

Biomechanics and Player Availability in the NBA

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In the early 2010s, several NBA teams began implementing wearable technology to record biomechanical data with the hopes of optimizing player performance and minimizing injury risk. The rest of the league has followed a similar path over the past decade, posing ethical and financial implications - for example, in contract negotiations - as well as raising concerns about its effectiveness.

Is there a causal link between the use of biomechanics and player availability?

Difference-in-Differences Regression

To answer this question, I used the Difference-in-Differences causal framework, comparing treatment and control groups before and after treatment.

Time Frame: {2013, 2014}

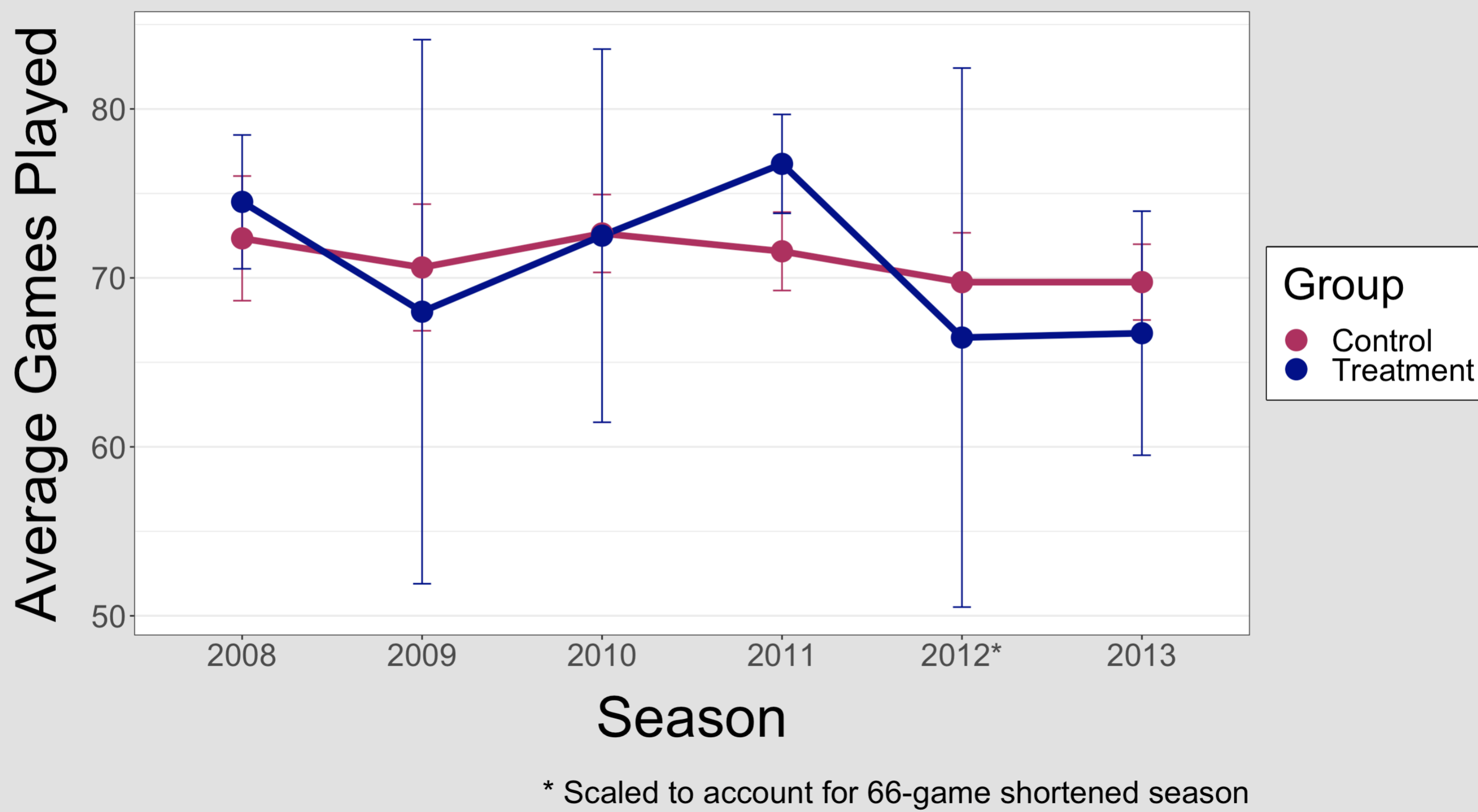
Treatment: use of wearable technology and/or biomechanics

Treatment Group: San Antonio Spurs, Dallas Mavericks, Houston Rockets, New York Knicks

Control Group: Rest of League (26 teams)

The treatment group consists of the first four teams to publicly use biomechanics prior to the 2013-14 season, according to public records.

Pre-Treatment: Parallel Trends Assumption

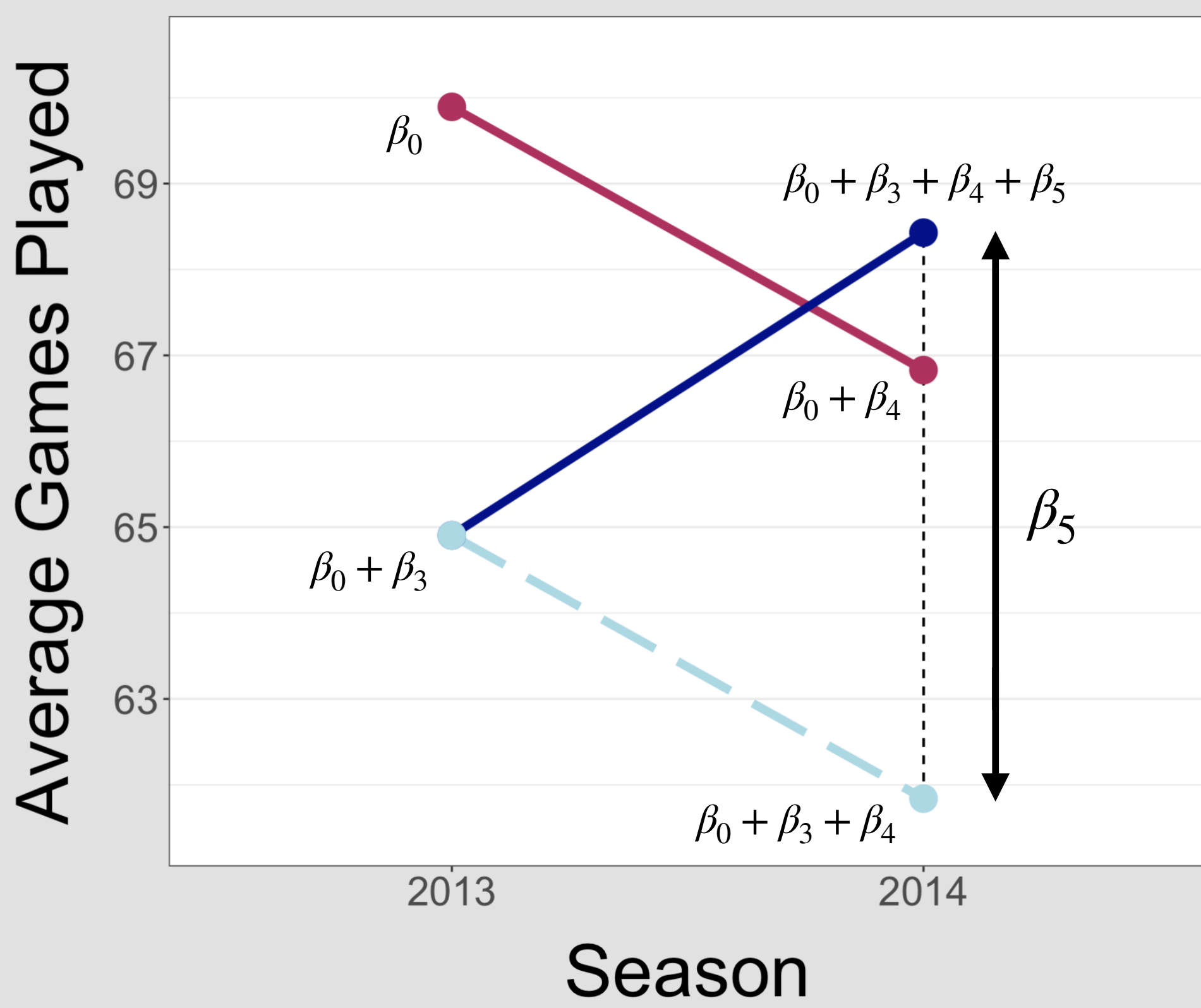


Other than Parallel Trends, some of the other main assumptions of the diff-in-diff causal model are exchangeability, consistency, positivity, ignorability, no interference, common shocks, and stable unit treatment value assumption (SUTVA).

Linear model to estimate the effect of biomechanics on games played, controlling for potential confounders:

$$GP = \beta_0 + \beta_1 \cdot lastGP + \beta_2 \cdot age + \beta_3 \cdot tech + \beta_4 \cdot time + \beta_5 \cdot tech \cdot time$$

Diff-in-Diff Intuition



Additional Notes

- 21 players in treatment group
- 169 players in control group
- Filtering only for players who averaged 15+ minutes, active players in both 2013 and 2014

$$H_0 : \beta_5 = 0 | H_1 : \beta_5 \neq 0$$

age : player's age during the given season

lastGP : games played in the previous season

tech : dummy variable indicating if the player's team belongs to the treatment group

time : dummy variable indicating if the given season was pre or post treatment (0 if 2013, 1 if 2014)

tech · time : dummy variable indicating if tech and time are both equal to one (β_5 : diff-in-diff estimator)

Promising but Inconclusive

- Diff-in-diff coefficient $\beta_5 = 7.89$ but not statistically significant
- Fail to reject H_0

Linear Model: Coefficients

Difference-in-Differences Estimation

Variable	Estimate	p-value
(Intercept)	67.20	<0.01
lastGP	0.26	<0.01
age	-0.55	<0.01
tech	-3.94	0.249
time	-2.97	0.066
tech:time	7.89	0.101

Main Limitations

- High variation due to limited sample size
- Load management (intentionally sitting out from a game)
- Lockout that shortened 2011-12 season from 82 to 66 games