP 2007 season
- 27 of 30 professional racers with complete race times (i.e. no crashes)
- Source: www.motogp.com and racer's websites
- Collected: qualifying practice and race lap times
- Rider Characteristics: age, body mass index (BMI), bike model, tire manufacturer
- Track Characteristics: date, weather, number of laps in race

Model Selection

- Independent Variable**: Fastest Lap Time
 - Ratio variables problematic due to non-constant variance hence not used
- Dependent Variable**: Final Average Race Lap Time
 - Easiest interpretation, adjusts for varying number of laps in each race
- Significant Predictors**: Age, Qualifying Race Time*Track
- Covariance Structure**: Compound Symmetry
 - No evidence of autoregressive correlation in times

Statistical Methods

- Repeated measures models in SAS 9.1 adjusting for track with random rider effect.
- Dependent Variable**: Race Time
 - Defined as 1) total time 2) average lap time 3) ratio of total time to winning time
- Independent Variable**: Qualifying Race Time
 - Defined as 1) fastest lap 2) ratio of fastest lap time to pole winner's fastest lap
- Covariates**:
 - age, BMI, bike model, tire manufacturer, starting race from front row (i.e. top 3 qualifying practice times) qualifying practice time*track



Race Winners

Casey Stoner #27 Age: 21 BMI: 20.0 8 Wins

Valentino Rossi #46 Age: 28 BMI: 17.8 4 Wins

Ducati Marlboro Team Bridgestone Tires

Fiat Yamaha Team Michelin Tires

Chris Vermeulen #71 Age: 25 BMI: 22.1 1 Win

Dani Pedrosa #26 Age: 22 BMI: 18.8 1 Win

Rizla Suzuki Team Bridgestone Tires

Honda Repsol Team Michelin Tires

Table 2. Rider Summary Statistics [N=27]

Variable	Mean	S.D	Range
Age	28	4.6	20-37
Body Mass Index BMI	21.1	1.54	17.8 - 23.7
	Number of Riders	Number of Pole Winners	Number of Race Winners
Tire Manufacturer	15	6	9
Bridgestone	7	2	1
Michelin	6	8	5
Dunlop	2	0	0
Bike Model			
Ducati Desmosedici GP7	6	5	8
Honda RC213V	7	2	1
Kawasaki ZX-RR	6	8	5
Roberts KR213V	2	0	0
Honda	2	0	1
Suzuki GSV-R	3	1	1
Yamaha YZR-M1	4	6	4

Conclusions

- Positive linear relationship between qualifying practice and final race times.
- Relationship not present when the weather conditions differ between practice and race time.
- Positive relationship between age and race time independent of the qualifying practice time (i.e. older riders slower, adjusting for track)
- Bike model, tire manufacturer, BMI, and front row starting position are not significantly associated with race time.