The Van Exel Effect: Adjusting for Scorekeeper Bias in NBA Box Scores

Matthew van Bommel and Luke Bornn / Simon Fraser University / mvanbomm@sfu.ca



Van Exel's Career Night

In a January 1997 95-82 win against the host Vancouver Grizzlies, Los Angeles Lakers point guard Nick Van Exel was awarded a career high 23 assists. However, it was later revealed that the impressive statistic was the result of a disgruntled Grizzlies scorekeeper who decided to award Van Exel as many assists as possible in protest of the inaccuracy of box score statistics. This example, though extreme, highlights that NBA scorekeepers can have substantial influence in the recording of statistics.

In particular, scorekeepers affect the more subjective statistics of assists and blocks, thus we focus our attention on these metrics. Since assists and blocks are highly dependent on the number of made and attempted field goals



respectively, we examine the assist ratio (AR = assists per made field goal) and the block ratio (BR = blocks per opponent field goal attempt).



Passer and shooter court zone location effects on the recorded assist probability of an average potential assist. The arrows point in the direction of the pass and the points

Predicted Home Team Assist Ratio Predicted home team and away team assist ratio (left) and block ratio (right) for each scorekeeper.

Scorekeeper Behavior

To determine the impact of scorekeeper inconsistency on the recording of assists and blocks, we use 2015-2016 regular season box score data to build a game-level model. This model isolates the effects of the teams playing in each game from two scorekeeper effects: • scorekeeper generosity – how likely a scorekeeper is to award assists or blocks to both teams in a game

 scorekeeper bias – how much more likely a scorekeeper is to award an assist or block to the home team

The results of this model are

Spatio-Temporal Context Since assists develop over time, they are heavily influenced by their

are heavily influenced by their Using SportVu optical context. tracking data, we add spatiotemporal variables to create a new model to estimate the probability of individual assists being recorded. Here, we present results for court zone locations of the passer and shooter (left figure) and position and identity of the passer (below figure). Other variables include possession length, dribbles, and defender distance. We also compute adjusted player assist totals over the 2015-2016 NBA season which adjust for any potentially subjective influences

represent passes within each zone.

Player	Assist Change	Recorded Assists	Original Rank	Adjusted Rank	Position	Passer	Home SK	Away SK
Gordon Hayward	28.38	287	46	36	-0.26	-2.80	-24.90	-0.17
George Hill	18.64	257	55	48	3.98	-4.53	-20.60	0.25
Trevor Booker	18.29	83	222	187	-0.19	-3.75	-12.71	-0.01
Rodney Hood	16.83	208	71	67	0.41	0.25	-16.74	-1.39
Joe Ingles	16.74	93	203	171	0.29	-4.35	-11.28	0.58
Lavoy Allen	12.93	76	234	214	-1.60	-3.88	-6.03	0.71
Tyson Chandler	12.88	64	262	233	-2.09	-4.11	-7.06	-0.63
Derrick Favors	11.73	93	204	178	-0.20	0.32	-11.18	-0.92
Trey Lyles	10.16	60	273	242	-0.11	-1.33	-8.22	0.35
P.J. Tucker	9.83	176	96	81	-0.19	-2.34	-9.03	-1.62
Ish Smith	-19.60	495	11	12	4.99	1.13	11.78	-0.66
James Harden	-22.63	602	6	6	0.82	16.37	6.36	-2.65
Reggie Jackson	-24.34	483	14	15	5.79	6.76	10.66	-0.22
Jrue Holiday	-27.22	386	20	22	4.56	2.28	14.11	-1.74
LeBron James	-29.95	505	10	13	-0.32	13.32	14.72	-0.90
Tony Parker	-30.07	377	21	27	3.83	7.97	9.67	-0.05
Draymond Green	-30.09	587	7	7	-0.47	12.41	6.26	-1.02
G. Antetokounmpo	-30.56	342	29	39	-0.38	14.23	4.96	1.69
Ricky Rubio	-31.12	645	5	5	8.06	21.67	-7.03	-0.14
Chris Paul	-34.80	729	4	4	5.73	16.34	11.06	-0.90

Assist adjustments for players experiencing the greatest increases or decreases. The last four columns display estimated numbers of extra assists originally awarded due to the given effect (SK is scorekeeper).

displayed in the above figure. (left table).



Passer effects and (passer) position effects on the recorded assist probability of an average potential assist. The player effects displayed represent the highest and lowest effects at each position.

10 Adjusted Assists ß 0 - - - - - - - -**Recoded Assists** S 10 Atlanta LA Clippers New Orleans Utah Houston Scorekeeper

Scorekeeper bonus distributions of the home team (left curves) and away teams (right curves) for 5 selected scorekeepers Each observation represents a single game.

Impact on Daily Fantasy

Since scoring systems of daily fantasy contests often rely exclusively on box score statistics, scorekeeper inconsistencies have the potential to affect their outcomes. Of particular interest to participants is the variability of scorekeeper behavior. Using our adjusted assist totals, we compute the "scorekeeper bonus" (recorded assists – adjusted assists) values for each game for all 30 NBA scorekeepers, and find large differences among the resulting distributions (left figure). These differences can lead to monetary consequences for daily fantasy participants and potentially legal consequences for the NBA.

For the full paper visit: matthewvanbommel.com or lukebornn.com