

Is Old Trafford Still a Fortress?

Manchester United’s Home Advantage and the Bruno Fernandes Era

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Abstract

This paper studies whether Old Trafford remains a distinctive source of competitive advantage for Manchester United in the Premier League era. Using match-level Premier League data from 1993/94 through 22 March 2026, I construct a symmetric team-match panel of 25,266 observations from 12,633 fixtures and estimate home-advantage models for points, goal difference, and win probability. The preferred specification uses team-season fixed effects, so identification comes from within-club, within-season differences between home and away matches rather than cross-club differences in quality. The model compares Manchester United’s home premium with the league-wide home premium and allows that difference to vary across four eras. Premier League home advantage remains large and statistically significant. Manchester United’s full-sample additional home-points premium is not statistically significant, partly because Ferguson-era United were also elite away from home. In the modern Bruno era, measured through the March 2026 cutoff, United’s additional home premium is positive relative to the Premier League benchmark. I then add an exploratory player layer using six completed-season observations from 2019/20 through 2024/25. Bruno Fernandes’ key-pass intensity is positively but imprecisely associated with Manchester United’s shot volume and is not reliably associated with goals or points. The evidence therefore supports a nuanced conclusion: Old Trafford’s advantage has not simply disappeared, but its form has shifted from broad institutional dominance toward a modern combination of renewed home performance and player-centered creative dependence.

Keywords: home advantage, Premier League, Manchester United, Old Trafford, Bruno Fernandes, football analytics, econometrics.

JEL-style classification: Z20, Z21, C23, L83.

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1 Introduction

For much of the Premier League era, Old Trafford has been described as a fortress. The phrase captures more than nostalgia. It suggests that Manchester United’s stadium historically operated as a measurable competitive advantage: a place where visiting teams expected pressure, where refereeing and crowd dynamics could tilt marginal moments, and where the club’s institutional dominance was reinforced by geography, atmosphere, and history. Yet the same phrase also invites a testable question: is Old Trafford still a fortress?

The question matters because home advantage is one of the most persistent empirical patterns in sport. Across leagues and periods, home teams tend to win more often, score more goals, receive more favorable marginal decisions, and perform more aggressively. The usual explanations include crowd support, referee pressure, reduced travel costs, venue familiarity, tactical behavior, and psychological comfort. The COVID-19 period, when matches were played with absent or restricted crowds, created a natural experiment that strengthened the case that spectators matter for home advantage and referee behavior. Studies of empty-stadium football generally find that home advantage and some forms of referee bias were reduced when crowds disappeared.

Manchester United are a particularly interesting case because the club’s home narrative is inseparable from its broader institutional trajectory. The Ferguson era was defined by sustained dominance, but the post-Ferguson period has been more volatile. The club has rotated through managers, recruitment strategies, playing styles, and ownership debates while rival clubs, especially Manchester City, have become structurally stronger. A simple comparison of home and away performance is therefore insufficient. If United used to win everywhere, a smaller home-away gap during the Ferguson era may not mean Old Trafford was weak; it may mean the team was so strong away from home that the measured differential was compressed. Conversely, a larger modern home premium may reflect renewed home strength, away fragility, or both.

This paper examines Manchester United’s home advantage in the Premier League era using match-level data. I define home advantage as the incremental performance associated with playing at home relative to away, and I distinguish between two concepts: the league-wide home premium and Manchester United’s additional home premium relative to that benchmark. The empirical analysis uses points, goal difference, and win probability as outcomes. The central coefficient is the interaction between a home indicator and a Manchester United indicator, with season fixed effects. I then allow that interaction to vary by era.

The paper also introduces an inner layer centered on Bruno Fernandes. This layer is not meant to replace the main home-advantage model. Instead, it asks whether modern

Manchester United’s performance identity is partly explained by a shift from place-based dominance toward player-centered creative dependence. Bruno is a natural focal point. Since joining Manchester United in January 2020, he has been one of the Premier League’s highest-volume creators. Season-level key-pass data suggest that his creative output is a consistent and unusually visible component of United’s attack. The Bruno layer therefore complements the Old Trafford analysis: if Old Trafford was the historical institutional focal point, Bruno Fernandes may represent the modern creative focal point.

The findings are fourfold. First, Premier League home advantage is positive and statistically significant across the full period: home teams earn about 0.505 additional points, 0.726 additional goals in goal difference, and 16.7 percentage points more win probability relative to away teams after controlling for team-season fixed effects. Second, Manchester United’s additional average home-points premium over the whole sample is not statistically significant; this is consistent with the idea that United’s historical dominance also extended to away matches. Third, era-specific estimates reveal deterioration after Ferguson and during the COVID transition, followed by a positive modern-era additional home premium through the March 2026 cutoff. Fourth, Bruno’s key-pass intensity is positively but imprecisely associated with United shot volume in the six-season exploratory sample, and not with goals or points. Creativity may improve attacking conditions without guaranteeing conversion or results.

The remainder of the paper is organized as follows. Section 2 reviews literature on home advantage, COVID-era football, and Manchester United’s post-Ferguson trajectory. Section 3 describes the data and constructs the team-match panel. Section 4 presents descriptive evidence. Section 5 sets out the econometric specification. Section 6 reports the main results. Section 7 presents the Bruno Fernandes inner layer. Section 8 concludes.

2 Literature Review

2.1 Home advantage in football

Home advantage has long been documented across sports and is particularly visible in football. The home team usually benefits from familiar surroundings, reduced travel, crowd support, and psychological comfort. However, football is also a low-scoring sport, which means that small behavioral or officiating changes can translate into meaningful differences in points. A narrow decision, a yellow card, a corner, or one additional shot on target can change match outcomes.

Recent literature has made the home-advantage mechanism more concrete. Bilalic, Gula, and Vaci (2021) study home advantage mediated by referee bias and team performance

during COVID-related restrictions, emphasizing that home advantage can operate through both player performance and officiating channels. Leitner and colleagues (2022) synthesize COVID-era studies and conclude that empty stadiums reduced home advantage and decreased referee bias in several contexts. The COVID shock is important because it separates the stadium as a physical location from the stadium as a crowd environment. If the home premium falls when fans disappear, the crowd channel is likely material.

Other studies emphasize heterogeneity across leagues. Lyhagen (2025) finds evidence of a crowd-support effect in the English Championship but a weaker effect in the Premier League once relative team strength is controlled for. Konaka (2021), using European leagues, also finds that closed-door matches reduced home advantage, although the effect varied by league. Together, this literature suggests that home advantage should be modeled as time-varying rather than fixed. It may shrink or expand as tactics, travel, officiating technology, and stadium culture change.

2.2 The Premier League and competitive structure

The Premier League is not a static competitive environment. A home premium estimated over the entire Premier League era averages across major structural changes: the rise of global broadcasting revenue, tactical modernization, sports science, VAR, improved travel logistics, and changing competitive balance. Basini, Tsouli, Ntzoufras, and Friel (2021) use a stochastic block model to study competitive balance in English football over more than 40 seasons, providing evidence of structural change around the early 2000s. This matters for Manchester United because the club’s own trajectory is embedded in a league that became richer, more tactically complex, and more competitive.

Data availability has also improved. Football-Data.co.uk provides computer-readable historical results, match statistics, and betting odds, while the DataHub English Premier League package organizes match-by-match Premier League data from 1993/94 to the current season. These sources make it possible to model home advantage using large match-level panels rather than isolated club histories.

2.3 Manchester United after Ferguson

The Manchester United-specific literature is thinner than the general home-advantage literature, and much of it is closer to sports-management analysis than econometric research. Still, several works are relevant. English (2025) studies the Glazer ownership period and argues that leveraged ownership, financial structure, and managerial choices are central to the club’s long-run performance trajectory. Jackson (2025) provides a data-driven comparison of

Manchester United and Manchester City in the post-Ferguson era, emphasizing contrasting performance metrics, tactical evolution, and strategic decision-making. Horrocks (2016) studies football development using Manchester United as a case, highlighting talent development and institutional processes.

These works share a broad theme: Manchester United’s recent performance should not be read only through individual managers or single seasons. It reflects institutional structure, recruitment, tactical coherence, and rival improvement. This paper adds a match-level performance lens to that discussion by focusing specifically on the home advantage associated with Old Trafford.

2.4 Bruno Fernandes and player-centered creative dependence

Modern football analytics increasingly distinguishes between final outputs, such as goals and assists, and process variables, such as expected assists, key passes, progressive passes, and shot-creating actions. Bruno Fernandes is a useful case because his value is often visible in process metrics even when final outcomes depend on teammates’ finishing. Public databases such as StatMuse report season-level Premier League key passes for Bruno Fernandes from 2019/20 onward, and the official Premier League has emphasized his high chance-creation volume in recent seasons.

For this paper, the Bruno layer is deliberately positioned as an exploratory extension. It does not claim that Bruno causes United’s home advantage. Instead, it asks whether the modern era of United performance is consistent with a broader shift: less of a total-club dominance effect, more of a concentrated creative structure. This is the bridge between the Old Trafford question and the player-specific question.

3 Data

3.1 Match-level Premier League data

The main dataset is a match-level panel of Premier League fixtures from 1993/94 through 22 March 2026. The 2025/26 season is therefore intentionally treated as an in-progress season rather than a completed one. The raw files are season-level CSVs from the DataHub English Premier League package, which is sourced from Football-Data.co.uk. The dataset includes match date, home and away teams, full-time goals, full-time result, half-time result, referee, shots, shots on target, fouls, corners, yellow cards, and red cards for seasons where those variables are available.

Each match is converted into two team-match observations: one for the home team and one for the away team. This creates a panel of 25,266 team-match observations from 12,633 Premier League matches. The key variables are defined as:

$$Points_{i,m} = \begin{cases} 3, & \text{if team } i \text{ wins match } m, \\ 1, & \text{if team } i \text{ draws match } m, \\ 0, & \text{if team } i \text{ loses match } m, \end{cases} \quad (1)$$

$$GD_{i,m} = GoalsFor_{i,m} - GoalsAgainst_{i,m}, \quad (2)$$

$$Win_{i,m} = \mathbb{I}(GoalsFor_{i,m} > GoalsAgainst_{i,m}), \quad (3)$$

$$Home_{i,m} = \mathbb{I}(\text{team } i \text{ plays at home}), \quad (4)$$

$$MU_i = \mathbb{I}(\text{team } i \text{ is Manchester United}). \quad (5)$$

The analysis focuses on points, goal difference, and win probability because these outcomes capture different dimensions of performance. Points are the direct league currency. Goal difference captures performance margin. Win probability captures the binary outcome most commonly used in home-advantage discussions.

3.2 Era definitions

The sample is divided into four eras:

1. **Ferguson era:** 1993/94 through 2012/13.
2. **Post-Ferguson pre-Bruno:** 2013/14 through 2018/19.
3. **Bruno/COVID transition:** 2019/20 through 2020/21.
4. **Bruno modern era:** 2021/22 through 22 March 2026.

This classification is not perfect because Bruno joined during the 2019/20 season and COVID restrictions affected both 2019/20 and 2020/21. For that reason, the transition period is kept separate from the modern Bruno era. This avoids treating the no-fans shock and Bruno's arrival as a single clean treatment. The modern-era estimates include completed fixtures only through 22 March 2026, so they should be read as a point-in-time estimate rather than a final assessment of the 2025/26 season.

3.3 Bruno Fernandes data

The Bruno layer uses completed-season key-pass data from StatMuse for Premier League seasons 2019/20 through 2024/25. The 2019/20 observation is partial because Bruno joined Manchester United in January 2020. I exclude the incomplete 2025/26 player season from this extension so that later full-season information is not imported into a March 2026 paper. I define Bruno’s key-pass intensity as:

$$KP90_s = \frac{KeyPasses_{Bruno,s}}{Minutes_{Bruno,s}/90}. \quad (6)$$

I then merge this with Manchester United season-level attacking outcomes constructed from the match-level panel:

$$ShotsPG_s = \frac{\sum_{m \in s} ShotsFor_{MU,m}}{Matches_{MU,s}}, \quad (7)$$

$$GoalsPG_s = \frac{\sum_{m \in s} GoalsFor_{MU,m}}{Matches_{MU,s}}, \quad (8)$$

$$PPG_s = \frac{\sum_{m \in s} Points_{MU,m}}{Matches_{MU,s}}. \quad (9)$$

Because this layer contains only six season-level observations, all Bruno regressions are interpreted as exploratory correlations rather than robust causal estimates.

4 Descriptive Analysis

4.1 Old Trafford across eras

A first look at the data shows why the Old Trafford question is subtle. During the Ferguson era, Manchester United were outstanding both at home and away. United averaged 2.43 points per match at home and 1.91 away, producing a home premium of 0.52 points. In the same period, the Premier League average home premium was 0.58 points. On a narrow home-minus-away definition, United’s home premium was therefore not larger than the league average. But this does not mean Old Trafford was weak; rather, United were so strong away from home that the home-away gap was compressed.

The post-Ferguson pre-Bruno period shows a reduction in United’s home advantage. United’s home premium fell to 0.42 points per match, below the Ferguson-period level. The Bruno/COVID transition is the most distorted era, with United’s home points premium turning slightly negative. This period includes COVID-related disruption and should not

be interpreted as a stable structural regime. In the Bruno modern era through 22 March 2026, the home premium rises to approximately 0.63 points, above the league premium of approximately 0.36 points.

Table 1: Descriptive home advantage by era

Era	MU home PPG	MU away PPG	MU premium	PL premium	MU GD premium
Ferguson era	2.432	1.911	0.521	0.582	0.891
Post-Ferguson pre-Bruno	2.035	1.614	0.421	0.461	0.614
Bruno/COVID transition	1.789	1.895	-0.105	0.186	0.184
Bruno modern era	1.901	1.272	0.629	0.356	0.843

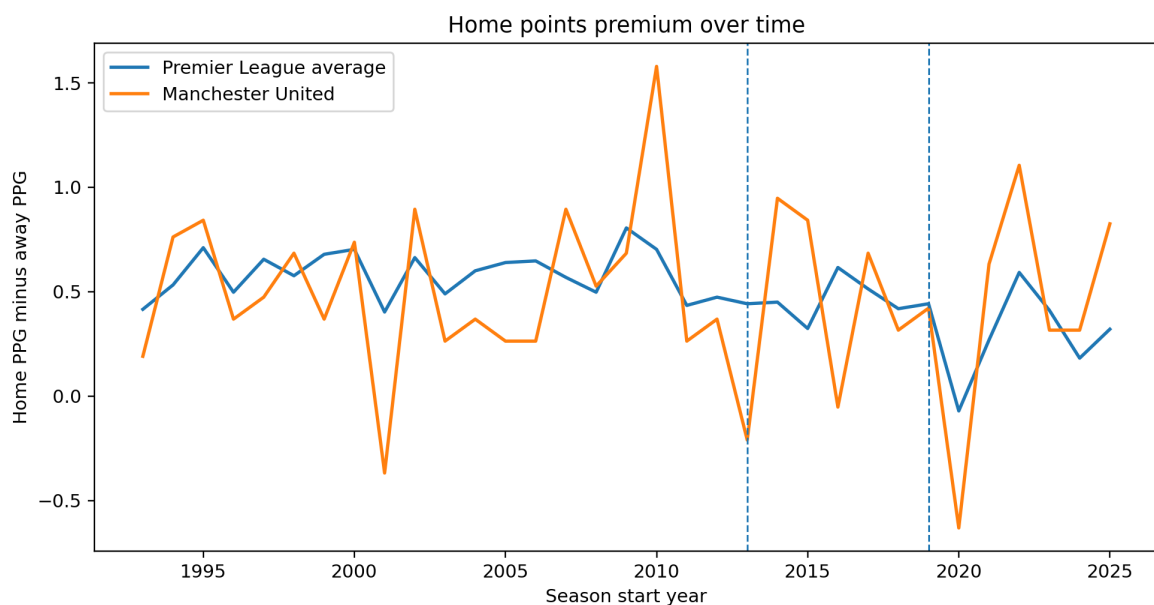


Figure 1: Manchester United and Premier League home points premium over time.

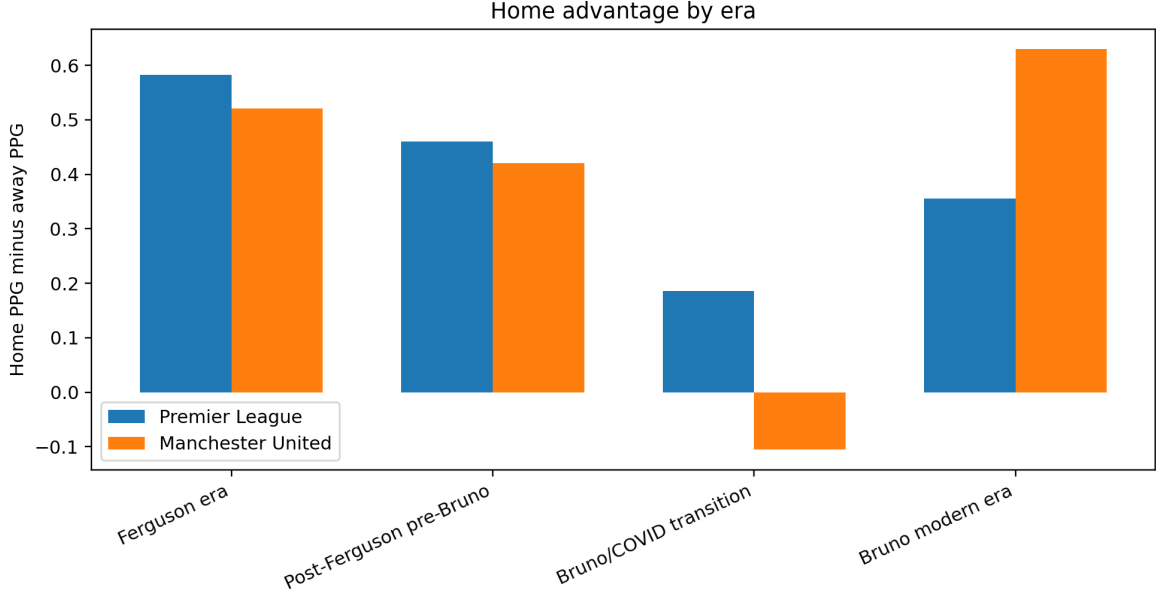


Figure 2: Home points premium by era: Manchester United versus Premier League average.

4.2 Interpreting the descriptive patterns

The descriptive evidence suggests three preliminary facts. First, home advantage is persistent at the league level but smaller in the modern era than in the early Premier League period. Second, Manchester United’s Ferguson-era dominance is not fully captured by a home-minus-away premium because the club was also exceptional away from home. Third, the modern Bruno era shows a renewed Old Trafford premium, but this could reflect either improved home performance, weaker away performance, or both. The econometric model below is designed to separate league-wide home advantage from the Manchester United-specific increment.

5 Econometric Strategy

5.1 Estimand and interpretation

The object of interest is a *home performance premium*, not a causal estimate of the stadium atmosphere alone. A home premium combines several mechanisms: crowd support, venue familiarity, travel costs, referee behavior, tactical choices, and psychological comfort. The empirical question is therefore comparative: does Manchester United’s home premium differ from the Premier League benchmark, and does that difference change across eras?

For team i in match m and season s , let the observed outcome be $Y_{i,m,s}$, where Y is alternatively points, goal difference, or a win indicator. The team-match construction

means that each fixture generates two observations, one from the home team’s perspective and one from the away team’s perspective. This symmetric construction is useful because the coefficient on the home indicator is directly interpretable as the average within-season difference between playing at home and away.

The most important distinction is between absolute home strength and relative home advantage. Manchester United can have a very high home points-per-match level without having an unusually large home premium if their away performance is also strong. The model therefore estimates a differential:

$$HA_{MU,e} - HA_{PL,e}, \quad (10)$$

where $HA_{MU,e}$ is Manchester United’s home-away performance gap in era e and $HA_{PL,e}$ is the Premier League average home-away gap in the same era.

5.2 Preferred fixed-effects model

The preferred baseline specification is:

$$Y_{i,m,s} = \beta Home_{i,m,s} + \delta(Home_{i,m,s} \times MU_i) + \eta_{i,s} + \epsilon_{i,m,s}. \quad (11)$$

Here $Home_{i,m,s}$ equals one if team i plays match m at home, MU_i equals one for Manchester United, and $\eta_{i,s}$ is a team-season fixed effect. The team-season fixed effect is the key robustness improvement. It absorbs all club-level characteristics in a given season: squad quality, manager, ownership environment, injuries at the season level, club form, and season-specific team strength. Identification comes only from comparing a club’s home matches to its away matches within the same season.

In equation (11), β is the Premier League home premium and δ is Manchester United’s additional home premium relative to the league benchmark. The implied Manchester United home premium is:

$$HA_{MU} = \beta + \delta. \quad (12)$$

A positive δ means that Old Trafford is associated with a larger home premium than the average Premier League venue. A zero δ means that United’s home-away differential is not statistically different from the league’s home-away differential. A negative δ means that United’s home-away differential is smaller than the league benchmark.

5.3 Era-interaction model

The preferred era specification allows both the Premier League home premium and Manchester United’s additional premium to vary by era:

$$Y_{i,m,s} = \sum_e \beta_e (Home_{i,m,s} \times Era_{e,s}) + \sum_e \delta_e (Home_{i,m,s} \times MU_i \times Era_{e,s}) + \eta_{i,s} + \epsilon_{i,m,s}. \quad (13)$$

The coefficient β_e is the Premier League home premium in era e . The coefficient δ_e is Manchester United’s additional Old Trafford premium in that same era. The implied total Manchester United home premium in era e is therefore:

$$HA_{MU,e} = \beta_e + \delta_e. \quad (14)$$

This specification is stronger than a simple before-and-after comparison because it benchmarks United against the league environment in the same period. It also avoids treating the Ferguson era, the post-Ferguson era, the COVID transition, and the modern Bruno era as if they came from a single stable regime.

5.4 Inference

The main standard errors are clustered at the club level:

$$\widehat{Var}(\hat{\theta}) = (X'X)^{-1} \left(\sum_{c=1}^C X'_c \hat{u}_c \hat{u}'_c X_c \right) (X'X)^{-1}, \quad (15)$$

where c indexes clubs. Club-level clustering is appropriate because team performance is serially correlated across matches and seasons. The paper also treats the Bruno layer separately because it uses a much smaller season-level sample. In that section, statistical significance is less informative than the sign, magnitude, and football interpretation of the coefficient.

5.5 Bruno exploratory model

The Bruno layer estimates exploratory season-level regressions of the form:

$$Z_s = \alpha + \rho KP90_s + \nu_s, \quad (16)$$

where Z_s is Manchester United’s attacking output in season s , such as shots per match, goals per match, shots on target per match, or points per match. $KP90_s$ is Bruno Fernandes’

key passes per 90 minutes. Because there are only six observations, ρ is interpreted as a descriptive association rather than a causal estimate.

6 Results: Is Old Trafford Still a Fortress?

6.1 Baseline results

Table 2 reports the preferred team-season fixed-effects model. The Premier League home premium is large and statistically significant across all three outcomes. Playing at home is associated with approximately 0.505 additional points, 0.726 additional goals in goal difference, and a 16.7 percentage-point increase in win probability.

Manchester United’s full-sample additional home-points premium is not statistically significant. The coefficient is -0.024 points with a standard error of 0.020. This is not evidence that Old Trafford was weak. It means that, after comparing United’s own home and away matches within each season and benchmarking that gap against the league, United’s home-away points differential is not larger than the average Premier League home-away differential over the whole sample. For goal difference, however, United’s additional home effect is positive and statistically significant at the 5 percent level. The win-probability interaction is also positive and significant at the 5 percent level, although its magnitude is modest.

Table 2: Preferred baseline home-advantage regressions

	Points	Goal difference	Win probability
Premier League home premium	0.505***(0.020)	0.726***(0.027)	0.167***(0.008)
Man United additional home premium	-0.024 (0.020)	0.065** (0.027)	0.015** (0.008)
Team-season fixed effects	Yes	Yes	Yes
Club-clustered s.e.	Club	Club	Club
Observations	25,266	25,266	25,266

Notes: Standard errors clustered by club in parentheses. Team-season fixed effects included. The Manchester United coefficient is the additional home premium relative to the Premier League benchmark. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

6.2 Era-specific results

Table 3 presents the preferred era-interaction model. The Premier League home points premium declines from 0.586 points in the Ferguson era to 0.463 points in the post-Ferguson pre-Bruno period. It falls further during the Bruno/COVID transition to 0.201 points, before recovering to 0.342 points in the Bruno modern era through the March 2026 cutoff. This pattern is consistent with the broader literature on the erosion of home advantage during COVID and the partial restoration of home advantage after fans returned.

Manchester United’s additional home premium varies substantially by era. During the Ferguson era, the additional points premium is negative (-0.065) and statistically significant, while the additional goal-difference premium is positive (+0.071) and statistically significant. This combination is important: Ferguson-era United did not have a bigger points gap than the league because their away points were also very high, but their home goal-difference edge was still above the league benchmark.

The post-Ferguson pre-Bruno period is weaker. United’s additional points premium is not statistically significant, while the additional goal-difference premium is negative and marginally significant. The Bruno/COVID transition is clearly negative across outcomes, which is consistent with the disruption of empty-stadium and pandemic football. In the Bruno modern era, however, United’s additional home premium turns positive and statistically significant: +0.289 points, +0.343 goals in goal difference, and +12.2 percentage points in win probability relative to the league home benchmark.

Using equation (14), the implied Manchester United home-points premium in the modern Bruno era is approximately $0.342 + 0.289 = 0.631$ points per match. This is the strongest evidence in the paper that Old Trafford has recovered part of its relative home advantage in the most recent period.

Table 3: Preferred era-specific home-advantage regressions

Era	Points		Goal difference		Win probability	
	PL home	MU extra	PL home	MU extra	PL home	MU extra
Ferguson era	0.586*** (0.022)	-0.065*** (0.022)	0.820*** (0.028)	0.071** (0.028)	0.194*** (0.009)	0.009 (0.009)
Post-Ferguson pre-Bruno	0.463*** (0.038)	-0.042 (0.038)	0.718*** (0.055)	-0.104* (0.055)	0.154*** (0.013)	-0.014 (0.013)
Bruno/COVID transition	0.201*** (0.044)	-0.306*** (0.044)	0.328*** (0.061)	-0.144** (0.061)	0.066*** (0.019)	-0.093*** (0.019)
Bruno modern era	0.342*** (0.032)	0.289*** (0.032)	0.503*** (0.054)	0.343*** (0.054)	0.113*** (0.013)	0.122*** (0.013)
Team-season fixed effects	Yes					
Clustered s.e.	Club					

Notes: Standard errors clustered by club in parentheses. Team-season fixed effects included. PL home is the league-wide home effect in each era. MU extra is Manchester United’s additional home effect relative to the league benchmark. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

6.3 Interpretation

The results imply that the answer to the title question is conditional. If “fortress” means simply that Manchester United perform better at home than away, then Old Trafford remains important in several periods, especially the Ferguson era and the modern Bruno era. If “fortress” means that United’s home advantage is uniquely larger than the Premier League average, then the evidence is more nuanced. The Ferguson-era points premium is not uniquely large because United were also exceptionally strong away from home. The post-Ferguson period shows erosion. The modern Bruno era shows renewed relative home strength.

This interpretation avoids a common mistake in football narratives: confusing home level with home differential. A dominant team can have an extraordinary home record and yet a modest home-away differential if its away record is also elite. Conversely, a side that is fragile away from home can show a large home premium even if its absolute home level is not historically dominant. For this reason, the paper treats the Old Trafford premium as a differential measure, not simply a ranking of home performance.

7 Chapter 4: From Fortress to Focal Point - The Bruno Fernandes Creativity Layer

7.1 Motivation

The home-advantage analysis measures a place-based performance premium. The Bruno layer asks a different but related question: in the modern period, is Manchester United’s attacking production increasingly concentrated through a player-centered creative focal point?

Bruno Fernandes is analytically useful because his role is visible in chance creation. Key passes are not a complete measure of creativity, but they capture a player’s direct involvement in generating shots for teammates. A player who accumulates high key-pass volume across seasons is not simply benefiting from finishing variance; he is repeatedly creating shooting opportunities.

7.2 Bruno’s season-level creative output

Table 4 presents Bruno’s key passes and Manchester United’s attacking output by Premier League season. The numbers show sustained high-volume creation. Bruno recorded 83 key passes in 2020/21, 109 in 2022/23, and 105 in 2023/24. The 2019/20 observation is partial because he joined in January 2020, and the incomplete 2025/26 player season is excluded from this completed-season comparison.

Table 4: Bruno Fernandes key passes and Manchester United output

Season	Key passes	KP/90	Assists	United shots/match	United PPG
2019/20	23	1.74	7	14.29	1.74
2020/21	83	2.41	12	13.71	1.95
2021/22	79	2.29	6	13.37	1.53
2022/23	109	2.96	8	15.58	1.97
2023/24	105	3.03	8	14.47	1.58
2024/25	81	2.42	10	13.87	1.11

Notes: Bruno key-pass data are season-level Premier League figures. The 2019/20 observation is partial because Fernandes joined Manchester United in January 2020. United shots per match and points per match are constructed from the match-level Premier League panel.

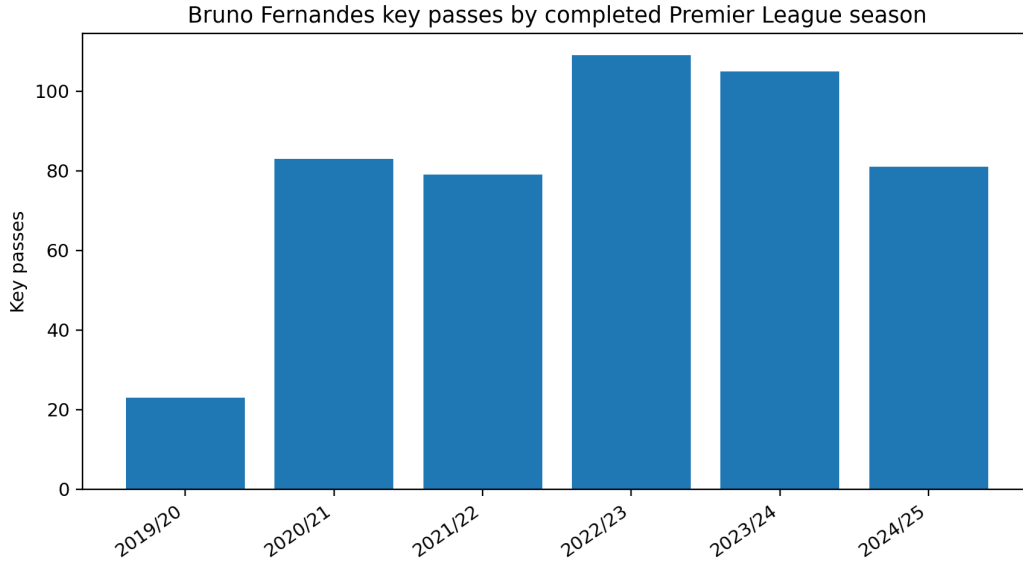


Figure 3: Bruno Fernandes key passes by Premier League season.

7.3 Exploratory relationship with United attacking output

Figure 4 plots Bruno’s key passes per 90 against Manchester United’s shots per match. The relationship is positive. In the simple exploratory regression, one additional Bruno key pass per 90 is associated with approximately 0.85 additional Manchester United shots per match. The estimate is positive but imprecise and is not conventionally significant in the six-observation sample. The relationship with goals, shots on target, and points is weaker.

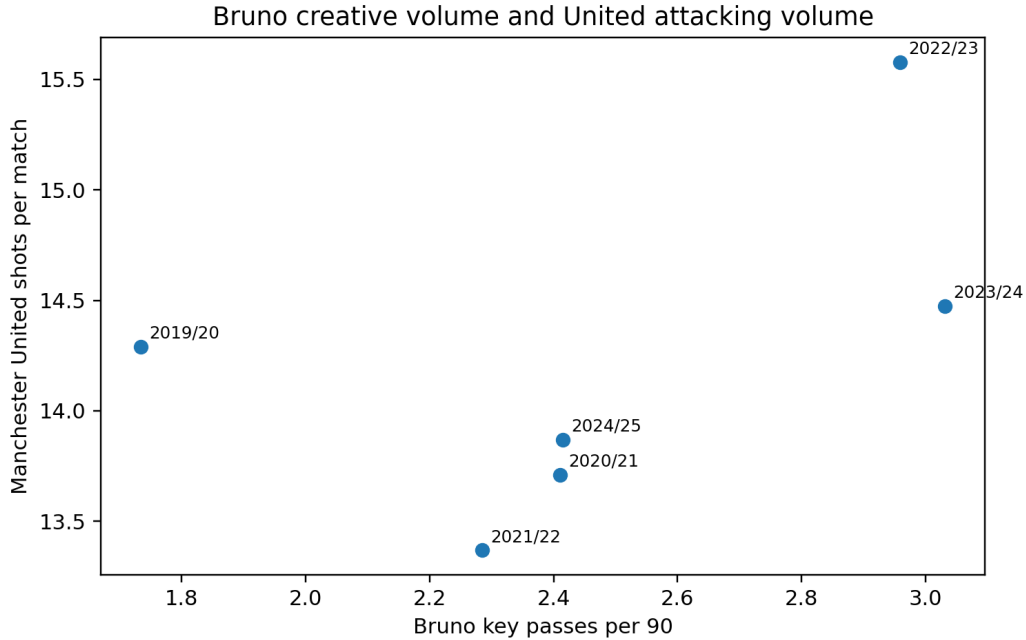


Figure 4: Bruno key passes per 90 and Manchester United shots per match.

The interpretation is straightforward: Bruno’s creative volume appears more closely connected to shot generation than to final outcomes. This is consistent with football logic. A creator can increase the number of attacking opportunities, but goals and points require finishing, defensive performance, game state, and match context. In this sense, the Bruno layer reinforces the paper’s broader theme: modern United may possess strong individual creative channels, but translating those channels into durable institutional advantage requires more than one player.

7.4 From Old Trafford to Bruno Fernandes

The Bruno layer should not be read as evidence that Bruno caused the modern Old Trafford premium. Instead, it suggests a broader narrative. During the Ferguson era, Manchester United’s advantage was institutional and system-wide. In the post-Ferguson period, that advantage weakened. In the modern era, United’s home performance has improved relative to the league, while attacking production appears to rely heavily on a central creative player. The move from fortress to focal point is therefore not a replacement story, but a change in the composition of advantage.

8 Robustness and Limitations

8.1 Academic robustness assessment

The final specification is deliberately more conservative than a simple pooled model. The most important robustness choice is the inclusion of team-season fixed effects. This means that the estimates do not compare Manchester United to weaker or stronger clubs in levels. Instead, they compare each club to itself within a season and ask whether the home-away difference is larger for Manchester United than for the league benchmark.

The model is also estimated on three outcomes: points, goal difference, and win probability. This matters because each outcome answers a different question. Points are the league currency but are discrete and noisy. Goal difference is a stronger performance-margin measure. Win probability is intuitive but loses information from draws and margins. The main conclusion is strongest when points and goal difference move together. In the modern Bruno era, both do: United’s additional home premium is positive for points and goal difference.

A further robustness check excludes the COVID-disrupted 2019/20 and 2020/21 seasons. Table 5 shows that the league-wide home premium remains strongly positive, while United’s full-sample additional points premium remains statistically indistinguishable from zero. United’s additional goal-difference and win-probability premiums remain positive. This supports the paper’s central interpretation: the full-sample Old Trafford effect is not primarily a points-premium story, but there is evidence of a stronger United home margin and win effect relative to the league benchmark.

Table 5: Robustness check excluding COVID-disrupted seasons

	Points	Goal difference	Win probability
Premier League home premium	0.524***(0.020)	0.752***(0.027)	0.174***(0.008)
Man United additional home premium	-0.006 (0.020)	0.079***(0.027)	0.022***(0.008)
COVID seasons excluded	Yes	Yes	Yes
Team-season fixed effects	Yes	Yes	Yes

Notes: Seasons 2019/20 and 2020/21 are excluded. Standard errors clustered by club in parentheses. Team-season fixed effects included. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

8.2 Mathematical interpretation of the preferred model

The preferred era model can be read as a decomposition:

$$\underbrace{HA_{MU,e}}_{\text{United total home premium}} = \underbrace{\beta_e}_{\text{Premier League home premium}} + \underbrace{\delta_e}_{\text{United additional premium}}. \quad (17)$$

This decomposition is the mathematical core of the paper. The empirical question is not whether $HA_{MU,e} > 0$; in most eras it is. The stronger question is whether $\delta_e > 0$, meaning United’s home premium exceeds the league benchmark. This distinction is why the Ferguson era produces a subtle result: United were clearly dominant at Old Trafford, but their away dominance compresses the home-away points differential.

8.3 Limitations

Three limitations remain. First, the analysis is not a causal estimate of crowd effects. The home indicator captures crowd support, travel, venue familiarity, tactics, officiating, and other unobserved mechanisms. Second, the era definitions are historically motivated rather than randomly assigned. The post-Ferguson period, COVID period, and Bruno era combine changes in managers, squad quality, injuries, ownership conditions, and league competition. Third, the Bruno layer is intentionally exploratory. It uses six season-level observations and one creativity proxy. A stronger future version would use match-level player data, expected assists, shot-creating actions, progressive passes, and on/off or availability models.

A possible match-level Bruno specification would be:

$$xG_{MU,m} = \alpha + \rho BrunoCreativity_m + \psi Home_m + \omega OpponentStrength_m + \lambda_s + \epsilon_m, \quad (18)$$

where $BrunoCreativity_m$ could include key passes, expected assists, shot-creating actions, progressive passes, and passes into the penalty area. Such a model would better separate Bruno’s creative contribution from broader team and opponent context.

9 Conclusion

This paper asked whether Old Trafford is still a fortress. The answer is not a simple yes or no. Across the Premier League era, home advantage remains large and statistically significant. Manchester United’s full-sample additional home-points premium is not statistically different from the league benchmark, partly because Ferguson-era United were also dominant away from home. The post-Ferguson period shows evidence of erosion, especially in goal-difference terms. The modern Bruno era, however, shows a renewed relative home advantage: United’s

additional home premium becomes positive and statistically significant for points, goal difference, and win probability.

The Bruno Fernandes inner layer adds a player-centered interpretation. Bruno's creative output is strongly visible in key-pass volume and is positively but imprecisely associated with United shot volume, though not reliably with goals or points in a six-observation season-level sample. That distinction matters. Creativity creates attacking conditions; it does not guarantee conversion. A team can depend on a creator and still struggle to transform chance generation into stable results.

The central conclusion is that Manchester United's advantage has changed in form. Old Trafford has not disappeared as a performance factor, but the meaning of the fortress has shifted. In the Ferguson era, the fortress was part of a wider institutional machine. In the post-Ferguson period, that machine weakened. In the modern era, Old Trafford's relative premium has recovered, while the team's attacking identity appears increasingly organized around a creative focal point. The modern question is therefore not only whether Old Trafford is still a fortress. It is whether Manchester United can combine place-based advantage with a less concentrated, more durable attacking structure.

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A Additional Regression Notes

The preferred regressions use team-season fixed effects and club-clustered standard errors. The team-match panel includes both home and away observations for each Premier League match. This doubles the number of observations relative to raw fixtures but ensures that each club’s perspective is represented symmetrically. Team-season fixed effects absorb each club’s season-level strength, leaving identification from within-club, within-season home-away differences.

The estimated coefficient δ_e in equation (13) should be interpreted as a relative home premium, not as absolute home strength. For example, a negative Ferguson-era points interaction does not imply that Manchester United were weak at Old Trafford. It means their home-away points gap was not larger than the league-wide home-away points gap in that era. Their absolute home points were still very high.

B Variable Definitions

Variable	Definition
$Points_{i,m}$	Three points for a win, one point for a draw, zero points for a loss.
$GD_{i,m}$	Goals scored minus goals conceded.
$Win_{i,m}$	Indicator equal to one if goals scored exceed goals conceded.
$Home_{i,m}$	Indicator equal to one if team i is the home team in match m .
MU_i	Indicator equal to one for Manchester United.
$Era_{e,s}$	Indicator equal to one if season s belongs to era e .
$KP90_s$	Bruno Fernandes key passes per 90 minutes in season s .