

Inside the NBA Bubble: How Black Players Performed Better without Fans

ONLINE APPENDIX

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A Additional Tables

Table A1: Effect of Bubble (no fans) on players' performance, robustness checks

Dep. var.	GS Clustering (1)	GS Large sample (2)	PER Alt. dep. var. (3)	VORP (4)
Bubble $\times$ Black	2.503*** (0.783)	2.230*** (0.778)	3.695*** (1.166)	0.356*** (0.136)
Individual controls	Yes	Yes	Yes	Yes
Player FE	Yes	Yes	Yes	Yes
Team-Game FE	Yes	Yes	Yes	Yes
Observations	1,870	3,242	1,870	1,870
R-squared	0.559	0.583	0.515	0.425

Notes: The dependent variable is players' Game Score (GS) in columns (1) and (2), the player efficiency rating (PER) per game in column (3), and Value over Replacement Player (VORP) rating in column (4). Bubble is a dummy equal to 1 for all games played inside the NBA Bubble without fans. Black is a dummy equal to 1 for Black players. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Standard errors are two-way clustered at the player-season and team-game levels in column (1). Standard errors are clustered at the team-game level in columns (2), (3) and (4). * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A2: Effect of Bubble (no fans) on players' performance, placebo

	Larger sample (1)	Only teams in playoffs (2)
Season 2020 $\times$ Black	0.179 (0.167)	0.201 (0.227)
Individual controls	Yes	Yes
Player FE	Yes	Yes
Team-Game FE	Yes	Yes
Observations	39,699	23,067
R-squared	0.457	0.494

Notes: The dependent variable is players' Game Score. Season 2020 is a dummy equal to 1 for all games played before the Bubble in the regular season of 2019-2020 and equal to 0 for all games played in the regular season of 2018-2019. Black is a dummy equal to 1 for Black players. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Column (1) includes all observations part of the regular seasons and outside the Bubble. Column (2) restricts the sample to teams that played in the 2019 or 2020 playoffs. Standard errors are clustered at the team-game level. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A3: Effect of Bubble (no fans) on players' performance, 2019-2021 playoffs

	Baseline (1)	Large sample (2)
Bubble $\times$ Black	2.561*** (0.762)	2.065*** (0.709)
2021 $\times$ Black	1.068 (0.974)	0.955 (0.817)
Individual controls	Yes	Yes
Player FE	Yes	Yes
Team-Game FE	Yes	Yes
Observations	2,481	4,894
R-squared	0.573	0.578

Notes: The dependent variable is players' Game Score. Bubble is a dummy equal to 1 for all games played inside the NBA Bubble without fans (2020 playoffs). 2021 is a dummy equal to 1 for all games played in the 2021 playoffs (with fans). Black is a dummy equal to 1 for Black players. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Column (1) uses a sample that corresponds to our main sample plus observations for 2021 for all players included in the main sample. Column (2) uses a large sample that includes all players who play at least one game in any playoffs. Standard errors are clustered at the team-game level. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A4: Effect of Bubble (no fans) on players' performance, by opponents' region

	Northeast & South (1)	Midwest & West (2)
Bubble $\times$ Black	5.499*** (1.213)	0.096 (1.567)
Individual controls	Yes	Yes
Player FE	Yes	Yes
Team-Game FE	Yes	Yes
Observations	789	1,081
R-squared	0.617	0.575

Notes: The dependent variable is players' Game Score. Column (1) uses a sample of games in which the opponent teams are from the Northeast and the South. Column (2) uses a sample of games in which the opponent teams are from the Midwest (including the Toronto Raptors) and the West. Bubble is a dummy equal to 1 for all games played inside the NBA Bubble without fans. Black is a dummy equal to 1 for Black players. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Standard errors are clustered at the team-game level. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A5: Effect of Bubble (no fans) on players' performance, by composition of opponent fans and away games

	Racist searches (1)	Non-Black fans (2)	Slave state (3)
Bubble $\times$ Black	0.574 (1.293)	0.342 (1.335)	0.718 (1.150)
Black $\times$ Racist searches	-1.221 (1.572)		
Bubble $\times$ Black $\times$ Racist searches	4.695* (2.439)		
Black $\times$ Non-Black fans		-3.164* (1.525)	
Bubble $\times$ Black $\times$ Non-Black fans		5.166** (2.485)	
Black $\times$ Slave state			-3.155 (3.336)
Bubble $\times$ Black $\times$ Slave state			7.780** (3.878)
Individual controls	Yes	Yes	Yes
Player FE	Yes	Yes	Yes
Team-Game FE	Yes	Yes	Yes
Observations	933	933	933
R-squared	0.559	0.559	0.560

Notes: The dependent variable is players' Game Score. The sample is restricted to away games (both actual and 'nominal' within the bubble). Bubble is a dummy equal to 1 for all games played inside the NBA Bubble without fans. Black is a dummy equal to 1 for Black players. Column (1) includes interactions with Racist searches, a dummy equal to one if the opponent team is from a state with a high prevalence of racist attitudes (top 25%) according to Google searchers as in [Stephens-Davidowitz \(2014\)](#). Column (2) includes interactions with Non-Black fans, a dummy equal to one if the opponent team has a high share of non-Black fans (top 25%). Column (3) includes interactions with Slave state, a dummy equal to one if the opponent team is from a slave state according to the 1820 Missouri Compromise. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Standard errors are clustered at the team-game level.

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

Table A6: Effect of Bubble (no fans) on players' performance, by pre-Bubble performance

	Below median performance (1)	Above median performance (2)
Bubble $\times$ Black	0.184 (1.052)	5.030*** (1.435)
Individual controls	Yes	Yes
Player FE	Yes	Yes
Team-Game FE	Yes	Yes
Observations	1,080	790
R-squared	0.523	0.599

Notes: The dependent variable is players' Game Score. Column (1) uses a sample of players with an average pre-Bubble performance below the median based on the 2019 value for wins above replacement ([Silver, 2019](#)). Column (2) uses a sample of players with an average pre-Bubble performance above the median based on the 2019 value for wins above replacement. Bubble is a dummy equal to 1 for all games played inside the NBA Bubble without fans. Black is a dummy equal to 1 for Black players. Individual controls include a dummy equal to 1 if a player is in the starting lineup in a game. Standard errors are clustered at the team-game level. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

References

- Silver, N. (2019). How Our RAPTOR Metric Works, FiveThirtyEight. <https://fivethirtyeight.com/features/how-our-raptor-metric-works/>. [Online; accessed 13 September 2022].
- Stephens-Davidowitz, S. (2014). The cost of racial animus on a black candidate: Evidence using Google search data. *Journal of Public Economics* 118, 26–40.