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|  | Covid-19 Natural Experiment | Country aggregate | Crowd Occupancy | Referee Bias | Crowd size | Team Age | Share of Foreigners | Study Conclusions |
| Boyko, Boyko, & Boyko (2007) | 🗶 | 🗶 | ✓ | ✓ | ✓ | 🗶 | 🗶 | Indivdual referees give significant different responses to crowd noise and have significant different levels of home team bias. |
| Carron & Agnew (1994) | 🗶 | 🗶 | ✓ | ✓ | ✓ | 🗶 | 🗶 | There is a positive relationship with crowd density and home advantage. But the explanatory power of crowd support effects is rather low |
| Courneya & Carron (1992) | 🗶 | ✓ | 🗶 | 🗶 | ✓ | 🗶 | 🗶 | Crowd size is a significant predictor of home advantage |
| Endrich& Gesche (2020) | ✓ | 🗶 | ✓ | ✓ | 🗶 | 🗶 | 🗶 | There is a significant change in punishment for away teams in the situation of “ghost games”. |
| Fischer & Haucap (2020) | ✓ | 🗶 | ✓ | ✓ | ✓ | 🗶 | 🗶 | Crowd occupancy is the main driver of differences in home advantage pre and post covid-19. Referee bias and absolute crowd size appear less important. |
| Mccarick et al(2020) | ✓ | ✓ | ✓ | ✓ | 🗶 | 🗶 | 🗶 | Home advantage decreased significantly after covid-19, points and goals for home teams decreased. Also referee issued significantly fewer sanctions against away teams. |
| Nevill & Holder  (1999) | 🗶 | 🗶 | 🗶 | ✓ | ✓ | 🗶 | 🗶 | Referee bias is the most important component of crowd support effect on team performance |
| Pollard (2006) | 🗶 | ✓ | 🗶 | ✓ | ✓ | 🗶 | 🗶 | Home advantage is a result of many different factors all interacting with each-other. With differeng levels across countries and sports. |
| Pollard (2008) | 🗶 | ✓ | 🗶 | ✓ | ✓ | 🗶 | 🗶 | Home advantage is a result of many different factors all interacting with each-other. |
| Ponzo & Scoppa (2018) | 🗶 | 🗶 | 🗶 | ✓ | 🗶 | 🗶 | 🗶 | Home advantage still persists in derby matches, where familiarity and travel factors are mitigated. Supporting the notion of crowd support influencing home advantage. |
| Schwartz & Barsky (1977) | 🗶 | ✓ | ✓ | 🗶 | ✓ | 🗶 | 🗶 | Home advantage primarily sterns from crowd support. With stronger crowd support(occupancy/size) increasing home advantage |
| Van der Ven (2016) | 🗶 | 🗶 | 🗶 | 🗶 | 🗶 | ✓ | 🗶 | Teams with a higher average age perform better in Away games |
| Tilp & Thaller (2020) | ✓ | 🗶 | 🗶 | ✓ | 🗶 | 🗶 | 🗶 | Covid has turned home advantage into a home disadvantage in case of “ghost games” |
| THIS PAPER | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |  |

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|  | **Mean (M)** | **St. Dev. (SD)** | **Min** | **Pct(25)** | **Median** | **Pct(75)** | **Max** | **N** |
| ***Dependent Variables*** |  |  |  |  |  |  |  |  |
| Percentage points Home | 0.561 | 0.429 | 0 | 0 | 0.5 | 1 | 1 | 8,137 |
| Expected Goals Difference | 0.256 | 1.299 | -8.04 | -0.56 | 0.24 | 1.06 | 6.79 | 5,999 |
| Goal Difference | 0.292 | 1.846 | -13 | -1 | - | 1 | 10 | 8,137 |
| ***Moderators*** |  |  |  |  |  |  |  |  |
| Foreigners Share difference | -.00001 | 0.213 | -0.752 | -0.139 | -0.001 | 0.139 | 0.752 | 8,137 |
| Age Difference | 0.0001 | 1.573 | -5.00 | -1.100 | 0 | 1.100 | 5.00 | 8,137 |
| Occupancy Rate | 0.525 | 0.359 | 0 | 0.162 | 0.605 | 0.831 | 1 | 8,137 |
| Crowdsize | 17,797.990 | 18,466.020 | 0 | 2,913 | 12,321 | 27,022 | 81,171 | 8,137 |
| ***Mediators*** |  |  |  |  |  |  |  |  |
| Yellow Card Difference | -0.185 | 1.747 | 7 | -1 | 0 | 1 | 7 | 8,137 |
| Foul Difference | -0.107 | 5.243 | -24 | -4 | 0 | 3 | 18 | 8,135 |
| Red Card Difference | -0.026 | 0.456 | -3 | 0 | 0 | 0 | 3 | 8,136 |
| ***Control Variables*** |  |  |  |  |  |  |  |  |
| Rating Difference | 0.101 | 15.625 | -58.310 | -9.640 | 0.240 | 9.800 | 62.270 | 8,137 |
| Importance Difference | 1.095 | 32.106 | -100 | -16.775 | 0.100 | 19.475 | 100 | 8,054 |

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| **Variable** | **Operationalization** |
| **Dependent variables** |  |
| Percentage points home | The percentage of total points obtained by the home team in a single match, 0 = 0% , 1 = 100% |
| Expected goals difference | Continuous number obtained by deducting expected goals for the away team from the expected goals of the home team |
| Goal difference | Integer value obtained by deducting number of away goals from number of home goals |
| **Moderators** |  |
| Foreigner share difference | Share of foreigners home team - Share of foreigners away team |
| Age difference | Average age Home Team - Average age Away Team |
| Occupancy rate | Continuous value between 0(no spectators) and 1(sold out stadium) |
| Crowdsize | Small if average attendance smaller than 20,000, Medium if average attendance between 20,000 and 40,000 , Large if average attendance > 40,000 |
| **Mediators** |  |
| Yellow card difference | Integer value obtained by deducting the number of away red cards from the number of home red cards |
| Foul difference | Integer value obtained by deducting the number of away red cards from the number of home red cards |
| Red Card difference | Integer value obtained by deducting the number of away red cards from the number of home red cards |
| **Independent variables** |  |
| Covid | 1 = match played post-covid 0 = match played pre covid |
| **Control variables** |  |
| Rating difference | Number between -100 and 100 obtained by deducting away team strength rating from home team strength rating |
| Importance difference | Number between -100 and 100 obtained by deducting away team match importance from home team match performance |
| VAR | 1 if VAR technology was available 0 if not |

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|  | **Pre-Covid** | **During Covid** |
|  |  |  |
| Home wins |  |  |
| Home Points |  |  |
| Home Goals |  |  |
| Home Expected Goals |  |  |
| Home Yellow cards |  |  |
| Home Fouls |  |  |
| Home Red Cards |  |  |
| Away Wins |  |  |
| Away Points |  |  |
| Away Goals |  |  |
| Away Expected Goals |  |  |
| Away Yellow Cards |  |  |
| Away Fouls |  |  |
| Away Red Cards |  |  |