

# Are fans a factor of home advantage?

## The results of the pandemics live experiment in the main European football leagues

*This paper raises the question of fan support as a factor of home advantage, based on the results of the live experiment triggered by the 2020 pandemics in main European football leagues. Comparing the results of matches before the pandemics (with fans at the stadiums) and after the pandemics (without fans at the stadiums), we find that home advantage decreased in average as expected, but several puzzling exceptions are uncovered.*

### Introduction

Playing home is traditionally considered an advantage in team sports; and the presence of fans in playing facilities is traditionally considered a factor of such an advantage. This is explicitly admitted in the organization of competitions, as playing away from home facilities or the absence of fans is often established as a penalty in regulations and playing home is often established as a reward in the same regulations (v. g. in play-off decisions).

The advantage of playing home has been the subject of scholar studies since Schwartz and Barsky (1977), which confirmed the existence of home advantage in team sports and identified social support of the home audience as its main factor. This was later supported by various papers, as Marek and Vávra (2020) for the first topic, and Moskowitz and Wertheim (2011) for the second aspect.

The 2020 covid19 pandemics presented the opportunity to test the importance of fan presence in playing facilities, as many competitions were suspended because of the pandemics and resumed after some time with matches without fans. Dilger and Vischer (2022) is an example of an inquiry into the consequences of such live experiment in the case of the main German football league, which concludes for a clear reduction of home advantage in these circumstances.

In this paper, the quantitative importance of home advantage before the pandemics with fans and after the pandemics without fans is compared in the 2019-2020 season of the main European football leagues. The experiment is significant because matches with fans and matches without fans were randomly selected beforehand without knowledge of the experiment the pandemics would trigger, and squads did not significantly change (as most changes during the season are concentrated in the so-called January market, which unfolded unaware of what was to come).

According to the UEFA rankings, the top European football leagues, which selected at least two teams to the Europe Champions League of the following 2020-2021 season were those of Spain, England, Germany, Italy, France, Russia, Portugal, Belgium, Ukraine, Turkey, Netherlands, Austria,

Czechia, Greece and Croatia. France, Belgium and the Netherlands did not resume their leagues after the pandemics; Spain, England, Germany, Italy, Portugal, Turkey, Austria, Greece and Croatia resumed their leagues without fans at the stadiums; Russia and Ukraine resumed their leagues with significant restrictions on fan numbers at the stadiums; Czechia resumed its league without restrictions; in Russia and Ukraine several matches were not played because of covid spurts in some teams; in Czechia the league was not concluded for the same reason.

## Methodology

The following ratio is taken as an indicator of the degree of home advantage

indicator of home advantage =  

$$= (\text{number of home wins} - \text{number of home defeats}) / \text{total number of matches}$$

that is to say, the degree of home advantage is measured by the excess of home wins over home defeats as a percentage of the total number of matches played.

Of course, (expected) positive figures indicate there is an effective home advantage (home wins exceed home defeats), (unexpected) null figures indicate absence of home advantage (home wins equal home defeats), and (even more unexpected) negative figures indicate home disadvantage (home defeats exceed home wins); the indicator may vary between +1 (complete home advantage, as the home teams win all matches) and -1 (complete home disadvantage, as the home teams lose all matches).

## Aggregate Results

The following table presents the pooled figures for the fifteen European football leagues mentioned above.

**Table 1.** Home advantage in the main fifteen European football leagues in the 2019-2020 season

aggregate results period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	1435	45	773	25	961	30	3169
after pandemics mostly without fans *	387	41	232	25	315	34	934
total	1822	44	1005	25	1276	31	4103

Source – Computed from official results

\* Russia and Ukraine included; Czechia excluded.

The aggregate results fit quite well the expectations: significant home advantage before the pandemics (+15 per cent); relative decrease of home wins and increase of home defeats when fans were absent from stadiums, leading to a decrease of home advantage (to +7 per cent).

However, detailed consideration of national cases presents some puzzling features.

## Spain

The following table presents the figures for the Spanish football league.

**Table 2.** *Home advantage in the Spanish football league in the 2019-2020 season*

Spanish league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	129	48	75	28	66	24	270
after pandemics without fans	45	41	30	27	35	32	110
total	174	46	105	28	101	26	380

Source – Computed from official results

The home advantage in the Spanish league was clearly higher than the average before the pandemics (+24 per cent) and decreased significantly when fans were absent from stadiums (to +9 per cent), as both home wins decreased and home defeats increased in relative terms (draw results remaining roughly the same). Thus, it may be said the Spanish league presents the expected feature.

## England

The following table presents the figures for the English football league.

**Table 3.** *Home advantage in the English football league in the 2019-2020 season*

English league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	129	45	72	25	87	30	288
after pandemics without fans	43	47	20	22	29	31	92
total	172	45	92	24	116	31	380

Source – Computed from official results

The home advantage in the English league was similar to the average before the pandemics (+15 per cent) and slightly increased when fans were

absent from stadiums (to +16 per cent), as both home wins and home defeats slightly increased in relative terms (and draw results decreased). Thus, it may be said the English league does not present the expected feature, as home advantage almost did not change with the absence of fans.

## Germany

The following table presents the figures for the German football league.

**Table 4.** *Home advantage in the German football league in the 2019-2020 season*

German league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	97	43	49	22	78	35	224
after pandemics without fans	26	32	19	23	37	45	82
total	123	40	68	22	115	38	306

Source – Computed from official results

The home advantage in the German league was clear but lower than the average before the pandemics (+8 per cent). The decrease of home wins and the increase of home defeats in relative terms (draw results remaining roughly the same) when fans were absent from stadiums generated a home disadvantage even clearer than the previous home advantage (-13 per cent). Thus, it may be said the German league presents another puzzling feature (however, contrary to England and according to expectations, home performance does worsen without fans). (Dilger and Vischer (2022), already referred above, presents a more detailed analysis of the German league on this regard.)

## Italy

The following table presents the figures for the Italian football league.

**Table 5.** *Home advantage in the Italian football league in the 2019-2020 season*

Italian league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	103	40	58	23	95	37	256
after pandemics without fans	55	44	27	22	42	34	124
total	158	42	85	22	137	36	380

Source – Computed from official results

The home advantage in the Italian league was quite low before the pandemics (+3 per cent). When fans were absent from stadiums, there was a

relative increase of home wins and decrease of home defeats (draw results remaining roughly the same) leading to an increase of home advantage (to +10 per cent). Thus, it may be said the Italian league clearly contradicts the expected feature, as home performance improved in the absence of fans.

## France

The following table presents the figures for the French football league.

**Table 6.** *Home advantage in the French football league in the 2019-2020 season*

French league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	134	48	70	25	75	27	279
after pandemics without fans	0	0	0	0	0	0	0
total	134	48	70	25	75	27	279

Source – Computed from official results

The home advantage in the French league was clearly higher than the average before the pandemics (+21 per cent). As pointed out above, the French league was not resumed after the pandemics.

## Russia

The following table presents the figures for the Russian football league.

**Table 7.** *Home advantage in the Russian football league in the 2019-2020 season*

Russian league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	65	37	47	27	64	36	176
after pandemics with less fans	20	33	16	27	24	40	60
total	85	36	63	27	88	37	236

Source – Computed from official results

The home advantage in the Russian league was almost imperceptible before the pandemics (+1 per cent). As in the case of Germany already mentioned, the decrease of home wins and the increase of home defeats in relative terms when fan presence in stadiums was restricted generated a home disadvantage even clearer than the previous home advantage (-7 per cent).

## Portugal

The following table presents the figures for the Portuguese football league.

**Table 8.** *Home advantage in the Portuguese football league in the 2019-2020 season*

Portuguese league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	84	40	53	26	70	34	207
after pandemics without fans	45	46	24	24	30	30	99
total	129	42	77	25	100	33	306

Source – Computed from official results

The Portuguese league presents an amplified version of the Italian situation: low home advantage before the pandemics (+4 per cent); significant relative increase of home wins and decrease of home defeats when fans were absent from stadiums leading to a significant increase of home advantage without fans (to +16 per cent).

## Belgium

The following table presents the figures for the Belgian football league.

**Table 9.** *Home advantage in the Belgian football league in the 2019-2020 season*

Belgian league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	111	48	50	22	69	30	230
after pandemics without fans	0	—	0	—	0	—	0
total	111	48	50	22	69	30	230

Source – Computed from official results

Belgium presents a picture quite similar to France in all regards: the home advantage was clearly higher than the average before the pandemics (+18 per cent); the Belgian league was not resumed after the pandemics.

## Ukraine

The following table presents the figures for the Ukrainian football league.

**Table 10.** *Home advantage in the Ukrainian football league in the 2019-2020 season*

Ukrainian league period	home wins		draws *		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	62	45	26	19	50	36	138
after pandemics with less fans	21	43	12	24	16	33	49
total	83	45	38	20	66	35	187

Source – Computed from official results

\* 1 (play-off after the pandemic) draw was untied as home win in extra time.

The home advantage in the Ukrainian league was lower than the average before the pandemics (+9 per cent); both home wins and home defeats decreased in relative terms after the pandemics (with a clear increase of draw results), but the indicator of home advantage did not change significantly (it slightly increased to +10 per cent). Once more, the expected feature is not found.

## Turkey

The following table presents the figures for the Turkish football league.

**Table 11.** *Home advantage in the Turkish football league in the 2019-2020 season*

Turkish league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	101	43	65	28	68	29	234
after pandemics without fans	33	46	19	26	20	28	72
total	134	44	87	27	88	29	306

Source – Computed from official results

Turkey is another case of increase of home advantage when fans were absent from stadiums: the home advantage in the Turkish league was clear and near the average before the pandemics (+14 per cent) and increased (to +18 per cent) after the pandemics, as a result of an increase of home wins and a slight decrease of home defeats in relative terms.

## Netherlands

The following table presents the figures for the Dutch football league.

**Table 12.** *Home advantage in the Dutch football league in the 2019-2020 season*

Dutch league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	120	52	49	21	63	27	232
after pandemics without fans	0	—	0	—	0	—	0
total	120	52	49	21	63	27	232

Source – Computed from official results

The situation in the Dutch league is quite similar to the situation in the French and Belgian ones: the home advantage was clearly higher than the average before the pandemics (+25 per cent); the league was not resumed after the pandemics.

### Austria

The following table presents the figures for the Austrian football league.

**Table 13.** *Home advantage in the Austrian football league in the 2019-2020 season*

Austrian league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	47	36	33	25	52	39	132
after pandemics without fans	19	32	12	20	29	48	60
total	66	34	45	23	81	42	192

Source – Computed from official results

Austria is an extreme (and very surprising) version of what happened in Germany and Russia: home disadvantage before the pandemics (-3 per cent); less home wins and much more home defeats (also less draws) in relative terms after the pandemics, increasing home disadvantage (to -16 per cent).

### Czechia

The following table presents the figures for the Czech football league.

**Table 14.** *Home advantage in the Czech football league in the 2019-2020 season*

Czech league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	96	50	47	25	48	25	191



Czech league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
after pandemics with fans	39	50	18	23	21	27	78
total	135	50	65	24	69	26	269

Source – Computed from official results

Home advantage in the Czech league was quite above the average before the pandemics (+25 per cent); the league was resumed with fans and the percentages of home wins, draws and home defeats, and consequently the indicator of home advantage (now +23 per cent), did not significantly change after the pandemics as could be expected.

## Greece

The following table presents the figures for the Greek football league.

**Table 15.** *Home advantage in the Greek football league in the 2019-2020 season*

Greek league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	88	48	48	27	46	25	182
after pandemics without fans	19	33	23	40	16	27	58
total	107	44	71	30	62	26	240

Source – Computed from official results

Greece is another case that agrees with expectations: quite high home advantage before the pandemics (+23 per cent); important decrease of home wins and small increase of home defeats (also important increase in draw results) in relative terms after the pandemics resulting in a significantly reduced home advantage (+6 per cent).

## Croatia

The following table presents the figures for the Croatian football league.

**Table 16.** *Home advantage in the Croatian football league in the 2019-2020 season*

Croatian league period	home wins		draws		home defeats		total
	no.	%	no.	%	no.	%	no.
before pandemics with fans	69	53	31	24	30	23	130
after pandemics without fans	22	44	12	24	16	36	50
total	91	50	43	24	46	26	180

Source – Computed from official results

Croatia also fulfils expectations: quite high home advantage before the pandemics (+20 per cent); relative decrease of home wins and increase of home defeats (draws remaining roughly the same) after the pandemics resulting in a significantly reduced home advantage (+8 per cent).

## Concluding Remarks

As pointed out above, the aggregate results coincide with what was expected: significant home advantage before the pandemics with fans; significant reduction of home advantage after the pandemics without (or with less) fans.

Some countries present the same picture: it is the case of Spain, Greece and Croatia, which start with home advantage above the average before the pandemics and witness a significant reduction of home advantage after the pandemics. It is possible to speculate that France, Belgium and the Netherlands would fit the same pattern if their leagues had been resumed. It is also possible to say that Czechia, which resumed the league with fans, fulfils the expected feature, as home advantage did not significantly change after the pandemics.

However, nearly half of the leagues considered do not fulfil the expected pattern (and in quite different ways).

On one side, there is the pattern of Germany, Russia and Austria, which involves very low home advantage (and even home disadvantage in the case of Austria) before the pandemics and home disadvantage after the pandemics. Anyway, the situation worsens for home teams without fans.

England and Turkey, which had home advantage close to the average before the pandemics, do not fulfil expectations because they witnessed slight increases of home advantage after the pandemics. The same is true in Ukraine, although home advantage was rather lower than average before the pandemics.

Clearly against the pattern of decreased home advantage without fans are the cases of Italy and Portugal. Both had low home advantage before the pandemics and witnessed significantly better results of home teams after fans disappeared from stadiums.

Of course, these somewhat heterogeneous patterns call for an extended analysis of what may be the explanations for such puzzling features. Anyway, it is clear that fan support in playing facilities cannot be taken as a certain factor of home advantage; and even home advantage, although present in the majority of cases, cannot be taken as granted.

**References**

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